

Scrub Diversity Study

Grade Level: 6th - 12th Grades, Adapt for 4th - 5th

Subject: Science, Math

Duration: 35 Minutes

Materials: clipboard, pencil, scrub diversity data sheet,
six 3'x3' PVC plot markers, plant
identification books



NGSSS: SC.D.2.3.1, SC.D.2.3.2, SC.F.2.3.4, SC.G.1.3.2, SC.G.1.3.3, SC.G.2.3.4,
SC.H.1.3.4

Overview: In this field study teams of students will survey six predetermined meter-square study plots of scrub restoration habitat to determine species diversity. Special attention is paid to species associated with scrub habitat and habitat suitable for population by scrub jays. This allows students to see and understand the process of habitat restoration through hands-on data collecting. Students also distinguish between native and non-native plants.

Objectives: Students will discover how the Florida scrub habitat is significant to local ecology and why habitat restoration is a worthwhile land management effort. Students will understand that habitat restoration is critical to the survival of the scrub jay species.

Background: Florida scrub is a very old ecosystem found on coastal and ancient inland dunes throughout the state. The Central Florida Ridge, which extends about 100 miles south to north from Venus through Lake Wales to Clermont, has been around since the early Pleistocene (approximately one million years ago). Other parts of Florida, such as the small scrub found here at Rye Wilderness, have been above sea level for only a few thousand years.

While much of Florida is very flat, low, and wet; Florida scrub is relatively high (sometimes more than 200 feet above sea level), dry, and desert-like. The scrub at Rye Wilderness Parks sits at 35 feet above sea level. Scrub soils consist of almost pure sand. Soils throughout Florida are sandy, but contain rich organic materials as well. Because scrub soils lack this organic component, only plants that have adapted to these dry conditions and low nutrient levels can survive.

Around the Bend Nature Tours Study Scrub Diversity Study (continued)



Historically, wild fires started by lightning strikes periodically burned, yet regenerated patches of the Florida scrub. Scientists believe that lightning fires were started in the scrub about every 5-25 years. These regularly occurring fires swept across the landscape in erratic patterns, keeping scrub relatively low and open and ensuring a mosaic of scrub that varied in stages of growth.

Florida scrub has a very distinct plant community dominated by shrubs and dwarf oak trees, with an occasional pine mixed in. Other plants typically found in scrub include low palmettos, hickories, and Florida rosemary. Scattered throughout the scrub are bright, open patches of bare sand dotted with small herbaceous plants and lichens.

The combination of plants that occur in scrub varies from site to site.

- Ⓐ Sand pine scrub is sometimes open and airy or forest-like with a dense overstory of mature sand pines and a shrub layer underneath.
- Ⓑ Florida rosemary scrub is found on more excessively drained sites in nearly pure stands. Groundcover consists of gray-green lichens.
- Ⓒ Oak scrub can be dense or open.
- Ⓓ Coastal scrub can be treeless.

Some of the shrubs, small plants, and trees that live in Florida scrub occur nowhere else in the world!

Living among the plants are many animals—mammals, birds, reptiles, amphibians, insects, and spiders. Among these organisms are forty species of plants, four species of vertebrates, and at least forty-six species of arthropods that are found in Florida scrub and nowhere else on earth. These species are well adapted to life in the dry, sandy nutrient-poor scrub soil.

Around the Bend Nature Tours Study Scrub Diversity Study (continued)

Setting up the survey area:

1. Put together each of the PVC squares (six).
2. Place the PVC squares at each of the six sites flagged in the restoration area.

Suggested Procedure:

1. Discuss the diversity of wildlife. Make sure students understand that wildlife includes insects, spiders and other invertebrates, birds, fish, reptiles, mammals and amphibians, in addition to plants.
2. Instruct students to calculate diversity for plant species and to only count the plants within the study plot.
3. Complete scrub diversity worksheet by making observations and recording what plant life you see in each of the study plots. Use the plant identification books to help with the specific names and descriptions.
4. On the sheet provided, list each different type of plant encountered in the study plot. Then, indicate the number of each type of plant present.
5. Tally the total number of plants and the total number of different plants present in each study plots.
6. Use the following formula to determine species diversity: # of different plants/total # of plants.

	Name of Plant (or Description)	# Present
1	<i>Andropogon</i> (tall grass)	4
2	<i>Beautyberry</i>	1
3	<i>Chapman's Oak</i>	3
4	<i>Low Palm</i> (saw palmetto)	2
4	Total # Present	10

Diversity Index = #

different plants / total # of plants

$$\begin{array}{r} .4 \\ \hline 4 | 1.0 \\ \text{DI} = 0.40 \end{array}$$

(Note: Diversity Index is always less than 1.0)