

the past 3 years. She compares her observations with those from a 1980 study, before the wolves returned.

The Glacier coyote population is persisting, although it "does appear to be smaller," says Arjo. "Predators do take a heavy toll." Of her original 18 subjects, 6 have been killed by cougars and 2 by wolves. Three others are unaccounted for.

She has noted other changes in the population. The coyotes have moved away from wolf territories and changed their diet, eating fewer hares and more ungulates, probably from scavenging wolf kills.

Perhaps the most interesting change is morphological. "Coyotes are bigger now," significantly so, Arjo says. The average male coyote has grown from 11.8 kilograms in 1980 to 13.9 kg. Females have grown from an average of 9.9 kg to almost 12 kg. They are longer, too—by more than 12 centimeters, on average. They may be thriving from the scavenged carcasses, or the smaller coyotes may simply have been killed.

A similar pattern will probably develop in Yellowstone, Arjo says. "I don't think the wolves will wipe out the coyotes. . . . [The coyotes will] definitely figure out who to stay away from. They're pretty flexible."



When the snow melts, coyotes fade into the grass.

It's the coyotes' flexibility that accounts for their success, the researchers say. "Wily coyote" is a pretty good label," says Gese.

He has seen their guile up close.

While studying one of the packs in the valley, "I had this sensation that something was right behind me," Gese recalls. When he eased around, he came face-to-face with one of the beta coyotes, about 5 feet away. A piece of telemetry antenna lay on the ground between them.

With golden eyes focused on the parka-clad figure, the coyote "slowly lowered his mouth, grabbed the antenna, and started backing up with it." As soon as the researcher raised his hand, the coyote dropped the antenna and walked off.

On another occasion, the scouting coyote didn't bother to sneak around.

Gese watched a young beta male break away from its pack, cross the river, and climb the hillside to where he was perched. The coyote sat down about 10 feet from Gese and seemed to watch the pack as well, Gese recalls. "After about 15 minutes, he got kind of bored, curled up, and took a nap." An hour or so later, the coyote got up, stretched, yawned, and loped back down the hill.

Coyotes will respond to anything novel in their environment, Gese says, whether a shiny piece of metal or a man.

In the Yellowstone wolves, they have both something new and something old. "Coyotes coevolved with wolves," says Crabtree. "They know how to withstand mortality. They become wary." Indeed, coyotes managed to flourish under the same intense campaign of predator control that all but eliminated wolves.

The ultimate winner of the canine competition is the Yellowstone ecosystem, Crabtree says. As in Minnesota, red foxes have appeared in the wolves' new territory, which they avoided when coyotes were in charge. Without as many coyotes, there are more small mammals available for raptors and other predators to eat.

"Coyotes will decrease," says Crabtree, "but that will cause nothing but an increase in [species] richness." □

## Biomedicine

### Appendectomy? Scan me first, Doc

For emergency room doctors, appendicitis can be a tough call. A missed diagnosis can lead to a burst appendix and complications for the patient. On the other hand, rushing to surgery can mean taking out a perfectly good appendix.

Both occur frequently. Doctors initially fail to diagnose 20 percent of appendicitis cases. As a result, missed appendectomies are the most common successful malpractice claim made against emergency room physicians, studies in the United States and Europe show. What's more, in 15 to 40 percent of appendectomies, doctors end up removing a healthy organ.

In the United States, roughly 250,000 people are treated for appendicitis each year. To improve the odds of getting it right, doctors at Massachusetts General Hospital in Boston took computerized tomography (CT) scans of 100 consecutive patients hospitalized for suspected appendicitis. The doctors had made their preliminary diagnosis on the basis of the patients' medical histories, physical examinations, and laboratory tests.

The CT scans showed that only 53 of the 100 patients indeed had appendicitis. Among the 47 people who proved to have a different ailment, the scans prevented unneeded appendectomies in 13 who had been slated for emergency surgery, the researchers report in the Jan. 15 *NEW ENGLAND JOURNAL OF MEDICINE*.

Overall, the CT scans were accurate in 98 of the 100 cases, says coauthor Patrick M. Rao, an emergency radiologist at the hospital. One CT scan missed a case of appendicitis; another identified a case falsely.

An appendix scan takes 15 minutes to perform. "Fifteen minutes is nothing in the big scheme of things," Rao says, noting that many potential appendectomy patients wait for hours in emergency rooms. Rao and his colleagues calculated the cost differential between removing a healthy appendix and having a CT scan at 16 to 1. The hospital thus saved roughly \$44,700 overall for the 100 patients.

—N.S.

### Snoring impedes blood flow in brain

Surveys have linked snoring to strokes, but they have not revealed the basis for the connection. Now, researchers report that the obstruction of air passages that makes a person snore heavily or snort while sleeping can sharply reduce blood flow to the brain, possibly boosting the risk of stroke. Episodes in which air inflow is obstructed by more than 50 percent coincided with blood flow reductions of more than 50 percent in three-fourths of snoring episodes monitored, researchers report in the January *STROKE*.

To study the effects of snoring on blood flow, Kingman P. Strohl of Case Western Reserve University in Cleveland and his colleagues fitted 11 men and 1 woman with head gear that recorded their snoring patterns and the blood flow in their middle cerebral artery. The researchers found that obstructive apnea, in which a sleeper snores with abrupt snorts and pauses, and obstructive hypopnea, which causes heavy, long, loud snoring, decreased blood flow to the brain in 80 percent and 76 percent of incidents, respectively.

Both snoring conditions arise from upper airway obstructions that prevent the lungs from filling properly. This can create pressure inside the chest and on the heart, impeding blood outflow, says pulmonologist Strohl. The longer the snore, the greater the reduction of blood flow, his team found. Strohl likened the feeling to trying to breathe with a hand over one's mouth and nose. "It's this effort that causes lack of blood flow," he says.

While the reduced blood flow and later upsurge of blood to the brain after the obstruction clears seem to identify a risk pattern for strokes, no cause and effect has been proved, Strohl says. Surgery and other treatments can cure some snoring, but Strohl cautions that research with more snorers is needed to link snoring and stroke definitively.

—N.S.