Munching away at an ecological menace: Grazing, when well managed, can restore ecosystems

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by Suzanne Bohan, Staff writer

ANTIOCH — The Antioch Dunes National Wildlife Refuge is about all that remains of the San Joaquin River dune system. The once-extensive ecosystem was mined for its sand and fractured by development.

For the Lange's Metalmark butterfly, the site is its last refuge, along with 12 adjacent acres. The 55-acre preserve was set aside in 1980 largely to protect the butterfly, listed as a federally endangered species.

Next spring, more help will arrive for the imperiled butterfly, in the form of 10 grass-loving cattle.

While the fence surrounding the refuge keeps out trespassers, it can't stop nitrogen from settling on the land. The element, a potent fertilizer, is transforming the remnant of this sandy dune system into a hilly grassland.

While Christy Smith, manager of the Antioch Dunes refuge, isn't certain where the nitrogen is coming from, she knows it's fueling the invasion of grasses, which is driving out buckwheat, a native plant the Lange's Metalmark depends on for survival.

"One way or another, we have nitrogen out there, which is increasing our problem," Smith said. Without nitrogen, the grasses couldn't possibly grow on the nutrient-deficient sandy soil.

The Antioch Dunes evening primrose and the Contra Costa wallflower also only grow in and around the refuge, and are jeopardized by the grassy invasion.

Louis Terrazas, an officer at Antioch Dunes National Wildlife Refuge, inspects some nude stem buckwheat (foreground), an endangered species at the refuge. (Ron Riesterer, Staff photos)

The refuge is located in an industrial area. "It could very well be from the traffic," Smith said, referring to nitrogen compounds released from fuel combustion.

Stuart Weiss, a Menlo Park scientist and expert on nitrogen deposition, strongly suspects that nitrogen deposited from nearby traffic is fueling the grasses' growth.

Volunteers weed the grasses, but it's too enormous a task for a volunteer crew to maintain.

Smith said machines have been used to eliminate the invaders, but that disturbs the dune system too much.

So next spring, Smith will try a method that's worked elsewhere to control the nitrogen-fueled spread of non-native grasses: Bring in the bovines.

Cattle like the grass, which is more nutritious because it absorbs some of the nitrogen — a building block of protein —

said Stephanie Larson, a range management expert with University of California, Davis, who's assisting with the Antioch Dunes pilot grazing project.

The land manager will fence off two five-acre plots, and five cattle will be let loose inside each plot for a few months at the start of the growing season, Larson said. That should give the native buckwheat an edge in reclaiming the dunes.

It worked at Coyote Ridge in San Jose, where studies show that nitrogen from vehicle exhaust settled on the land and allowed invasive grasses to take over, Weiss said.

On one side of a fence on the land, cattle grazed on the non-native grasses and the short native flowering plants rebounded. On the opposite side of the fence, no cattle grazed and only a few native plants survived amidst the tall grasses.

Weiss said the results turn thinking on its head about the ecological effects of cattle grazing.

"Cattle are actually pretty good for the environment," he said.

Larson agreed that in the past, cattle grazing earned a reputation for degrading land.

"Historically, grazing was not well done," she concurred. "But rangeland management is improving. We're looking at it from an ecological perspective."

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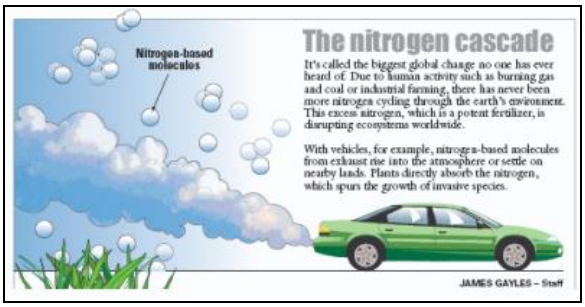

At a Glance

It may not be the *Kyoto Protocol*, but the *2004 Nanjing Declaration on Nitrogen Management* guides nations in establishing sustainable uses of nitrogen, a potent fertilizer that's disrupting ecosystems worldwide.

Some of its recommendations to governments:

- Support research on the health and environmental consequences of excess nitrogen.
- Create policies for using fertilizer far more efficiently, as most of it is wasted.
- Support research for reducing nitrogen levels released during combustion of fossil fuels.

Simple steps to reduce your own "nitrogen footprint":

- Drive slower — higher speeds increase nitrogen emissions.
- Drive a fuel-efficient car.
- Eat less meat and animal products, as animal waste is a major contributor to nitrogen pollution.

Source: MediaNews Group research