Ear bones help researchers trace trout routes

By Jennifer Dorsey

Like a schoolgirl’s diary, an inner-ear bone in a fish records where it has been spending its days.

On Thursday at AMK Ranch, wildlife biologist Scott Carleton will talk about how that bone, the otolith, acts as an environmental recorder, what that “diary” can tell scientists about the migration of cutthroat trout in Jackson Lake and how that information might guide conservation efforts.

The idea is that by analyzing layers in the bone, which are sort of like tree rings, scientists can pinpoint where cutthroats hatched and grew up and whether they return there to spawn. With that knowledge, conservation programs can be targeted to the streams that produce the most fish.

Carleton, whose specialty is fish and bird migrations and dispersals, is with the U.S. Geological Survey. Anglers in the Jackson area may recognize him from his earlier days as a Wind River fly-fishing guide who worked out of Thermopolis.

His talk, “Prioritizing Snake River Cutthroat Trout Conservation in Jackson Lake Watersheds,” will wrap up the AMK’s 2012 summer series. A barbecue will be served at 5:30 p.m. for $5 a person; Carleton will take the mic at 6:30.

Carleton said the Jackson Lake and Snake River research began last summer with a goal of determining if an elemental signature could be found for each stream and associated with individual fish.

Layers of tissue that build up daily on the otolith, which has a different makeup than other bones, reflect the chemical content of the water a fish lives in, and that content is determined by the rocks and soil the water flows over.

Through a process Carleton describes as “science-fiction-y,” researchers lasered into the ear bones and analyzed the bone composition, specifically focusing on an element called strontium.

The geology that surrounds Jackson Lake varies “pretty dramatically,” Carleton said. As a result, “we could uniquely identify fish for each tributary.”

An alternate way of doing the same research would be to tag fish, but that would be almost impossibly labor-intensive, take many years and perhaps yield spotty results.

Fish scales can also provide life-history information, but because they fall off, big chunks of time can be missing from the record.

With otoliths, “you can really get answers you couldn’t get any other way,” Carleton said.

The research will continue next summer, focusing on adult cutthroat in Jackson Lake to see if they are returning to their juvenile homes to spawn.

Carleton’s abstract for the talk sums up the research’s ultimate goal: “This information can then be used to develop a conservation/management plan to protect the streams that are responsible for contributing to the survival of juvenile cutthroat trout in the Jackson Lake watershed that will eventually become the next generation of adult fish.”

AMK Ranch, located on the eastern shore of Jackson Lake in Grand Teton National Park, is roughly a 40-mile drive from downtown Jackson.