Aerial wolf hunts resume in Alaska

Alaska state game managers were scheduled to begin an aerial wolf hunt on Nov. 1 to cut predation on caribou and moose herds, after an environmental group filed a suit to block the hunt last year. The state's Board of Game voted 4 to 2 to resume the hunt as a way to increase the caribou and moose that Alaskans hunt for food and sport.

The hunt lays open conflicting views of wildlife management. The Alaska Department of Fish and Game defends the practice it has used since 1976 (except for last year) as a management technique that favors human use of the caribou and moose by reducing the number of gray wolves. Environmentalists oppose the "single species management" that artificially controls one species to benefit others.

Biologist Al Manville of Defenders of Wildlife in Washington, D.C., says the practice is "biologically unsound" because it is based on the belief that wolves control the dynamics of caribou and moose populations. Instead, Manville says that poachers, bears, habitat loss and harsh winters have contributed to fluctuations in herd numbers.

Samuel Harbo, a board member who voted in favor of the hunt, says that severe winters reduced moose populations but wolf predation kept the herd from recovering, and that the state control is really a form of ecosystem management. "I think what we're doing in some of these areas is recognizing that the consumption of prey by humans is the priority wildlife use, and we're managing accordingly," says Harbo, who is a professor in the wildlife management program at the University of Alaska in Fairbanks.

The control plan calls for at least 244 wolves to be killed by 1987. Harbo says that Alaska's population of 6,000 to 10,000 wolves is not threatened by the killing as long as it is managed by the state.

But Defenders of Wildlife President Allen Smith notes that in Minnesota, wolves were being killed in predator control programs only two years before the state moved to protect them under the Endangered Species Act. "It seems we need to destroy it down to the endangered level to get a legal handle," says Smith. Wolves are not listed as endangered in Alaska as they are in the contiguous states except Minnesota, with the largest wolf population south of Canada, which lists the wolf as threatened.

The Alaska board approved the hunting in an effort to eventually double moose numbers within 15,400 square miles near Fairbanks. Members will vote in December on extending the control to other areas; conservation groups are now working to prevent that extension. —*C. Mlot*

Sister star scenario: Sound or shot?

What one scientist calls a "completely healthy theory" another says is "pretty well shot." Both are responding to the same four papers published in the Oct. 18 NATURE that delve into some of the finer details of the Nemesis theory, proposed last spring to explain the occurrence of periodic extinctions — every 26 million years — of life on earth over the last 250 million years covered by the fossil record.

Scientists have postulated that the sun has a sister star, Nemesis, named after the Greek goddess of doom. As the scenario goes, Nemesis, in its orbit around the sun, periodically unleashes deadly comets on earth that stir up dust and alter the environment so dramatically that whole species vanish from the globe (SN: 4/21/84, p. 250). Every 26 million years when Nemesis is closest to the sun, the comets are dislodged by the star's gravitational field from the Oort cloud, a ring of solar system debris orbiting the sun far beyond the paths of the planets.

Debate about the Nemesis idea has become rather fiery. In his commentary in NATURE, Mark Bailey of the University of Manchester in England writes that the recent papers constitute a "near-retraction." But Piet Hut, one of the authors, told SCIENCE NEWS, "That's really outrageous and irresponsible. The paper I sent in clarifies the picture and does not retract it at all."

The purpose of the recent papers was to explore in greater detail the dynamics of all the possible orbits a star like Nemesis might follow if it were to exist. By finding the most physically reasonable orbits, these theoretical calculations test the plausibility of the Nemesis concept. The results of the recent work show that the possible Nemesis orbits are not terribly stable, because the star, traveling far from the solar system, is weakly bound to the sun and is vulnerable to jolts from the gravitational pull of other bodies.

Michael Torbett at Murray (Ky.) State University and Roman Smoluchowski at the University of Texas at Austin calculated the changes in the possible trajectories of Nemesis due to the galactic tide, the net gravitational tug from the mass outside the solar system. They report that the most stable orbits are those that lie within 30 degrees of the plane of the galaxy and travel in a direction opposite that of the planets. However, says Torbett, even the most stable orbits can't last the entire age of the solar system, 4.6 billion years. Most researchers agree that the expected lifetime of the star in an orbit with a period of 26 million years is, at most, a billion years.

This means one of two things: Either the star was captured by the solar system long after the sun formed, an event with an extremely low probability; or, as Hut at the Institute for Advanced Study in Princeton, N.J., proposes, Nemesis was more tightly bound — with a period of about 1 million to 5 million years — when it and the sun were born, and has been nudged out to its present orbit by gravitational tugs from passing stars or other bodies. These nudges, Hut says, will eventually lead to the star's escape from the grasp of the sun.

As for the last 250 million years covered by the fossil record, Jack G. Hills at Los Alamos (N.M.) National Laboratory incorporates the effects of random passing stars on Nemesis's orbit and estimates that the period of the star should have changed by 15 percent over this time span. The stability is also threatened by massive molecular clouds, which are just now being addressed. Hut maintains that their effect is at most comparable to those of passive stars; Torbett thinks it is much more dramatic.

In any event, all the perturbations on Nemesis's possible orbits mean that the astronomical clock is not precisely tuned, and if the star exists, one should not expect it to trigger comet showers and mass extinctions with perfect periodicity, say Hut and others. Unfortunately, without better geological data, especially the dates of craters, the uncertainties in the terrestrial evidence are too large to say exactly how strictly periodic the Nemesis clock must be.

These uncertainties are also at the root of an upcoming exchange of letters in NATURE between Hut's group and Paul R. Weissman of the Jet Propulsion Laboratory in Pasadena, Calif. Weissman maintains that the cratering rate predicted by Nemesis is at least 5 to 18 times greater than that actually observed on the earth and the moon. In a separate paper, Weissman also suggests that asteroids, not comets, formed the craters, in which case neither Nemesis nor any other astronomical theory could explain the periodicity in extinctions or crater formation.

Hills also notes that putting Nemesis in a tighter original orbit, as Hut suggests, increases the likelihood that it intruded into the solar system, stripping off planets from the solar system and generally wreaking havoc. Since this is not thought to have happened, comments Hills, it makes the theory less attractive, but still tenable.

"The main thing right now is for the observers to find that creature," Hills says. Whether it's a star, a black dwarf or even a planet, its mass — which Hills estimates is at least 10 times the mass of Jupiter — is large enough to be seen among the 200,000 objects in the Infrared Astronomy Satellite catalog. The recent findings at least give scientists a better idea of where to hunt. —*S. Weisburd*

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