

# Noboken School Forest Education Plan

Unified School District of Antigo

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Wisconsin Environmental Education Board.

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# Rationale

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## Value statement

The school forest is an incredible education resource that provides the opportunity to enhance classroom instruction through experiential outdoor education, integrates environmental education into the curriculum and demonstrates sustainable natural resource management. Tying curricular content areas together through environmental education is an effective method to meet a variety of state standards, increase student achievement and create environmentally literate citizens. A study completed by Staley (1979) determined that outdoor education has many benefits that include: 1) developing children's knowledge and appreciation of their environment and man's relationship to the environment, 2) developing children's understanding, skills and appreciation needed to lead productive, creative and enjoyable lives, 3) developing children's problem solving and decision making skill, 4) improving children's self-worth and personal achievement, 5) developing children's skills in cooperation and teamwork, and 6) developing the creative potentials within each child. In addition, Sivek (2002) completed a study analyzing environmental sensitivity among Wisconsin high school students. Sivek states that environmental sensitivity is a pre-cursor to environmental literacy. The majority of high school students cited that time spent outdoors was the most important influence among those that develop environmental sensitivity.

## Target messages

1. Our environment provides aesthetic, cultural, ecological, economic, educational, recreational and social values necessary for survival and a good quality of life.
2. All human activities, past, present and future, impact the environment.
3. The diverse natural world has a distinct nonhuman value.
4. Humans have an obligation to be good environmental stewards for the current and future health of the land and of humans.

## Needs assessment results

During the spring of 2004, the school forest committee surveyed the teaching staff of the Unified School District of Antigo. Conclusions were drawn in the areas of Interest/Awareness and Barriers.

### Interest/Awareness

- Only a few of the 180 district teachers have used to school forest in the past and even fewer continue to use it today.
- Many teachers, especially newer teachers to the district, are unaware that the school forest even exists. Many of those that are aware of it, do not have any familiarity with the facilities and other resources available at the site.
- Over half of the teachers responding said they are interested in using the school forest.
- Most teachers are infusing some environmental education into their classes, but do not use or are unaware of a specific environmental education curriculum for the district.
- Most teachers would feel more comfortable using the school forest if they had some assistance in planning and implementing lessons.

### Barriers

Based on the survey results, the following are seen as barriers to increased use of the school forest:

- Many district staff are not aware of the existing school forest, its location and/or the resources at the site.
- Time constraints due to scheduling, especially at the high school and middle school level, prevent some teachers from using the school forest.
- Transportation costs and travel time (the school forest is located 12 miles from Antigo) inhibit teachers from utilizing the site.
- The lack of a developed EE curriculum and/or school forest program has resulted in the lack of direction for using the school forest to meet curriculum needs.

Antigo students have the educational advantage of a school forest. However, very few have had the opportunity to utilize this magnificent resource. The district does not have a high quality interdisciplinary EE

curriculum. Therefore, students do not meet the goals of EE (awareness, knowledge, attitudes/environmental ethic, citizen action skills, and citizen action experience). The district also does not address WI Model Academic Standards for EE.

Antigo teachers lack training, resources, guidance and information to implement outdoor, hands-on education at the school forest site.

Community members are in need of opportunities to increase their environmental awareness, knowledge, concern about environmental issues, and participation in their child's education.

# Site Description and Opportunities

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## Site description and location

### Overview:

The school district acquired the 168-acre site and registered it as a school forest in 1931. The site is divided into two sections north and south of County Hwy J. The original land cover of the area was comprised of upland mixed deciduous/coniferous forest vegetation. Due to intensive logging activities in the early 1900's, the property now has several different natural habitat types including a tamarack swamp, a small pond and a 27-acre seepage lake (Noboken Lake). Noboken Lake's deepest point is 52 feet. There are several large floating bogs and numerous species of fish and plants available for study. The Noboken School Forest is approximately 12 miles north of Antigo.

### Legal description:

- Section 16, T33N, R11E, SW  $\frac{1}{4}$  of SW  $\frac{1}{4}$
- Section 17, T33N, R11E, SE  $\frac{1}{4}$  of SE  $\frac{1}{4}$
- Section 20, T33N, R11E, Government Lot 1
- Section 21, T33N, R11E, NW  $\frac{1}{4}$  of NW  $\frac{1}{4}$

### Directions:

Go 12 miles north of Antigo on State Hwy. 45. Turn right (east) on Cty. Hwy. J.

Option 1: to cabin - travel about 300 yards on Hwy. J to the second driveway. Turn right onto driveway.

Option 2: to campsite - travel  $\frac{1}{2}$  mile on Hwy J to the gated logging road (about  $\frac{1}{4}$  mile after the power lines). Turn right onto logging road.

### Facilities:

The site includes a developed campsite in the southeast corner of the property, a trail system that links and accesses all parts of the property and a ranch-style cabin with an open design (24 x 36 feet) located on the northeast shore of Noboken Lake. There is a small parking area next to the cabin as well as at the campsite. There is an outdoor restroom facility next

to the cabin. Nearby educational resources include Peters Marsh Wildlife Area and the Jack Lake Recreational System (which includes a park, picnic area, an arboretum, Game Lake nature trail and cross-country ski trails). The National Ice Age Trail runs through the northeast corner of the property. In addition, the property adjoins Langlade County forestland on three sides.

## **Site history**

This area was completely covered by glaciations during the last ice age. Glaciers reached their greatest southern extend in Wisconsin (present day Janesville in Rock County) about 14,000 to 16,000 years ago before melting back. When the ice melted, sand, silt, cobbles and boulders frozen in it were released and formed ridges called moraines, which are evident throughout the site. Large chunks of melting glaciers buried under debris also formed small lakes, ponds and bogs such as the ones we find at our site.

The original land cover of the area was upland deciduous/coniferous forest. Very little of that old growth forest still remains in the state, and none of it can be found at our site. Many cut and burned stumps are still visible today, evidence of the extensive logging and stump burning operations of the early 1900's. After the logging operations, numerous school groups and Civilian Conservation Corps operations were responsible for re-planting many of the trees currently present on the property.

## **Site management**

Key goals:

1. Provide an ecologically diverse and accessible site for educational use.
2. Provide a diverse and accessible site for school and community recreation.
3. Manage the land to maintain ecosystems in various stages of succession.
4. Manage the site using education rather than financial investment as a primary focus.
5. Maintain and improve the site trails, facilities and resources.

Objectives:

1. Involve students in maintaining and improving the site facility.
2. Manage the site for optimal educational and recreational value as stated in the goals above.

# Educational Connections

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## Key Concepts

1. Sustainable natural resources management aims to provide essential resources for humans, enhance local communities and protect the health of the land.
2. The natural world can provide opportunities to enhance our physical, social, cognitive and emotional health.
3. Environmental factors limit the numbers of organisms living within their influence.
4. Diversity of species and ecosystems are important factors of land health.
5. Ecosystems change through time because of disturbance and succession.
6. Ecosystems contain both living (biotic) and non-living (abiotic) components.
7. Cultural, economic, social and political factors determine man's values, understandings, appreciation and individual attitudes towards his environment and his peers.

## Staff development

Once a curriculum scope and sequence is developed and adopted by the district, the district in-service training will be provided for teachers to become more familiar with the school forest site and curriculum. The topics to be covered during the in-service include:

- Wetland ecology and management
- Forest ecology and management
- Outdoor education methods
- School forest activities
- Infusion of environmental education into the classroom
- Environmental education curriculum including LEAF, PLT, WET, WILD, KEEP, etc.



Teachers will also be encouraged to take advantage of other environmental education curriculum offerings provided by other organizations, including UWSP, Trees For Tomorrow, Treehaven, etc.

Professional development will be approached in a collaborative manner to work with resource managers, organizations and knowledgeable individuals to offer in-services/workshops.

## **Assessment**

The on-going success of the school forest program will be assessed in a variety of ways, including:

- Annual surveys of teachers to determine student usage and perceived value of the school forest education experiences.
- Student surveys of environmental knowledge (one grade/year)

Activity	Subject	Key Concepts	Wisconsin Standards
<p>Grades K-5</p>			
<p>Use a field guide to identify trees common in our area</p>	<p>Science</p>	<p>4,6</p>	<p>EE B.4.5 Sci. B.4.1 Lang. Arts A.8.3 IT A.4.2, B.4.4</p>
<p>Classify trees into evergreen and deciduous</p>	<p>Science</p>	<p>4</p>	<p>EE B.4.5 Sci. F.4.3</p>
<p>Age a tree by counting rings</p>	<p>Math, Science</p>	<p>1</p>	<p>Math D.4.1, Sci. F.4.2, F.4.3</p>
<p>Use various instruments to measure trees, calculate how much wood is in a given area and describe the products the wood could be used for</p>	<p>Math, Science, Social Studies</p>	<p>1,7</p>	<p>Math D.8.2 Soc. St. A.4.2, A.8.1 EE A.4.2, B.8.12 IT A.4.1</p>
<p>Collect leaves and sort by color and/or shape</p>	<p>Math, Art</p>	<p>4</p>	<p>Math F.4.3 Art H.4.1</p>
<p>Make a Tree - Identify and label the parts of a tree by creating a tree from dead branches and leaves</p>	<p>Science</p>	<p>1,4,5</p>	<p>EE B.4.5 Sci. A.4.5, C.4.1, F.4.1, F.4.3</p>

Classroom Curriculum Connections K-5

Write an acrostic poem about a type of tree identified in our school forest	Language Arts, Science	2,7	EE B.4.5 Lang. Arts B.8.1
Sense Activity - Develop awareness of the natural world by using all five senses	Language Arts, Science	2,7	EE A.4.1 Lang. Arts C.4.1
Make drawings showing the features of a forest after taking a hike to observe and identify the living and nonliving components of the forest	Science, Art, Phy. Ed.	2,6	EE B.4.5 Sci. B.8.6 P.E. A.4.1, A.8.2, D.4.1, D.8.1, D.12.1 Art A.4.1, A.4.6, C.4.5, E.4.1, E.4.4, H.4.1, K.4.3
Study the habitat needs of animals and decide if various animals can live in the school forest. Draw pictures of their favorite animal that could live in our forest	Science, Reading, Art, Language Arts	4,6	EE B.4.4, B.4.5, B.4.6 Sci. F.4.1, F.4.4 Lang. Arts A.4.1 Art E.4.4, H.4.1, H.4.2
Identify the interrelationship between forest citizens	Science	4,5	EE B.4.1 Sci. A.4.1, A.4.2, A.4.3, A.4.4, B.4.4, B.4.5, C.4.1

Classroom Curriculum Connections K-5

Birds and Worms - Understand the importance of camouflage for animal survival through a physically active game	Science, Phy. Ed.	4,6	EE B.4.6 Sci. F.4.1, F.4.2 P.E. D.4.1, D.8.1
Predator, Prey - Understand how predators and prey affect each other	Science	1,4	EE B.4.1, B4.4 Sci. F.4.1, F.4.5
Deer Ears - Identify how some animals rely on their sense of sound to detect predators and/or danger	Science	4	EE B.4.6 Sci. C.4.8, F.4.1
Shelter Shuffle - Identify the essential components of habitat and how they affect animal populations	Science	1,3,4,6,7	EE B.4.1, B.4.4 Sci. A.4.5, C.4.8, F.4.1
Noah's Ark - Demonstrate how animals find their mate by use of sounds	Phy. Ed., Science	2,4	Sci. F.4.1 P.E. D.4.1, D.8.1
Recognize how history has shaped the area that we live in	Social Studies, Science	1,3,5,7	EE A.4.1, A.4.2, A.4.3 Soc. St. B.4.1, B.8.3 IT A.4.2, A.4.4

Classroom Curriculum Connections K-5

<p>Identify the value of the school forest after completing a scavenger hunt</p>	<p>Social Studies, Science, Phy. Ed.</p>	<p>1,5,7</p>	<p>EE A.4.1, E.4.1, E.4.2 Sci. C.4.2, F.4.1, H.4.4 Soc. St. A.8.1 P.E. D.4.1, D.4.3, D.8.1, D.12.1</p>
<p>Forest consequences - Understand the various positive and negative consequences of human activities on a forest</p>	<p>Science, Language Arts</p>	<p>1,4,6</p>	<p>EE E.4.1, E.4.2 Sci. B.4.3, H.4.1</p>
<p>Trail hike</p>	<p>Phy. Ed.</p>	<p>2</p>	<p>P.E. A.8.2, A.12.1, C.4.4, D.4.1, D.8.1, D.12.1, D.12.2, F.4.1, F.4.2, F.8.3, F.8.4, F.12.5</p>
<p>Increase self-esteem and develop teamwork skills by completing confidence course challenges</p>	<p>Phy. Ed., Social Studies</p>	<p>2</p>	<p>Soc. St. E.8.4 P. E. A.12.1, C.4.4, D.4.3, D.8.1, D.12.1, D.12.2, F.4.1, F.4.2, F.8.3, F.8.6, F.12.5, G.8.3, G.8.4 IT D.4.1</p>

Classroom Curriculum Connections K-5

Make measurements of various areas of the school forest and calculate area and circumference	Math, Social Studies	1,2	Math D.8.2 Soc. St. A.4.2, A.8.1 IT A.4.1, A.4.5
Use map of the school forest to find lunch	Social Studies, Phy. Ed.	1,2	Soc. St. A.4.2, A.8.1
Explain and demonstrate what foresters do by collecting and discussing data	Guidance, Science, Math, Language Arts	1,4,5,6	EE B.4.11 Lang. Arts C.4.1, C.4.3 IT A.4.2, A.4.4
Sound Map - Make a drawing of a natural area based on what you hear	Art, Science	3	Lang. Arts C.4.1, F.4.1 EE C.4.4
Make a Park - Create a 3D map on the ground to show how you would manage a park for wildlife	Science, Social Studies, Language, Arts	1,3,4,5,6,7	Sci. A.4.5 Math C.4.1 Lang. Arts C.4.1, F.4.1 Art H.4.5, E.4.4 IT A.4.5, B.4.7
Nature Words - Develop vocabulary by describing words to best describe objects in nature	Language Arts	1,3	Lang. Arts C.4.1, D.4.1

Classroom Curriculum Connections K-5

Simile Stroll - Use similes to describe a particular spot in the forest	Language Arts	2	Lang. Arts C.4.1, B.4.1, C.4.2
Student Sundial - Identify directions using signs from in nature	Science	2	Sci. C.4.1, C.4.8
Sharing Circle - Develop interpersonal and communication skills by sharing what was learned during the day	Language Arts, Science	3,4,5,6	Lang. Arts C.4.1, C.4.2, C.4.3 IT D.4.1

<b>Grades 6-8</b>				
Adaptations of Marine Life - Develop an understanding of animal adaptations that help them survive in specific habitats	Math, Science	1,3	EE B.8.8 Math D.8.2, D.8.4 Sci. A.8.2, C.8.3	
Explain the balance of living and non-living things in a pond ecosystem	Math, Science	6,5	EE B.8.1, B.8.3, B.8.6, B.8.8 Math E.8.4, E.8.2	
Develop personal, community, and global responsibility by discussing their own personal actions on the environment	English, Math, Social Studies, Science	7,1,2	EE D.8.1, D.8.5 Math E.8.4, E.8.2, D.8.2 Sci. A.8.4, F.8.2 Lang. Arts B.8.2, C.8.4 Soc. St. C.8.3 IT D.8.1	
Identify the causes and effects of air pollution and acid rain	Math, Science	1,3,5	EE B.8.13, B.8.15, B.8.17, B.8.21, Math C.8.1, C.8.4 Sci. F.8.2, B.8.3	



Classroom Curriculum Connections 6-8

<p>Identify the characteristics and importance of wetlands</p>	<p>Language Arts, Science</p>	<p>5,1</p>	<p>EE B.8.1, B.8.6 Sci. A.8.1, A.8.2 Lang. Arts A.8.3, C.8.4</p>
<p>Describe cause and effect events in nature</p>	<p>Social Studies, Language Arts, Science</p>	<p>1,6,5,4</p>	<p>EE B.8.2 Sci. A.8.1, A.8.2, E.8.3 Lang. Arts B.8.2, B.8.5</p>
<p>Test water samples to determine how water quality affects life in the water</p>	<p>Math, Science</p>	<p>6,7</p>	<p>EE B.8.1, B.8.6 Math E.8.2 Sci. C.8.2, C.8.3 IT A.8.1</p>
<p>Identify and recognize the essential components of habitats available to birds at the school forest</p>	<p>Math, Science, Language Arts, Social Studies</p>	<p>4,5,6,1,2</p>	<p>EE B.8.3, B.8.8, B.8.10 Math E.8.1, E.8.4 Sci. D.8.2, D.8.5 Lang. Arts B.8.2, B.8.1 Soc. St. A.8.2, A.8.4</p>

Classroom Curriculum Connections 6-8

<p>Identify different types of forest habitat, map forest features using data collection, tree identification, measurement and aging</p>	<p>Science, Math, Social Studies</p>	<p>1,3,4,5,6</p>	<p>EE B.8.3, B.8.8, B.8.10 Math E.8.1, E.8.4 Sci. D.8.2, D8.5 Soc. St. A.8.2, A.8.4 IT A.8.2, A.8.4, B.8.4</p>
<p>Study and collect data on the biodiversity of the school forest habitats</p>	<p>Science, Social Studies</p>	<p>1,3,4</p>	<p>EE A.8.3, B.8.3, B.8.8 Soc. St. A.8.2, A.8.4 IT A.8.1, B.8.4</p>

<b>Grades 9-12</b>				
Use field guides to identify plants and animals	Biology, Environmental Science, Ag. Wildlife	4,6,	Sci. F.12.5 IT A.12.4, B.12.3	
Plant physiology- study plant structure and function	Biology, Ag. Forestry	6	Sci. F.12.11	
Use a dichotomous key to identify and taxonomically classify trees, flowers, ferns or animals	Biology, Environmental Science, Ag. Wildlife	4,6	Sci. F.12.5 IT A.12.4, B.12.3	
Identify the diversity of the animals in the school forest by live trapping, identifying scat, tracks, dens, nests, sounds or other signs	Biology, Environmental Science, Ag. Wildlife	1,3,4	Sci. F.12.7 EE B.12.4, B.12.7 IT B.12.2	
Study and identify edible wild plants, make dishes using them	Health/Consumer Ed., Biology	2,6,7	Sci. F.12.5, F.12.9 EE B.12.2, B.12.10 IT B.12.3	

Study aspects of forest and wetland biomes, identify and study unique characteristics of each	Environmental Science	3,4,5,6	EE B.12.2, B.12.4, B.12.7 Soc. St. A.12.8
Study beaver ecology	Ag. Wildlife, Environmental Science	3,4,5,7	Sci. F.12.7 EE B.12.2
Study the characteristics of bog environments in relation to rates of decomposition and the preservation of artifacts	Biology, Environmental Science, Chemistry, Physical Science, Social Studies	5,6,7	Sci. D.12.1, D.12.4 Soc. St. B.12.3
Conduct a biodiversity study at the school forest	Environmental Science, Biology	2,3,4	Sci. F.12.7 EE B.12.7 IT A.8.1, B.12.2
Conduct plot studies of plant diversity in the wetland and forest and graph the results (forest community analysis)	Math, Environmental Science	1,4,6	EE B.12.2, B.12.7 Math C.12.4 IT A.8.5, B.12.2, B.12.5

Measure and compare water, air and soil temperature in the different habitat types (bog, aspen forest, red pine plantation, mature hardwood forest, etc.)	Environmental Science, Physical Science, Biology	1,3,6	EE B.12.4 Sci. D.12.3, D.12.4, D.12.5 IT A.8.1, A.12.3, B.12.5
Study variations of climatic factors within a small geographic area (microclimate studies)	Environmental Science, Biology, Physical Science	3,4,5,6	EE B.12.2, B.12.4, B.12.6
Study biotic and abiotic factors in an ecosystem and the interaction between them	Environmental Science	3,4,5,6	EE B.12.2, B.12.4, B.12.6
Examine how the amount of light penetrating to the forest floor affects plant life and growth by comparing tree regeneration in thinned versus un-thinned areas of the forest	Biology, Environmental Science, Ag	3,4,5	EE B.12.2, B.12.4, B.12.6, B.12.8, B.12.9
Physically and chemically analyze soils in different habitat types (study soil horizons in soil pits)	Environmental Science, Chemistry	1,3,6,7	EE B.12.5 Sci. D.12.1, D.12.4 IT A.8.1, B.12.2

Classroom Curriculum Connections 9-12

Analyze the water chemistry and biological conditions of the wetland to determine its health	Environmental Science, Chemistry	1,3,6,7	EE B.12.5, B.12.6, B.12.7, B.12.8, B.12.9, B.12.10 Sci. D.12.4 IT A.8.1, B.12.2
Study the impacts of water pollution on wildlife used for human consumption (i.e., fish advisories)	Health/Consumer Ed., Environmental Science, Chemistry	1,5	EE B.12.3, B.12.5, B.12.6, B.12.8, B.12.9, B.12.11, B.12.18 Sci. D.12.4 Health A.12.2 IT A.12.4, B.12.3
Conduct air pollution studies using lichen identification and technical equipment and comparing forest readings to city readings	Environmental Science, Math	3,4,6	EE B.12.3, B.12.5, B.12.6, B.12.8, B.12.9, B.12.1, B.12.18 Sci. D.12.4 Health A.12.2 Math B.12.2 IT A.8.1

<p>Study energy transfer in ecosystems by constructing and studying food chains and food webs</p>	<p>Biology, Environmental Science, Ag. Wildlife</p>	<p>3,4,6</p>	<p>EE B.12.2, B.12.4, B.12.6, B.12.7 Sci. F.12.9</p>
<p>Study fungi and bacteria as decomposers and their role in the ecosystem</p>	<p>Biology, Environmental Science, Social Studies</p>	<p>3,4,7</p>	<p>EE B.12.2, B.12.6, B.12.7 Sci. F.12.10</p>
<p>Phenology studies (signs of fall, spring, winter, summer)</p>	<p>Biology, Environmental Science, Art</p>	<p>2,5</p>	<p>EE B.12.6 Sci. E.12.2 Art A.12.6, B.12.3, C.12.5</p>
<p>Fire ecology: Study the role of fires in forest ecosystems</p>	<p>Social Studies, Environmental Science, Ag. Wildlife</p>	<p>3,5</p>	<p>EE B.12.4, B.12.6, B.12.9 Sci. F.12.8 Soc. St. A.12.6 Ag E.12.1, E.12.2</p>
<p>Recognize that natural environments are involved in a process of continual change (Study stages of succession)</p>	<p>Environmental Science</p>	<p>3,4,5</p>	<p>EE B.12.2, B.12.4, B.12.6, B.12.7, B.12.9 Sci. F.12.8 Soc. St. A.12.6</p>

<p>Study the geologic history of the area-focusing on the features/topography of the school forest</p>	<p>Environmental Science, Social Studies</p>	<p>6</p>	<p>Sci. E.12.2, D.12.12 Soc. St. A.12.6 IT A.12.4, B.12.2, B.12.3</p>
<p>Study erosion and landforms (hill, valleys, depressions, tip ups, windfalls, etc.)</p>	<p>Environmental Science, Ag. Forestry, Social Studies</p>	<p>3,4,5,6</p>	<p>Sci. E.12.2, D.12.12 Soc. St. A.12.6 Ag E.12.4</p>
<p>Create a topographical map to scale</p>	<p>Social Studies, math, Graphic design</p>	<p>2,6,7</p>	<p>Math E.12.1, A.12.1, A.12.3 Soc. St. A.12.3 Sci. C.12.5 Art E.12.2, H.12.5 IT A.8.1, A.12.5, B.12.7</p>
<p>Map the school forest watershed to determine its role in the hydrologic cycle and describe how the amount of water along with soil types determines the different habitat types</p>	<p>Environmental Science</p>	<p>1,3,4,5,6,7</p>	<p>EE B.12.5 Sci. D.12.2, E.12.2 Soc. St. A.12.5 Math D.12.2, D.12.3 IT A.12.3, A.12.4, B.12.2, B.12.7</p>



Classroom Curriculum Connections 9-12

<p>Comparison of human vs. natural communities (habitat, niche, sharing of natural phenomena, environmental problems)</p>	<p>Social Studies, Biology, Environmental Science</p>	<p>3,4,6,7</p>	<p>Sci. C.12.4, F.12.8</p>
<p>Conduct a scavenger hunt for community/social things analogous to human communities</p>	<p>Social Studies</p>	<p>2,4,6</p>	<p>Sci. C.12.2, C.12.3, F.12.7, F.12.8</p>
<p>Research and report on global uses of forest products that are/can be produced at the school forest by following a product from harvest to consumption</p>	<p>Environmental Science, Social Studies, Marketing and Promotions</p>	<p>1,3,6,7</p>	<p>EE A.12.1, B.12.16, B.12.12, D.12.9 Soc. St. D.12.8 Marketing D.12.2, D.ME.6 IT A.12.4, B.12.1, B.12.2, B.12.3, B.12.4, B.12.5, B.12.6</p>
<p>Examine how different tree species respond to various logging techniques (clear cutting vs. selective cutting)</p>	<p>Ag. Forestry, Environmental Science</p>	<p>1,3,4,5</p>	<p>EE B.12.13, C.12.1 Sci. E.12.4, F.12.8 Ag. E.12.1, E.12.2, E.12.4, E.12.6</p>

Identify mangement options for the forest to improve wildlife habitat	Ag. Wildlife, Ag. Forestry, Environmental Science	1,3,4,5,6,7	Sci. F.12.9 EE C.12.1 Ag. B.12.3
Develop a mangement plan for the school forest that provides ecological, social and economic benefits	Ag, Environmental Science	1,2,3,4,5,6,7	EE D.12.5, E.12.2 Sci. C.12.6 Ag. B.12.2, E.12.1 IT A.12.4, A.12.5, B.12.6, D.12.1
Measure the trees in the forest using diameter, circumference and height to calculate volume and board feet	Math, Ag, Environmental Science	1,6	EE A.12.4 Math D.12.2 Ag. E.12.6 IT A.8.1
Learn to estimate the age of trees using ring measurements, then link these to historical events and weather patterns	Ag. Forestry, Biology, Math, Social Studies	1,5,7	EE B.12.3, C.12.3 Soc. St. A.12.6 Math D.12.3 Ag. E.12.1
Conduct a scavenger hunt for geometric figures	Math	2,4,6	Math C.12.1

<p>Art activities: study light/shadow, texture, camouflage, time and motion studies, perspective studies, colors of nature, photography, detailed microscopic drawings, conduct artwork on birch tree bark</p>	<p>Art, Graphic Arts, Drafting, Tech. Ed.</p>	<p>1,2,7</p>	<p>EE E.12.1 Art C.12.5, C.12.8, H.12.2, H.12.3</p>
<p>Identify the inspirational benefits of nature using art activities such as designing furniture from stumps, designing jewelry from natural objects, making snow sculptures, etc.</p>	<p>Art, Drafting, Tech. Ed.</p>	<p>1,2,7</p>	<p>EE E.12.1 Art C.12.1, C.12.5, C.12.8, I.12.1, J.12.6</p>
<p>Conduct a scavenger hunt for biology/art objects</p>	<p>Biology, Art</p>	<p>2,4,6</p>	<p>Sci. F.12.1 Art A.12.1, B.12.3, B.12.6</p>
<p>Operate and maneuver a canoe and snow shoes</p>	<p>Phy. Ed.</p>	<p>2,7</p>	<p>P.E. A.12.1, B.12.1, D.12.1, D.12.2, F.12.5</p>
<p>Study the impact of human recreational activities on the environment</p>	<p>Phy. Ed., Environmental Science</p>	<p>1,2,7</p>	<p>EE B.12.8, C.12.1, D.12.6 P.E. A.12.4</p>

<p>Use an orienteering course to practice map reading and compass reading skills</p>	<p>Phy. Ed., Math, Social Studies</p>	<p>2</p>	<p>Math D.12.2, D.12.3 Soc. St. A.12.1, P.E. A.12.1, B.12.1 IT A.8.1</p>
<p>Identify the physical, emotional, spiritual and aesthetic values of nature through recreational activities</p>	<p>Phy. Ed.</p>	<p>2,7</p>	<p>Soc. St. E.12.6 EE C.12.2, D.12.6 P.E. A.12.1, D.12.1</p>
<p>Creative writing projects inspired by time spent in the forest</p>	<p>English</p>	<p>2,4,6,7</p>	<p>English B.12.1, B.12.2, B.12.3 IT A.12.2, A.12.5</p>
<p>Develop materials (pamphlets, interpretive signs, trail guides, etc.) to educate others about the school forest</p>	<p>English, Art, Marketing and Promotions, Graphic Arts</p>	<p>1,2,3,4,5,6,7</p>	<p>English B.12.2, E.12.3 Marketing D.ME.7, D.ME.4 Art E.12.2, H.12.5 IT A.12.3, A.12.5, B.12.7</p>

## Resources

### Available

#### People

- School forest committee members
- Director of Instruction and Achievement
- LEAF Program
- UW-Stevens Point
- DNR forester
- Ice-Age Trail Park and Trail Foundation - local chapter
- Quality Deer Management
- Kretz Lumber
- Whitetails Unlimited
- Ducks Unlimited
- Wisconsin Waterfowl Association
- National Wild Turkey Federation - local chapter

#### Materials

##### General:

- Maps of school forest
- School forest education plan
- School forest management plan

##### Safety:

- First aid kits

##### Forestry Measurement:

- Tree keys

##### Timber Management:

- Bow saws (3)

##### Wildlife Management:

- Binoculars (15)
- Radio telemetry equipment
- Scat replicas
- Trail cam

##### Aquatic studies:

- Seine net (1)
- Secchi disk (1)

##### Recreation:

- Compasses (15)
- Overhead teaching compass (1)
- Campsite
- Tents
- 6-man tents (5)
- 4-man tents (3)
- Sleeping mats (50)
- Sleeping bags (2)
- Screen tent (1)

##### Multimedia resources:

- Topographical mapping software

##### Facilities:

- Cabin
- Outdoor restroom facility

## Needed

### People

- Parent volunteers as chaperones
- Community volunteers for trail work
- K-12 teacher involvement
- School Forest Coordinator

### Materials

#### General:

- School forest user's guide/teacher handbook
- Clipboards (30)
- Trash containers
- Water coolers
- Field guides

#### Safety:

- Flashlights and batteries
- Blankets
- Cell phone
- Fire extinguisher

#### Recording:

##### Video camera

- 35mm camera (digital)
- Tape recorder/CD player

#### Basic exploring:

- Insect nets (15)
- Bug boxes (15)
- Stereomicroscopes (15)
- Compound microscopes (15)
- Pails and containers

- Funnels
- Ice cube trays for sorting specimens
- Garden tools (trowels, forks, etc.)

#### Forestry measurement:

- Tree cookies (30)
- Wood samples (2)
- Board foot samples (15)
- Biltmore sticks (30)
- Prisms (5)

#### Aquatic studies:

- Pond nets (15)
- Minnow traps (5)
- Pails (15)
- Petri dishes (50)
- Spoons (50)
- Forceps (15)
- Water quality test kits (15)
- Thermometers (15)
- Waders/rubber boots (30)
- Groundwater model (1)

#### Wildlife management:

- Echolocator (1)
- Live traps
- Skulls
- Study skins
- Mounted specimens
- Plaster of Paris
- Nests and Hives
- Artificial nest boxes
- Dissection kits (15)

- Plastic landscaping edging
- Coffee cans

#### Geology/Soils:

- Soil samples
- Soil test kits (15)
- Soil sieves (15)
- Soil thermometers (15)
- Soil color charts (15)
- Trowels (15)
- Reference specimens
- Soil pits

#### Recreation:

- Fishing rods and reels
- Snowshoes
- Challenge/confidence course materials
- Canoes

#### Curriculum Guides:

- WET
- Project WILD
- Project WILD - Aquatic
- Project Learning Tree
- LEAF Curriculum guides

#### Facilities

- Picnic type shelter
- Restrooms
- Trail signs
- Trail benches
- Running water
- Education/sleeping lodge
- Deck/pier
- Amphitheater
- Education stations
- Storage cabinets

## Sustaining the School Forest Program

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### **School Forest Committee - established Aug. 2003**

Mike Werdeo - Chairperson - HS biology/wildlife management teacher

Kristine Sladek - HS biology/environmental science teacher

Jason Fuehrer - MS Cultural education teacher

Tom Beattie - 4<sup>th</sup> grade teacher

John Schimmels - 3<sup>rd</sup> grade teacher

Tim Prunty - Director of Building and Grounds

Keith Lindner - DNR Forester

Sarah Zelazoski - Director of School/Community Programs

Bill Bockes - Community member

Joe Novak - Community member

Others who are consulted as needed and have offered their support:

Mary Jo Filbrandt - Business administrator

Cindy Fischer - Director of Instruction and Achievement

The school forest committee will be responsible for all aspects of the development, management and use of the school forest. As the need arises, ad hoc subcommittees will be formed to work on specific projects and issues. These subcommittees will utilize the expertise of other staff and community members who have an interest in the school forest.

### **Communication**

The school forest committee will continue to submit 2 articles per year to the Antigo Daily Journal for use in its weekly "Inside Our Schools" feature.

Seasonal e-mails to district staff will be created by the school forest committee to remind and encourage teachers to utilize the school forest.



Information will be shared with the media for all major events at the school forest including community involvement, student participation, teacher training and site development.

Presentations about activities at the school forest will be made at least annually to the school board.

The district will be encouraged to hold annual in-service training for teachers to become more familiar with the school forest site and curriculum, as well as promote staff attendance at EE workshops throughout the area.

A school forest website will be created to post updates to the school forest, community activities, education plans and lessons and teacher handbook. This website will be linked to the Antigo School District website.

## **Long-range plan**

In order to fulfill our vision for the use of the school forest, we have identified the following goals for the school forest committee:

- Train teachers and assistants to feel comfortable teaching students about the environment outdoors.
- Develop a solid educational scope and sequence for students to maximize learning at the school forest.
- Continue to manage the school forest to upkeep trails and manage the forest and wildlife to optimize the diversity and health of the site.
- Build a permanent education and lodging facility.

Future vision:

- In every grade level, at least once per year, students will have the opportunity to visit the school forest for outdoor environmental education.
- The fifth grade program will begin utilizing the school forest site.
- A high school course will be created to train student facilitators.
- Community events will be held at the school forest.
- A coordinator will be hired.

## **Implementation plan**

Develop a forest management plan that is tied to the educational goals described in the education plan.

Develop maps of the school forest trail systems and educational activity stations.

Provide in-service training for district staff.

Complete trails, improve existing trails and create signage for the trails.

Build a picnic-type shelter near the camping site.

Create access to Noboken Lake and to the pond.

## **District commitment**

In 2005, the Antigo School Board made a commitment to the school forest by supporting and endorsing a WEEB grant for \$5,000.00 with a substantial match from the district. The grant was awarded and is being used to create a school forest education plan.

The School Forest Education Plan for Noboken Lake School Forest will be presented to the school board during the 2006-2007 school year for policy adoption.