

Wood Roaches for Dinner Again? The Baby Red-cockaded Woodpecker's Diet

VOCABULARY

Vocabulary in article marked in italics

Arthropods

Invertebrate animals with jointed bodies and limbs

Bole

Trunk or stem of a tree

Cavities

Hollowed sections in trees where woodpeckers make homes

Larva

Immature form of an insect, after it hatches from its egg

Nestling

A young bird that has not left its nest

Prey

An animal taken by a predator for food

Pupa

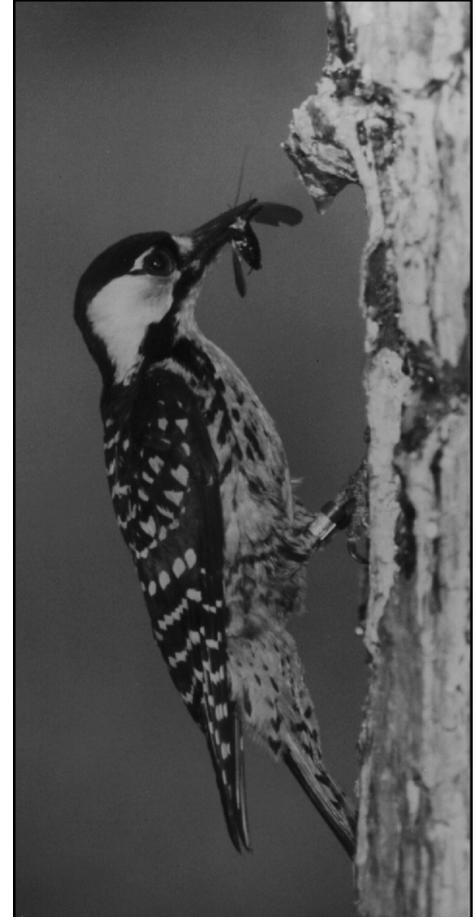
Metamorphic insect which is enclosed in a cocoon or case

Specimen

An individual or a part considered representative of the group as a whole

Scientists are often interested in studying the relationships between processes. The scientists in this study wanted to know about the relationship between insect populations and the diet of baby woodpeckers. Scientists realize that there are connections between everything in nature. Therefore, they often conduct research to better understand how plants, animals and other natural processes **vary** in relationship to each other. For example, if there is a lot of rain one year, there may be more vegetation than usual in the forest.

This vegetation provides more food for deer, who may then reproduce and survive in greater numbers than usual. Thus, there is a relationship between rainfall and the number of deer. The study of relationships in nature is called **ecology**.

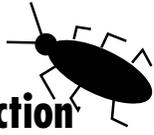


Discovery

You are a scientist who wants to find out what woodpeckers and other birds eat. Food sources are located on the bark of pine trees. Get an old bed sheet and put it under a small pine tree in the woods. Shake the tree vigorously. Collect the insects that have fallen onto the sheet. These will be used for *Further Discovery*, at the end of this article. To complete this activity you will need a copy of *A Golden Guide: Insects*.

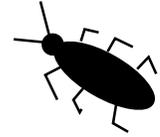
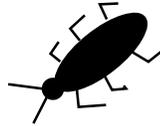
Adapted from:

Hanula, James L. and Kay E. Franzreb. 1995. Arthropod prey of nestling Red-cockaded woodpeckers in the upper coastal plain of South Carolina. *Wilson Bulletin*. 107: 485-495



Introduction

Red-cockaded woodpeckers are an endangered species that live in areas from eastern Texas all the way to the Atlantic coast. These woodpeckers prefer to live in areas where pine trees are 80 years old or older. The reason woodpeckers live in older trees is because it is much easier to make nesting *cavities*, which are hollow holes in the trees. Old trees are also an ideal place to find an abundance of food. Not much is known about what Red-cockaded woodpeckers eat. Without this information, human activities in the forest could be reducing the woodpeckers' food supply and threatening their existence even more. To help forest managers protect the woodpeckers, scientists

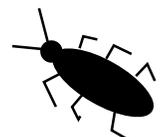


Jim Hanula and Kay Franzreb are studying what the woodpeckers feed their babies. The scientists are conducting research at the Savannah River Site in Aiken County, South Carolina to learn more about the types of *prey* that are part of the woodpeckers' diet. Little is known as to what types of *prey* the woodpeckers eat except that they find food on branches and live tree *boles*, which are the trunks of trees. Adult woodpeckers provide the best information because they feed the baby woodpeckers. Observing the adults as they feed the *nestlings* provides good information on the diet of *nestlings* without touching them.

Reflection

- 1 What are the scientists trying to accomplish by conducting this research on the Red-cockaded woodpecker?

- 2 If you were the scientists, how would you find out what the nestlings are eating?



Methods

One problem that the scientists face is that woodpeckers are difficult to study because they move very rapidly. Video cameras cannot be used because the birds are too far away and the *prey* cannot be identified. For this reason, four high-powered automatic cameras were used so that close-up pictures of the woodpeckers could be taken from a distance. The cameras were enclosed in a waterproof box with two windows through which cameras could be aimed and focused on the spot where the woodpeckers would be returning with food. The boxes were mounted on stands which were four meters tall. Each camera could take up to 250 photographs before the film had to be replaced. Are you wondering how the cameras knew when to take the pictures? Monitors were placed two meters above the *cavities* on the trunks of the trees. Invisible infrared light beams were then let out by the monitors which went down to two meters above the ground where they were caught by a device connected to the

cameras. Every time the woodpeckers crossed the beams, pictures were taken before they entered the nest *cavities*. Have you ever seen a movie where a burglar is trying to break into a bank or store? You notice that when the burglar crosses the red or blue beam, an alarm is set off and the police are alerted about the burglary. The camera is triggered in the same way. The scientists wanted to know the time and date the photographs were taken, and what bird approached the cavity. The cameras automatically marked the time and date on the photographs as they were taken. The bird that approached the cavity was identified by the color of leg band it possessed on its legs. Before the cameras were used to photograph the woodpeckers, U.S. Fish and Wildlife Service biologists placed leg bands on each of them. This information helped the scientists determine which bird was involved with feeding the *nestlings*.

Reflection

- 1 Why is it important for cameras to record the time and date the photograph was taken?
- 2 What types of prey do you think the woodpeckers gathered when they fed the nestlings?

Results

Twenty-eight different types of *prey* were identified from over 3,000 photographs (Figure 1). They consisted of *arthropods*. *Arthropods* are all the invertebrate animals that have jointed bodies and limbs. These types of *arthropods* may include beetles, ants, and spiders. There can be different stages of *arthropods* such as the *larva*, *pupa*, and adult stages. The *larvae* are the beginning stages of the *arthropod's* life span. *Pupa* are in a stage of change found in cocoons or cases, such as a caterpillar before it turns into a butterfly. Adult stages include those invertebrates that have reached a mature stage and can no longer change into another form.

Drs. Hanula and Franzreb took all the pictures to the Georgia Natural History Museum where they were able to identify the different *arthropods* by using *specimens*. *Arthropods* that were found included wood roaches, wood borer beetles, moths, spiders, ants, centipedes, insect *larvae*, and grasshoppers. These are just several types of *arthropods* that were identified.

Seventy percent of the woodpeckers' diet consisted of wood roaches. Wood borer beetles and moth larva accounted for five percent each while spiders made up four percent of the diet. As you can see, wood roaches made up a very large percentage of the diet. According to Dr. Hanula, this could be due to a very large population of wood roaches in the forest at the time of the feeding cycle which lasts from the end of May until the beginning of July. About twenty other studies have been conducted to see if the woodpeckers really rely on the wood roach for their diet, or if other *arthropods* are just as important. Most of the studies have indicated that wood roaches do make up most of the diet. Percentages may be lower in other areas but wood roaches are apparently fed to baby Red-cockaded woodpeckers most of the time.

Prey of the Red-Cockaded Woodpecker

(Percentage of Arthropods Gathered)



Figure 1: As you can see, 70% of the woodpeckers' diet consisted of wood roaches. Why might the percentage be so high?

Reflection

- 1 What might be other reasons that wood roaches are fed more than other arthropods?
- 2 What do you think forest managers can do to protect the food sources of Red-cockaded woodpeckers?

Further Discovery

Count the number of arthropods that you collected on the bed sheet. *Using A Golden Guide: Insects* try to identify the arthropods that you have collected. List or draw as many arthropods as you can identify.

1

5

2

6

3

7

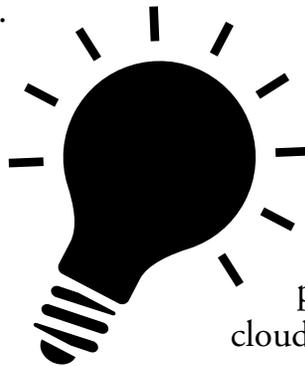
4

8

Thinking Like a Scientist

Natural resource scientists use many different skills to uncover information. One of the most important skills a scientist uses is **observation**.

Scientists observe the world around them and keep a record of their observations. Observations can be recorded with numbers (such as **counting** the number of birds at a bird feeder every day), with words (such as **writing** about the behavior of baby wolves as they grow up), or with pictures (such as **photographing** a rose every day as it blooms). You can be a scientist



too, and **record your observations** of something. For example, you can observe and record your dog's behavior at the same time every morning and evening, you can observe your classmates' interactions as they play on the playground, or you can observe the cloud patterns and weather every day.

Scientists usually wonder why or how something is or becomes the way it is. How can you think like a scientist every day?

Observe the world around you!

There's a lot to see and learn!