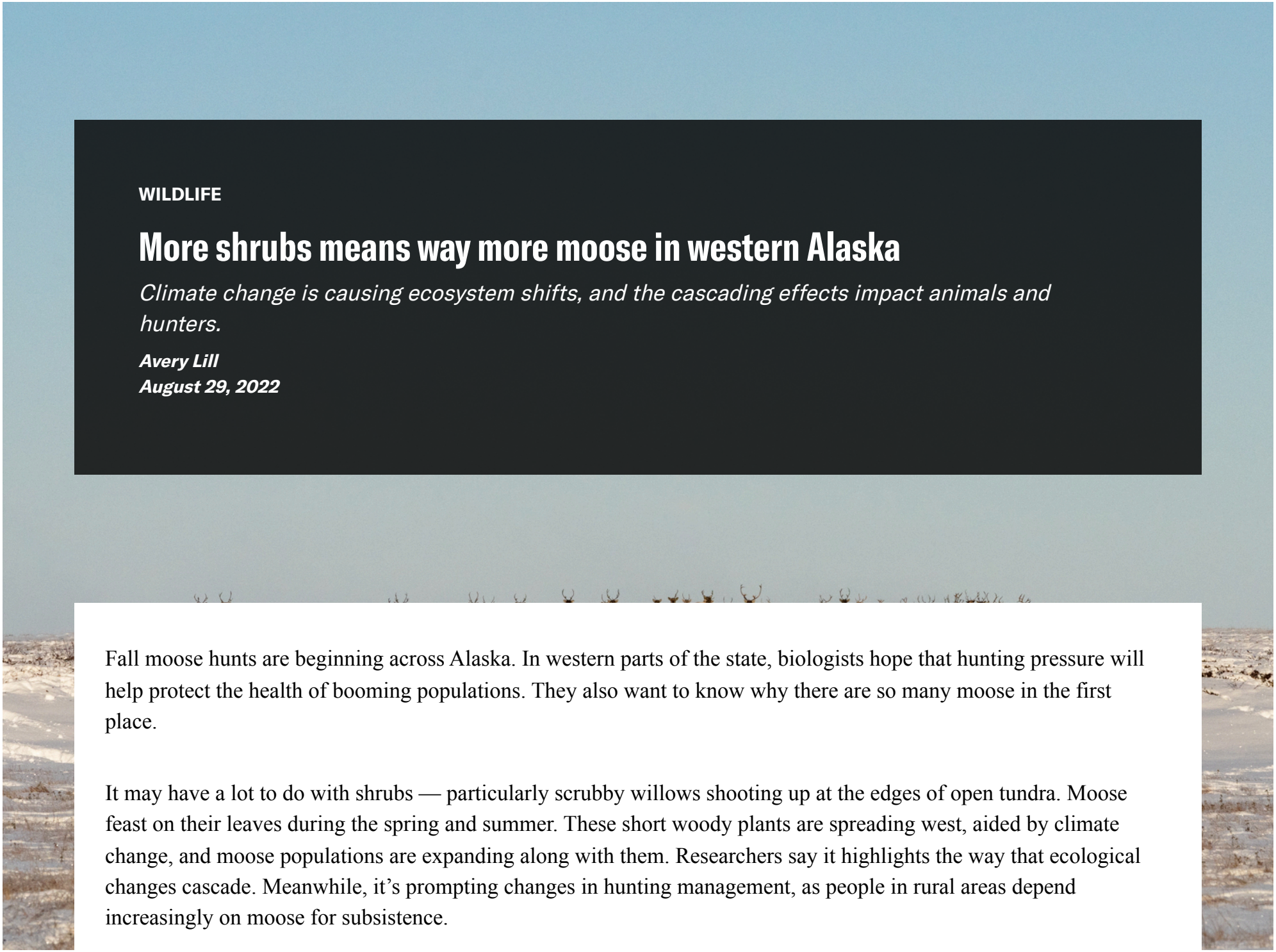

WILDLIFE

More shrubs means way more moose in western Alaska

Climate change is causing ecosystem shifts, and the cascading effects impact animals and hunters.

Avery Lill
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Fall moose hunts are beginning across Alaska. In western parts of the state, biologists hope that hunting pressure will help protect the health of booming populations. They also want to know why there are so many moose in the first place.

It may have a lot to do with shrubs — particularly scrubby willows shooting up at the edges of open tundra. Moose feast on their leaves during the spring and summer. These short woody plants are spreading west, aided by climate change, and moose populations are expanding along with them. Researchers say it highlights the way that ecological changes cascade. Meanwhile, it's prompting changes in hunting management, as people in rural areas depend increasingly on moose for subsistence.

The shrub spread appears to be caused by warming temperatures and the loss of snowpack in the Subarctic. Rick Thoman, a climate specialist with the International Arctic Research Center at the University of Alaska Fairbanks, said that spring in southwest Alaska has changed substantially, with snow melting earlier as temperatures rise. In the Yukon-Kuskokwim Delta, for example, the average springtime temperature has increased by more than 4 degrees Fahrenheit between 1972 and 2021. “That’s of course critically important for vegetation, because the earlier you can start to grow, the more you’re going to grow, in a Subarctic environment,” said Thoman.

Shrub expansion across the tundra, sometimes called “shrubification,” is visible from space: In satellite images, areas dominated by shrubs are greener than open tundra during the summer. Researchers track shrubification by comparing the greenness of images across the years. Shrubs have been **proliferating in the rapidly warming global Arctic** since at least the 1980s, and recent research shows that they are expanding in tundra **below the Arctic Circle** as well.

A moose near Newtok, Alaska, in the Yukon-Kuskokwim Delta.
Katie Basile

For moose in western Alaska, it's been a boon. Their populations have swelled to **record numbers** in parts of the Yukon-Kuskokwim Delta and in the nearby Togiak National Wildlife Refuge. "From the early '90s to now, we've seen at least a 400-fold increase in the moose population (in the refuge), which has tremendous effect on the environment," said Sebastian Zavoico, a master's student at the University of Alaska Fairbanks. A rise in moose predators, including

bears, could be among the possible consequences. There might also be physiological changes to the shrubs moose eat. Willows **can produce chemicals** that make them less nutritious for moose as a defense.

“From the early ’90s to now, we’ve seen at least a 400-fold increase in the moose population (in the refuge), which has tremendous effect on the environment.”

Zavoico is **studying changing moose demographics** in the refuge. He’s found that when summer vegetation does well, so do moose: They give birth to more twins, and more calves survive. Satellite data shows that the refuge has grown significantly greener in the last two decades. That confirms what people who live in the refuge have told Zavoico: “Shrubs, which are the main moose food, have just exploded.”

But Zavoico is careful not to equate correlation with causation. For years, hunting and habitat management have aimed to boost moose populations in the refuge. Still, he said, the fact that moose are expanding in other western areas of the state suggests that climate change is also propelling the population boom. “It’s important to understand why (moose have) been expanding in the past so that we can better manage for the future,” Zavoico said.

Students learn subsistence skills while butchering a moose at Ayaprun Elitnaurvik, a Yup'ik immersion charter school in Bethel, Alaska. Subsistence hunting is vital both culturally and economically in rural areas.
Katie Basile

THE MOOSE BOOM has huge implications for communities in the region that rely on the animals for subsistence. One moose can supply more than 500 pounds of meat, which is usually divvied up between several freezers as hunters share the bounty with family, friends and elders. It's vital both culturally and economically, because it can help offset

the high cost of groceries in rural areas. And moose hunting is increasingly important as numbers of caribou, another important subsistence animal, have declined steeply in this area in recent years.

The Mulchatna caribou herd in southwest Alaska is a traditional food source for villages from the Yukon-Kuskokwim Delta to Bristol Bay. For several years, however, the herd's numbers have fallen below half the minimum population objective of 30,000 individuals.The Togiak National Wildlife Refuge and the Alaska Department of Fish and Game **canceled last year's fall caribou hunt**. There won't be one this year, either.

Biologists suspect that the decline is caused by a combination of factors, including disease, overhunting and increased predation by wolves and bears, **according to public radio station KYUK**.

Whatever the cause of the caribou decline, more people are relying on moose to stock their freezers. "In procuring lots of meat efficiently, moose are kind of your best bang for the buck, but also because the caribou population does not have any harvest available at this time, there's a lot more people putting a lot more importance on the fall (moose) hunt," said John Landsiedel, an Alaska Department of Fish and Game wildlife biologist for the west side of Bristol Bay.

Caribou from the Mulchatna herd graze near Eek Lake in the Yukon-Kuskokwim Delta. With a decline in some caribou populations, more people are relying on moose to stock their freezers.
Katie Basile

This fall and winter, bag limits for local hunters are more liberal than usual in parts of Bristol Bay and the Yukon-Kuskokwim Delta: These hunts will allow people to harvest two moose each, and some of the harvested animals can be "antlerless," or female. This could help moose as well as people: Managers don't want the moose populations to

outstrip the capacity of their winter food sources. “Antlerless harvest only occurs where … you’re trying to bring that population back down to a level that biologists have determined is more sustainable on the landscape,” said Landsiedel.

Last winter in the lower Yukon, the Federal Subsistence Board **increased the limit for local hunters** to three moose each at **the request of the Yukon Kuskokwim Delta Subsistence Regional Advisory Council**, which was concerned about a potential moose population crash. The council also said that **low salmon runs in the region** and the decline of the Mulchatna caribou herd underscore the urgency of the local moose hunt.

However, moose population trends are not uniform across Alaska’s southwest. Just east of the Togiak National Wildlife Refuge, moose numbers are dropping, mostly because bears are preying on calves. In that area, Choggiung Limited, an Alaska Native Corporation, has restricted hunting on land it owns near Dillingham, Alaska, to improve subsistence opportunities for its shareholders. For the second year in a row, it is **reserving hunting big game animals** — including moose — on portions of its property for its shareholders, with exceptions for other Alaska Native people, family members and proxy hunters.

“The bigger game is their primary meat for winter, so we’re trying to give the shareholders of our organization a little bit better opportunity to find big game,” said Mark Bielefeld, Choggiung Limited’s land manager. “We are stewards of this land. … It’s our future generations’, and we’re trying to uphold it for the future.”

Avery Lill is an Alaska-based staff writer for High Country News *focusing on land and the environment in Alaska. Email her at avery.lill@hcn.org or submita **letter to the editor**. See our **letters to the editor policy**.*

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