BATS

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ing forward to learning more."

A local bat might spend the day sleeping in a hollow tree, its day roost, and leave to hunt insects when the sun goes down. When the bat tires of hunting, it rests, with other bats, in a night roost, which is in a different spot than the day roost.

Several bat species use the Forest Service's concrete bridges as night roosts. These bridges absorb the sun's warmth all day and thus remain warm all night.

"The night roost is kind of like a coffeehouse," Perlmeter said. "And the day roost is like a home where they go to spend their time."

Perlmeter is interested in finding out whether the bats that cluster under the bridges are related to each other or whether bats choose their night roosts at random.

Perlmeter plans to study this by not only counting the number of bats in the clusters under each bridge, but by capturing the bats in a particular cluster, banding them with colored plastic leg bands and videotaping returning clusters to see if similarly banded bats stay together.

Perlmeter said the information he and his students find could lead to changes in forest management practices.

"The bridges we're looking at are older bridges," he said, "and they're planned to be replaced with solid beam bridges which bats can't roost under. We want to go to the Forest Service and say, 'You've inadvertently created good bat habitat, so don't take it away.'"

Perlmeter also said if they discover that bats return to a particular type of tree for a day roost, when timber sales are made, provisions for the bats should be made as well.

"Bats seem kind of inconsequential," Perlmeter said, "but they're the number one eater of flying insects. If there aren't any bats, there'll be an increase in insects."

Perlmeter, who is completing his graduate studies at York University in Toronto, Canada, became interested in bats nearly eight years ago when he read a book on how species evolve and adapt to their environment.

"It was the kind of fine-tuning to their environment that fascinated me about bats," he said. "I started reading about bats, took a workshop on them, and just fell in love with the work. It's a good activity for someone who's an insomniac."

Oregon's bat species all belong to the order *Microchiroptera*, meaning they have hand-like wings, like all bats, and are especially small. These bats use sonar for echolocation, making inaudible high-pitched clicks and whistles that bounce off objects and enable the bat to navigate in the dark based solely on the returning echoes it hears.

"Echolocation occurs within nanoseconds (one-billionth of a second)," Perlmeter said. "The military only envies the bat because they wish they could do as good a job as the bats do."

By using a bat detector, a device about the size of a paperback book, Perlmeter and his students are able to hear the bats' calls and track them through the forest.

Bats of different species have different calls, he said. "One may sound like a rapid-fire machine gun, but the hoary bat, for example, goes 'ptt, ptt, ptt.'"

Furthermore, each bat within a species has an individual "fingerprint" to its call, which allows bats to recognize their own echolocation signal when surrounded by others of their species, like in a cave.

Because a bat can deafen itself with its cries, it disarticulates, or disconnects, the bones in its inner ear. Like humans, bats rely on three small bones in their inner ear to transmit sound vibrations and enable them to hear.

When these bones aren't touching, the bat is effectively deaf and safe from its own cries. When it becomes necessary to hear the returning echoes, the bat re-articulates the bones — up to 200 times a second.

The bats found locally include the big brown bat, which roosts frequently under bridges, and is heavier than most of the other Oregon bats. It weighs in at 17 grams (about half an ounce), as much as a single-serving bag of potato chips.

"They're my favorite bats, the big browns," Hart said. "They fit in your hand, and they're so cute.

"With the little ones, you can feel how fragile they are, but with big browns, you can move them around and show their wingspan to people. With the little ones, you have to be really careful," she said.

The big brown bats, Perlmeter said, "...can be fierce little fighters, and they're really fun to get out of a mist net when they're chomping at your finger."

On the other hand, the little brown bat is much smaller, only 5 or 6 grams. These small bats, which can often live as long as 20 years, are easily confused with hairy-winged bats, whose wings are covered on the underside with fur from their elbows to their knees, Perlmeter said.

The researchers use an assortment of equipment to catch bats, including mist nets, which are thin, cobwebby nets that are strung across creeks near the bridges where the bats roost.

"Mist nets are really notoriously bad for catching bats," Perlmeter said, because bats use echolocation to avoid them. The alternatives don't work much better, he said. Tunnel-shaped traps are really only effective at cave mouths, and butterfly nets only work in confined areas, like underneath bridges, where he and his students use them.

To see in the dark, he and his students use headlamps with red filters, because the red light is less disturbing to the bats.

They also use a headlamp that gives off infrared light, which is invisible to humans but makes the surroundings as "bright as day" when combined with a night scope. This allows humans to see in the infrared spectrum.

Once the mist nets are strung in place, as they were two weekends ago, the researchers settle down to wait, occasionally standing up to scan the darkness with bat detectors and night scopes.

Two weeks ago, when a bat finally flew into the net, someone yelled, "We've got one!" Perlmeter and Hart then went splashing through the cold, calf-deep creek to disentangle the bat.

"If I stand here long enough, my feet will just go numb and that will be that," said Joannie Humphreys, a South Eugene student who stood in the creek barefoot.

The bat turned out to be a little female brown bat, weighing 5.5 grams. It was passed around, held carefully, and released. It fluttered away quickly.

"Handling the bats was really a trip," said Thorn. "I wasn't really sure what I expected. A lot of people think 'bats' and imagine that little emblem from Batman."

Misunderstandings about bats are still prevalent, Perlmeter said. "Bats are promoted as being dark and sinister, carriers of rabies and blind, instead of beneficial to the environment."

Hart said that during her first summer working with Perlmeter, the group would travel to different sites to research bats and often ended up talking to people who stopped to watch them set up their equipment.

"One time, people thought we were saying 'bass' instead of 'bats,' and wanted to know why we were setting up nets above the water," she said.