

## Elephant seal birth defects due to near-extinction

Carolyn Jones

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With her dewy brown eyes, velvety fur and glossy whiskers, TVA is a lovely specimen of an elephant seal.

Except for the hunchback.

The month-old pinniped - rescued in Tennessee Cove, part of Marin County's Tennessee Valley Authority, and now undergoing treatment at the Marine Mammal Center in Sausalito - has an extra vertebra in her spine, bulging into a pronounced hump on her blubbery back.

Several of her compatriots at the center also have birth defects - cleft palates, scoliosis, extra brain lobes. For years, staff puzzled over why elephant seals have a rate of deformities more than twice that of harbor seals and 10 times higher than sea lions.

Now they think they have the answer: inbreeding.

All 150,000 elephant seals alive today are descended from the 20 or so that survived rampant hunting a century ago. The limited gene pool - and the problems associated with breeding with one's close relations - has led to a slew of physical deformities that might take a millennium or more for the species to recover from.

"What we're seeing is a species re-evolving," said Dr. Bill Van Bonn, director of veterinary science at the center. "Elephant seals have been around for millions of years and then suddenly there was a genetic bottleneck. It's fascinating to observe."

The center is participating in the first study of elephant seals and genetic defects, tracking the rate and severity of deformities so scientists in the future can have a baseline for comparison. Researchers expect to publish the results next year.

### Health not just numbers

The upshot is that even though elephant seals have made a speedy recovery from near-extinction, the species is far from healthy. Numbers alone cannot measure the species' overall success, scientists said.

"It's tempting to drop protections for animals when they start to rebound, but the negative effects of near extinction aren't always so obvious and can last a long time," said Patrick Robinson, a postdoctoral researcher in UC Santa Cruz's Ecology and Evolutionary Biology Department.

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He's among the scientists working with UC Santa Cruz biologist Dan Costa to study and track elephant seals. Costa said he's seen no evidence of a high rate of deformities among elephant seals, but his group is studying the species as a whole.

The Marine Mammal Center, by contrast, sees the sick and injured animals and is more likely to come across abnormalities. Those left in the wild likely just die.

Deformities aren't the only problems elephant seals have to worry about. Because they all have the same or very similar genes, they're more likely to be wiped out by disease. If one elephant seal is susceptible to a certain pathogen, they're all likely to be susceptible, Robinson said.

Scientists are seeing signs of weakened physiologies - specifically, emaciation - this spring at the Marine Mammal Center. This week, the center was treating 70 elephant seals, mostly pups suffering from emaciation, as opposed to 40 at this time last year.

Elephant seals once honked and cavorted in great numbers throughout the northern Pacific Coast, especially in Central California, until people began pouring into the region in the late 1800s.

### **Hunted to the brink**

The seals were easy prey for hunters because they weren't particularly afraid of people. They were hunted for their blubber, which was used for lamp oil.

By 1910 only about 20 remained, all living on an island off the coast of Baja California. Habitat conservation, hunting bans and laws prohibiting their disturbance have all helped *Mirounga angustirostris* recover.

Not all elephant seals with deformities appear bothered by them. Marine Mammal Center staff said some appear to swim and hunt perfectly fine with their hunchbacks. It's other issues, such as fishing net entanglements, that bring them to the center for treatment.

That's why staff usually opt not to operate on a deformity. If a deformed elephant seal is sickly or unable to mate, it's best for the overall health of the species to let nature take its course, staff said.

"It very quickly gets into an ethical area we don't think we should go into," Van Bonn said. "So we take it on a case-by-case basis.

"In many cases, a humped back might look bad but doesn't hurt the animal at all," he added. "They're bent, is all."

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