Discovering Barnegat Bay

The Maritime FOREST

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Illustration by Cathy O'Leary

SOUTHERN RED OAK
(Quercus falcata)

1 Objectives:

Students will be able to:

■ identify at least two examples of plant communities and describe two ecological and two human caused factors that determine the composition of these communities,

■ identify 10 characteristic tree and shrub species within the Maritime Forest,

■ gather pertinent field data and describe the effects of soil conditions, fire and agricultural practices on the Maritime Forest study site.

CORRELATION TO NJCCCS:
The correlations in this publication were done prior to 2002 utilizing the older standards from 1994.

SOCIAL STUDIES: 6.9.5
SCIENCE: 5.2.9, 5.6.8, 5.7.8, 5.12.7
MATHEMATICS: 4.1.10, 4.12.9
LANGUAGE ARTS: 3.4.25
CROSS CONTENT: 3.7, 3.12, 4.2

Subject Areas

Social studies, Science, Mathematics, Language Arts, Cross Content Workplace Readiness

Duration

One to two class periods.

Setting

Field study at site with a maritime forest.

Skills

Observing, data collection, interpreting, following directions, tree identification.

Vocabulary

maritime forest.

2 Materials

- Worksheets
- Pruners
- Pencils
- Ziplock bags
- Clipboards
- Self-adhesive labels
- Field guides
- Map Boards
- 50 ft. tape measure

3 Background

Plant communities evolve due to such factors as elevation, hydrology, soils, as well as natural and human-caused disturbances such as fire, flooding, logging, mechanized vehicles, and housing development.

The Maritime Forest, once a long unbroken band of tall luxuriant mature forest from Cape May to Sandy Hook has been fragmented into small remnant plant communities due to intense development pressure.

Human use of the coastal plant communities such as Maritime Forest, Dune-Thicket and Salt Marsh contributes to, modifies, destroys or maintains the ecosystem and impacts of human use may be readily observed.

4 Procedure

WARM UP:

■ Students should become familiar with several tree and shrub species found in a Maritime Forest through the use of field guides and photographs (see check list included with this lesson).

■ Students should become familiar with some possible effects of natural and human-caused impacts to a plant community.

■ Students should be able to understand such ecological terms as: quadrat, biological succession, disturbance, impact, specimen, climax, plant community and soil amendment.

■ Students should be divided into study teams for field studies, data collection and reporting.

THE ACTIVITY

■ Each study team of four to six students will examine at least four (4) 50 ft. square quadrat stations representative of the Maritime Forest.

■ Students are to identify and record populations of four different characteristic tree and shrub species in each marked-off 50-ft. square quadrat. Identification will be made using field guides and observing identifying characteristics of each species, i.e. leaves, seeds, bark.

■ Students will describe each species by use of field notes, sketch, twig, leaf, and seed collection and mapping of each species location and population within quadrat.

POST TRIP ACTIVITIES:

■ Students will compare findings from field investigations and develop a master inventory and map.

■ Students will discuss the importance of monitoring and inventorying representative areas of Maritime Forest and other plant communities.

■ Students will describe best management practices to ensure the ecological viability of the Maritime Forest Plant Community.

5 Assessment

Students will demonstrate an understanding of previously stated objectives through:

1. Group report of findings
2. Classroom discussion of field experience.
3. Assessments and recommendations of past, present, and proposed human land use impacts on the coastal environment.
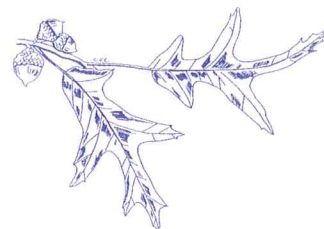
THE MARITIME FOREST

by Terry O'Leary

The Atlantic Coastal Plain occupies over 2,000 square miles in southeastern New Jersey and is comprised of several vegetation types that are known as plant communities. These communities evolve due to such factors as elevation, hydrology, and soils. Other contributing factors are natural and human caused disturbances such as fire, flooding, climate, logging, sand and gravel mining, agricultural practices and development.

In Coastal Plain uplands, the plant communities are chiefly Oak-Pine and Pine-Oak Forests. In lowland areas of the Coastal Plain Hardwood Swamps, White Cedar Swamps, Open Savanna and Pitch Pine Lowland Forests may be encountered. In proximity to the coast, there are remnants of Dune-Thicket, Salt Marsh and adjacent Maritime Forest plant communities.

Due to intense development pressures along the shore region, much of the Dune-Thicket and Maritime Forest have been eradicated. In the early 1970s, widespread development of lagoon communities destroyed substantial salt marsh areas as well.

The Maritime Forest Community is characterized by a slightly more luxuriant and taller climax forest than the Pine Oak and Oak Pine Forests found further inland.

Contributing factors include slightly increased soil fertility, and in some instances, decreased forest fire frequency than has been experienced in the heart of the Pine Barrens area. From colonial times, substantial areas of Maritime Forest were cleared for coastal farms and homesteads.

Most of the Maritime Forest existing in the 1700s was cut down for boatbuilding, forest products, farming and pasture by the early settlers of the region. Once farming activity began to decline in the 1950s, biological succession, aided by heaps of clam and oyster shells (in many cases tilled into the soil by the area pioneers), transformed these farm fields into forests. Many of these former fields are now mature Maritime Forest communities. These transformations have occurred in a relatively short period of time (approximately 50 years). A number of large specimens of maritime tree species may be found along old sand roads and wagon trails where hedgerows were located between old farm and pasture fields. Examples of nearly all typical species from the Maritime Forest that once were found in a long unbroken band from Cape May to Sandy Hook, can be found along these trails. Cultivars introduced by the settlers, including a number of invasive species, may also be encountered.

6 *Resources Referenced*

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CHARACTERISTIC SPECIES OF THE MARITIME FOREST

S H R U B S

CHECK	COMMON NAME	SCIENTIFIC NAME
	Marsh Elder	Iva frutescens
	Highbush Blueberry	Vaccinium corymbosum
	Bayberry	Myrica pensylvanica
	Sweet Pepperbush	Clethra alnifolia
	Mountain Laurel	Kalmia latifolia
	Groundsel	Baccharis halimifolia
	Toothed Arrowood	Viburnum dentatum
	Poison Ivy	Toxicodendron radicans
	Highbush Blackberry	Rubus alleghaniensis
	Greenbriar	Smilax rotundifloia
	Multiflora Rose	Rosa multiflora
	Japanese Honeysuckle	Lonicera japonica
	Fox Grape	Vitis labrusca
	Marsh Fern	Thelypteris palustris
	Ebony Spleenwort	Asplenium platyneuron
	Common Reed Grass	Phragmites australis
	Sensitive Fern	Onoclea sensibilis
	Wax Myrtle	Myrica cerifera
	Winterberry	Ilex verticillata
	Sweet Fern	Comptonia peregrina
	Spice bush	Lindera benzoin
	Choke Cherry	Prunus virginiana
	Beach Plum	Prunus maritima
	Dwarf Sumac	Rhus copallinum
	Staghorn Sumac	Rhus typhina
	Virginia Creeper	Parthenocissus quinquefolia
	Swamp Azalea	Rhodendron viscosum
	Staggerbush	Lyonia mariana
	Fetterbush	Leucothoe racemosa
	Elderberry	Sambucus canadensis

CHARACTERISTIC SPECIES OF THE MARITIME FOREST

T R E E S

CHECK	COMMON NAME	SCIENTIFIC NAME
	Sour Gum	*Nyssa sylvatica*
	Spanish Oak	*Quercus falcata*
	Sweet Gum	*Liquidambar styraciflua*
	Red Maple	*Acer rubrum*
	Hackberry	*Celtis occidentalis*
	Wild Black Cherry	*Prunus serotina*
	Pitch Pine	*Pinus rigida*
	Sassafras	*Sassafras albidum*
	Loblolly Pine	*Pinus taeda*
	American Holly	*Ilex opaca*
	Virginia Pine	*Pinus virginiana*
	Persimmon	*Diospyros virginiana*
	Red Cedar	*Juniperus virginiana*
	White Oak	*Quercus alba*
	Black Oak	*Quercus velutina*
	Pin Oak	*Quercus palustris*
	Scarlet Oak	*Quercus coccinea*
	Willow Oak	*Quercus phellos*
	Shortleaf Pine	*Pinus echinata*
	Swamp Magnolia	*Magnolia viginiana*
	Grey Birch	*Betula populifolia*
	Shadbush	*Amelanchier canadensis*
	Black Willow	*Salix nigra*

NOTES

CHARACTERISTIC SPECIES OF THE MARITIME FOREST

CHECK	COMMON NAME	SCIENTIFIC NAME
	Tamarack	*Larix laricina*
	American Elm	*Ulmus americana*
	Balsam Fir	*Abies balsamea*
	American Beech	*Fagus grandifolia*
	Shagbark Hickory	*Carya ovata*
	Bigtooth Aspen	*Populus grandidentata*
	Apple	*Pyrus malus*
	Norway Maple	*Acer platanoides*
	Japanese Cryptomeria	*Cryptomeria japonica*
	Norway Spruce	*Picea abies*
	Hybrid Cherry	*Prunus yedosis*
	Tree of Heaven	*Ailanthus altissima*
	English Boxwood	*Sempervirens*
	White Pine	*Pinus strobus*
	White dogwood	*Cornus florida*
	White Mulberry	*Morus alba*
	Rattlesnake Plantain	*Goodyera pubescens*

NOTES

Names: _____

# MARITIME FOREST FIELD OBSERVATIONS: SPECIES POPULATION DISTRIBUTION

50-FOOT SQUARE QUADRAT STATIONS (Map location of 4 different species for each quadrat - use a symbol for each species)

STATION 1	STATION 2
STATION 3	STATION 4

MARITIME FOREST FIELD OBSERVATIONS: SPECIES DESCRIPTIONS

COMMON NAME	IDENTIFYING CHARACTERISTICS	LEAF SHAPE	SEED	BARK	COLOR	ODOR	OTHER
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

*USE THE OTHER SIDE FOR FIELD NOTES & DETAILED SKETCHES
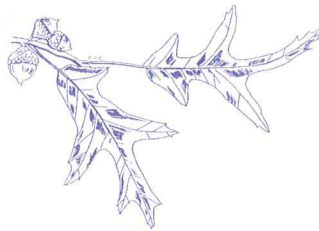
SOUTHERN RED OAK OR SPANISH OAK
Quercus falcata
Grows 50-ft to 60-ft.

Medium-size tree with rounded crown. Bark thick, furrowed with scaly
ridges, dark reddish brown to nearly balack. Inner bark yellowish. Leaves
5-in. to 7-in., shiny, dark gren above, downy underneath, variable in
outline, usually deeply cut to form 3 to 7 bristle-tipped lobes. terminal
lobe often longer and narrower than other, itself often shallowly 3-lobed.
Acorn small, 1/2-in., egg-shaped to round, in thin, short-stalked
cup covered with reddish scales.

–A Field Guide to the Pine Barrens
of New Jersey by Howard P. Boyd