

One scientist's hobby: recreating the ice age

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In this photo taken Oct. 23, 2010 Russian scientist Sergey Zimov talks about mammoth bones he has collected in this remote area of northeast Siberia. Zimov has stacked the bones on a barge in the river near the Northeast Science Station, which he directs, in the town of Chersky, Russia. Zimov believes mammoths, woolly rhinos and other Ice Age animals became extinct after human hunters killed too many to maintain the delicate balance between the animals and the grasslands that fed them. (AP Photo/Arthur Max)

(AP) -- Wild horses have returned to northern Siberia. So have musk oxen, hairy beasts that once shared this icy land with woolly mammoths and saber-toothed cats. Moose and reindeer are here, and may one day be joined by Canadian bison and deer.

Later, the predators will come - Siberian tigers, wolves and maybe leopards.

Russian scientist Sergey Zimov is reintroducing these animals to the land where they once roamed in millions to demonstrate his theory that filling the vast emptiness of Siberia with grass-eating animals can slow global warming.

"Some people have a small garden. I have an ice age park. It's my hobby," says Zimov, smiling through his graying beard. His true profession is quantum physics.

Climate change is felt most sharply in the Arctic, where temperatures are warming faster than anywhere else on the planet. Most climate scientists say human activity, especially industrial pollution and the byproducts of everyday living like home heating and driving cars, is triggering an unnatural warming of the Earth. On Monday, negotiators representing 194 countries open a two-week conference in Cancun, Mexico, on reducing greenhouse gases to slow the pace of climate change.

Zimov is trying to recreate an ecosystem that disappeared 10,000 years ago with the end of the ice age, which closed the 1.8 million-year Pleistocene era and ushered in the global climate roughly as we know it.

He believes herds of grazers will turn the tundra, which today supports only spindly larch trees and shrubs, into luxurious grasslands. Tall grasses with complex root systems will stabilize the frozen soil, which is now thawing at an ever-increasing rate, he says.

Herbivores keep wild grass short and healthy, sending up fresh shoots through the summer and autumn. Their manure gives crucial nourishment. In winter, the animals trample and flatten the snow that otherwise would insulate the ground from the cold air. That helps prevent the frozen ground, or permafrost, from thawing and releasing powerful greenhouse gases. Grass also reflects more sunlight than forests, a further damper to global warming.

It would take millions of animals to change the landscape of Siberia and effectively seal the permafrost. But left alone, Zimov argues, the likes of caribou, buffalo and musk oxen multiply quickly. Wherever they graze "new pastures will appear ... beautiful grassland."

The project is being watched not only by climate scientists but by paleontologists and environmentalists who have an interest in "rewilding."

"This is a very interesting experiment," said Adrian Lister, of the Natural History Museum in London. "I think it's valid from an ecological point of view to put back animals that did formally live there," he told AP Television News. He disapproved of suggestions to rewild nonnative species - for example, relocating elephants and rhinos to the American plains.

Zimov began the project in 1989, fencing off 160 square kilometers (40,000 acres) of forest, meadows, shrub land and lakes. It is surrounded by another 600 square kilometers (150,000 acres) of wilderness.

It is an offshoot of the Northeast Science Station, which he founded and where he has lived for 30 years. Already icebound by October, the park is 40 kilometers (25 miles) inland from the station, accessible only by boat in summer and by snow vehicles after the rivers freeze.

A 32-meter (105-foot) tower inside the park gives constant readings of methane, carbon dioxide and water vapor. The data feeds into a global monitoring system overseen by the U.S. National Oceanic and Atmospheric Administration.

Zimov's research on permafrost, greenhouse gas emissions and mammoth archaeology has attracted world scientists to his laboratories, a small cluster of cabins and a tiny chapel on a rocky bluff above a

channel of the Kolyma River. A 20-bed barge is used for field trips in summer, and a \$100,000 hovercraft is on order. Zimov sometimes uses an old Russian tank to bring supplies from the Chinese border, 2,000 kilometers (1,200 miles) away.

Part of the station's attraction - and deterrence - is its remoteness. It is 6,600 kilometers (4,000 miles) and eight time zones east of Moscow. The nearby town of Chersky, with some 5,000 people, has few amenities, and the nearest city, Yakutsk, is a 4-1/2 flight. Many researchers, particularly Americans, prefer to work in Alaska or northern Canada, which are more accessible.

"Most of the Arctic is in Russia, and yet most of the Arctic research isn't," said Max Holmes, of Woods Hole Research Center in Massachusetts, director of the Polaris Project, which has sent undergraduates to the station for the last three summers.

Zimov started the park with a herd of 40 Yakutian horses, a semi-wild breed with a handsomely long mane that is raised by Yakuts and other native people for their meat. Short, sturdy and broad-backed, they survive harsh Siberian winters with the help of a furry hide, thick layers of fat and the ability to paw through a meter (3 feet) of snow to forage.

Of his first herd, Zimov said 15 were killed by wolves and bears, 12 died from eating wild hemlock that grows in the park, and two slipped through the perimeter and made their way back some 1,000 kilometers (600 miles) to their original pastures.

But he bought more. Now the horses have learned to avoid poisonous plants and to resist predators. Over the last three years, more colts were born and survived than horses lost.

The challenge is to find the right balance between grazers and predators,

and how to help his animals get through their first winters.

His workers still give occasional buckets of grain to the horses to supplement their diet with salt. About half the horses come regularly to the cabin where a caretaker stays year-round. The other half are rarely seen except for their tracks.

Zimov also has had problems with the moose that he brought inside his enclosure. Moose still live in small numbers in surrounding forests, and the males jump back and forth over the 6-foot-high fence.

In September he traveled to a nature reserve on Wrangel Island, about five hours by boat across the East Siberia Sea, and brought back six 4-month-old musk oxen. One died a few weeks later. The others are kept in a small enclosure and fed hay until they can fend for themselves.

His objective is to see whether a thriving population of grazing animals will regenerate grasslands that disappeared long ago, which would slow and even halt the accelerating pace of permafrost thaw. So far, he says, the results are encouraging.

Today he has 70 animals in the park. He wants thousands to restock Siberia. To bring 1,000 bison from North America would cost \$1 million, Zimov says, a small price to pay.

"If permafrost melts, 100 gigatons of carbon will be released this century," he said. "What's \$1 million? One regular grant."

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