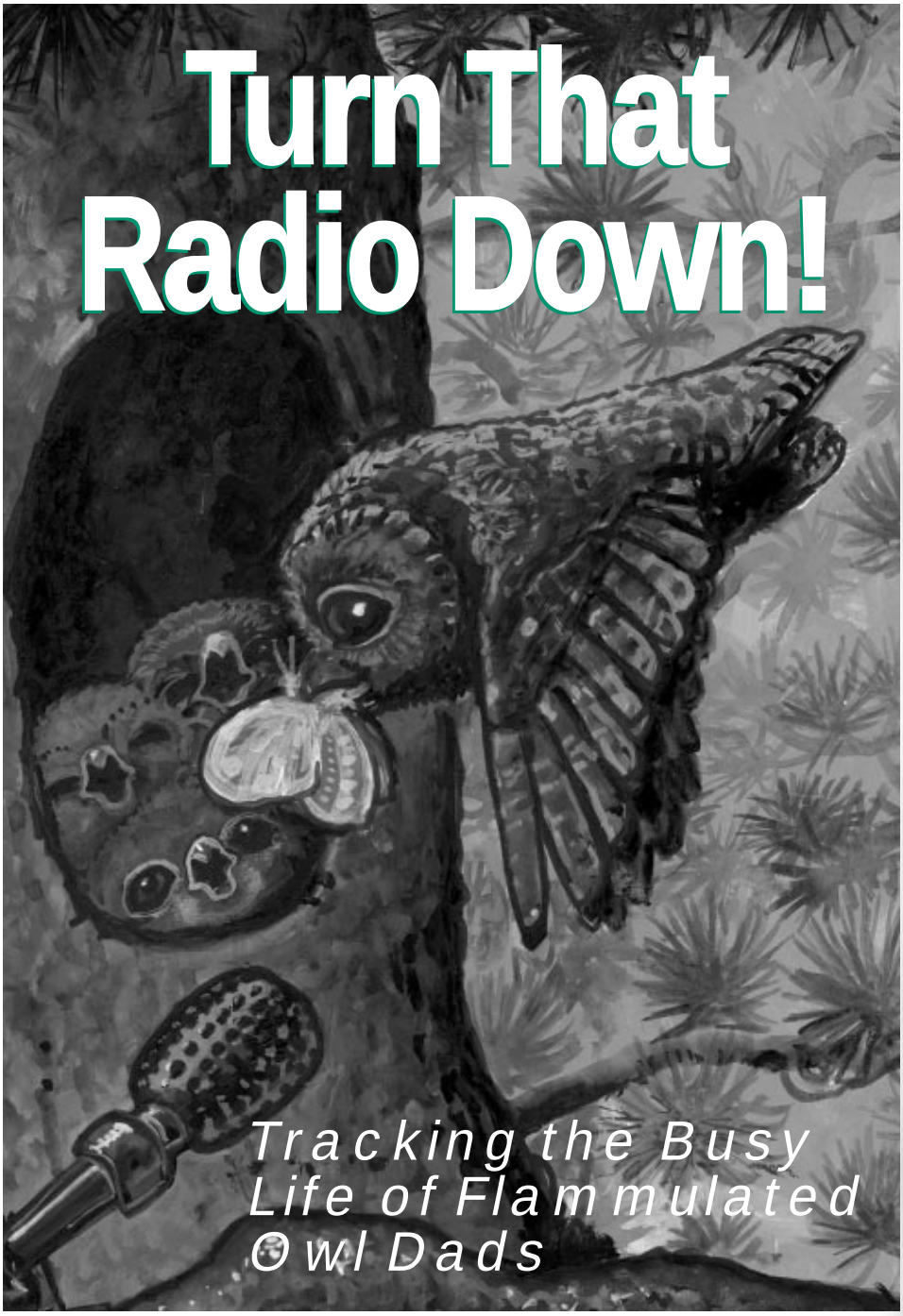
Turn That Radio Down!



Tracking the Busy Life of Flammulated Owl Dads

Meet Dr. Brian Linkhart:

I like being a scientist because it's exciting discovering new things about unusual animals, and trying to understand the needs of animals so that we may help ensure their survival in the future. I became interested in natural resources when I began spending a lot of time backpacking and fly fishing in the mountains of Colorado as a young teenager.

Dr. Brian Linkhart

Glossary:

radiotelemetry (**ra** de o tuh **le** muh tre): The process of using radio waves to record the location of animals.

cavity (**ka** vuh te): A hollowed-out space.

conifer (**kä** nuh für): A type of evergreen tree (pine, fir, spruce) that has cones.

nocturnal (**näk** tür nul): Relating to or occurring at night.

habitat (**ha** buh tat): Environment where a plant or animal naturally grows and lives.

breeding habitat (**bre** d*ing* **ha** buh tat): Environment where an animal nests and reproduces as opposed to where it lives during the rest of the year.

population (pop yoo **la** shun): The total number of individuals of a species living in an area.

forage (**for** ij): (1) Food for animals usually taken by browsing or grazing and (2) the act of taking such food.

day-roost (**da** rust): When birds with wings rest or sleep during the day.

tree crown (tre kroun): The upper green section of a tree with leaves or needles.

wildlife manager (**wi**(**uld**) lif **ma** ni jür): Skilled individual who manages natural resources for wildlife.

forest manager (**for** est **ma** ni jür): Skilled individual who takes care of natural forest resources.

Pronunciation Guide

a	as in ape	ô	as in for
ä	as in car	u	as in use
e	as in me	ü	as in fur
i	as in ice	oo	as in tool
o	as in go	*ng*	as in sing

Thinking About Science

The development of technology has been helpful to scientists who want to study animals that live in the wild. By using technology, scientists can learn about these animals without harming or interfering with the animals' normal behavior and movements. The scientists in this study used *radiotelemetry* to study the behavior and movements of Flammulated (**fla** mu la ted) owl fathers. Radiotelemetry involves attaching a small electronic transmitter to the animal. The device sends out a signal that is detected by an electronic receiver. The scientist can then identify the location of the animal, even as the animal moves from place to place in its habitat. It is important not to disturb wildlife even when we are trying to learn more about it. Technology helps scientists to do this.

Thinking About the Environment

Flammulated owls make their nests and raise their young in old *conifer* forests (Figure 1). Old forests are forests whose trees have not been cut down or disturbed for hundreds of years. In addition to large living trees, old forests have large numbers of standing dead trees. These dead trees, or

Figure 1. Old conifer forest.

snags, are preferred by owls because they can make their nests in the dead trees' *cavities* (Figure 2). These cavities are usually created by woodpeckers. The needles, limbs, and trunks of old conifers are good places to find insects and spiders, which male Flammulated owls feed to their young. Old forests, as opposed to forests composed of younger trees, are better suited to the needs of mother and father Flammulated owls. Without old forests to live in, Flammulated owls would have a hard time finding enough food to feed their young. Old forests need small fires that burn naturally on a periodic basis. When these small fires burn, they keep small brush and young trees from growing too big to compete with the older trees. You can see that there is a relationship between small, naturally occurring forest fires and Flammulated owl babies!

Figure 2. Flammulated owl in a tree cavity.

Introduction

When pairs of Flammulated owls get ready to reproduce, they must find a place to build their nest. They need a location convenient to a food supply suitable for baby Flammulated owls. The scientists wanted to know what kind of *habitat* Flammulated owls prefer to use when raising their young. Although the scientists knew generally what kind of forest these owls lived in, they did not know much about the specific area that the owls use to raise their young. They wanted to know what kind of trees were most favored by Flammulated owl parents. Flammulated owls are widespread across the Western United States, but are small and shy, and therefore hard to study. The scientists needed to develop a method to study these owls, but they did not want to disturb the owls while they studied them.

Figure 3. Flammulated owls are shy, nocturnal *small owls, about 6 inches high (smaller than a robin!). Flammulated owls eat mostly insects, capturing them by swooping down and grasping the insects with their talons (claws).*

Reflection Section

- If the preferred *breeding habitat* of Flammulated owls is not available, what might happen to the Flammulated owl *population?*

- What might cause the breeding habitat of Flammulated owls to become unavailable?

Methods

The scientists identified an area to study within a forest in Colorado where they knew Flammulated owls had been seen. For this study, the scientists focused on the behavior of the father owl. Male Flammulated owls are the breadwinners in the family! They gather insects and spiders throughout part of the night and bring them back for the baby owls to eat. The scientists waited until after the mother owl had laid her eggs. Then, male Flammulated owls were briefly captured, outfitted with a radio transmitter, and released. The scientists knew the location of the father owls throughout the day and night because they received radio signals from the transmitters. The scientists identified where the owls were located, then went to that area of the forest to observe the owls in person. They recorded what the owls were doing at the time. They sometimes used flashlights to see the owls and record the owls' behavior.

The scientists classified the father owls' behavior into four activities. These activities were: (1) *Foraging,* (2) Territorial singing, (3) Resting, and (4) *Day-roosting.* When they observed the father owls doing any of these activities, they recorded the activity and the kind of tree in which they found the father owl.

Reflection Section

- Why was it important for the scientists to accurately record the type of tree in which they found the father owl?

- Why did the scientists need flashlights to record much of the owls' behavior?

Results

The scientists were interested in the kinds of trees the father owls used while they were raising their young. While the mother owl was sitting on the nest, the father owl did three kinds of activities during the night: He foraged for food and provided it to the babies, he sang (hoo, hoo, hoo) to establish and defend his territory, and he rested. During the day, the father owl roosted. Table 1 presents the scientists' findings.

From this table, you can see that most of the father owls' activities occurred in Douglas-fir and Ponderosa pine trees. More than half the time, father owls foraged for food in Douglas-fir trees. When father owls sang to establish and defend their territory, they usually sang from the lower part of the *tree crown*, near the trunk. They only sang from Douglas-fir and Ponderosa pine trees. The work of father owls is hard; therefore, they often had to rest after they fed their young. They rested mostly in

Tree species	Percent of all trees available in the study area	Percent Foraging activity	Percent Territorial singing	Percent Resting	Percent Day-roosting
Douglas-fir	39	61	50	58	58
Ponderosa pine	29	19	50	35	26
Quaking aspen	17	9	–	1	1
Limber pine	10	6	–	6	9
Blue spruce	5	5	–	–	6
TOTAL PERCENT	100	100	100	100	100

Table 1. Percent of locations identified for each of the four activities according to the type of tree.

Douglas-fir and Ponderosa pine trees. When father owls roosted during the day, they usually selected Douglas-fir and Ponderosa pine trees. The average age of the trees used by father Flammulated owls is shown in Table 2.

The fathers usually fed their babies in the early evening. During that time, they were very busy! They usually made about 16 trips per hour to the nest. (About how many minutes did they spend foraging and delivering each meal?) Each time, they delivered only one small kind of prey, such as a spider or moth. You can see why it is important for owls to build their nests close to their food supply!

Reflection Section

- What kind of trees do Flammulated owl fathers prefer? Why do you think they prefer these trees?

- If you were a *wildlife manager,* what would you do with Douglas-fir and Ponderosa pine forests? How would you balance the needs of the owls with the needs of humans for wood products?

Implications

Father Flammulated owls are usually found in old Douglas-fir/Ponderosa pine forests. In the past, these old trees were protected naturally by frequent, small ground fires. These small fires kept brush and most of the smaller trees from growing up and competing with the larger trees. These naturally occurring small ground fires could not reach the high tree crowns, and the trunks were too big to catch on fire. The fire eventually died out on its own. Then, humans began putting these fires out rather than letting them burn. They did this because they thought they were protecting the forest, and they also wanted to protect houses and other buildings. Putting the fires out, along with cutting the big trees for wood products, has changed some of the old forests. There are no longer as many old trees for Flammulated owls to raise their young.

	Foraging	Territorial singing	Day-roosting
Average age of trees	199 years	289 years	207 years

Table 2. Average age of the trees used by father owls for three activities.

Reflection Section

- We used to think that all forest fires should be put

Whooooo Goes There?

To provide a safe way for people to reach the downhill ski area for the Olympic Winter Games of 2002, a mountain road had to be built. Forest Service biologists studied the area where the road was to be built and discovered several Flammulated owl nests. What do you think they did about this? Could they move the nests? The planners of the road did what was best for the owls. They planned the path of the road around the area of old trees where the owls had made their nests, and they planned the construction of the road around the time that the owls would be nesting. The road was longer, cost more money, and took more time to build because of the changes to protect the owls, but they saved the breeding habitat of an important bird species.

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out. We now know that some kinds of natural fires are good for the forest. In what ways could some natural fires be good for a forest and the animals that live there?

- What should the scientists do with the radio transmitters that they placed on the father owls?

FACTivity

In this FACTivity, we are going to create concept maps. Concept maps are like drawings, but they show how ideas and things are linked together. They usually start with a main idea, and then other ideas are linked by lines that show relationships to each concept. Words are also used to describe those relationships. Words that can be used include:

becomes, includes, make, for, need, is/are, has/have, release, uses, used by, with, shows, from, like, can be, cause, contain, go between, such as, release

Figure 4 shows the beginning of a concept map for Flammulated owls. It is your job to complete this concept map. You can base your concept map on what you learned from the article, as well as what you already know about owls. Some of the ideas you might add include insects, water, humans, and fire. But don't stop there! Think about all of the things that baby Flammulated owls need to live.

FACTivity adapted from: Hogan, K. (1994). *Eco-Inquiry: A guide to ecological learning experiences for the upper/elementary/middle grades.* Dubuque, Iowa: Kendall/Hunt. 1-800-228-0810. Reprinted with permission.

From Linkhart, Brian D., Reynolds, Richard T., and Ryder, Ronald A. (1998). Home range and habitat of breeding Flammulated owls in Colorado. *Wilson Bulletin,* 110(3): 342-352

Website:

http://www.fs.fed.us/rm/main/labs/flagstaff/rmrs4251.html
For more information on owls, visit www.owlpages.com/