

# Is this any way to save a species?

Thanks to the influence of a powerful US senator, more than \$120 million has been pumped into research on Alaska's endangered Steller sea lions in just four years. Rex Dalton asks what we've learned.

A hardy creature of Alaska's forbidding Aleutian Islands, the mighty Steller sea lion (*Eumetopias jubatus*) survives where few other mammals can. In freezing temperatures and battered by Arctic storms, bulls of the species can reach 1,000 kilograms.

But a scientific initiative to determine why the Aleutian population of Stellers has plunged over the past three decades is making them a wilderness legend for another reason. For some biologists, the Steller has become a symbol of how not to conduct complex ecosystems research. "The dollars were directed toward dealing with a political conflict," claims Larry Crowder, a population ecologist at Duke University in Durham, North Carolina.

Over the past four years, the US government has poured more than \$120 million into Steller research — a sum described by one biologist working on the species as "obscene". It dwarfs the funding for research on other endangered marine animals, several of which are much closer to extinction. Yet this highly politicized programme has so far failed to resolve a key question — whether fishing is responsible for the Steller's decline.

Steller sea lions, named after the German naturalist Georg Steller, who described them in 1741, were abundant in the northern Pacific until the 1960s. But by 1990, numbers off western Alaska had dropped so dramatically that the Steller was declared a 'threatened' species under the US Endangered Species Act. In western Alaskan waters, this listing did nothing

to halt the decline. So in 1997, federal officials upgraded the status of the population west of 144° W to 'endangered'. Today, the western population of Stellers stands at around 35,000 adults.

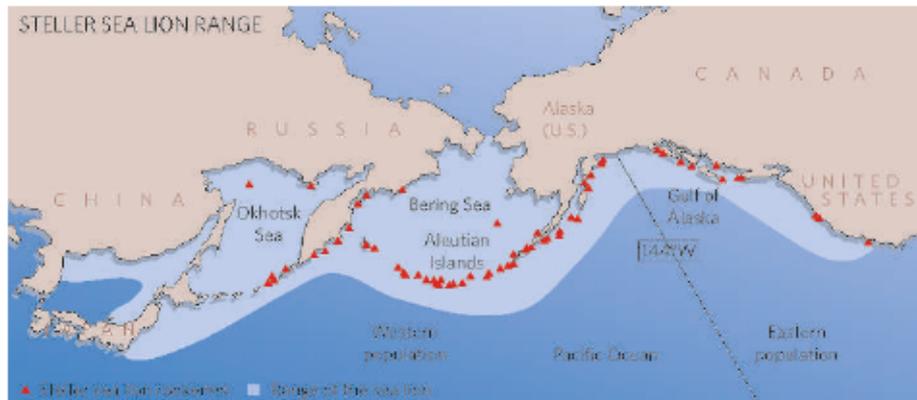
But the cause of the precipitous decline remains a mystery — particularly when the separate Steller population along Alaska's southeast coast continued to thrive. Some biologists blame disease, pollution, predation by killer whales, entanglement in fishing gear, or a combination of these. Others suggest that the cause is depletion of the western Stellers' prey, either as a result of local climate change affecting fish populations or because of commercial fishing.

Knowing why the population declined will help devise a plan to ensure its long-term survival, and the Steller Sea Lion Research

Initiative, launched in 2001, is supposed to provide some answers. But the idea of running such a huge research programme wasn't dreamed up by conservation biologists. Rather, it was the product of congressional intervention in a battle between environmental groups and fishing interests.

Environmentalists believe that the Stellers' decline is directly linked to commercial fishing — in particular trawling for walleye pollock (*Theragra chalcogramma*), a cod-like species whose roe is in high demand for sushi. In the late 1990s, environmentalists were getting a sympathetic hearing from the administration of President Bill Clinton, and were using the courts to try to get tighter controls on the fishing industry.

In 1998, a coalition of environmental groups filed a legal complaint alleging that the US





Million-dollar babies: endangered western Steller sea lions enjoy unprecedented research funding.

National Marine Fisheries Service (NMFS) had violated the Endangered Species Act by failing to adequately assess the impacts of fisheries on the Stellers. The ensuing court battle went through numerous twists and turns. But when the federal judge hearing the case blocked a trawling season in Alaskan waters in the summer of 2000, a powerful ally of the fishing industry stepped into the fray: Republican Senator Ted Stevens.

Alaska may not have many voters, but in Stevens it has one of the most senior and influential members of Congress. Then chairman of the Senate Appropriations Committee, Stevens could put his spin on almost any government funding.

With the fishing barons enraged over the court actions, Stevens used his influence to the full. In the waning December days of the 2000 congressional session, he held up the spending bill for the entire US government for a week, until he got what he wanted. Behind closed doors, a deal was hashed out in which pollock fishing would continue, except in areas close to Steller rookeries and haul-outs. Meanwhile, the National Research Council (NRC) was asked to conduct an independent review of the evidence on the Stellers' decline. And the Steller Sea Lion Research Initiative, costing more than \$40 million in the first year alone, was launched.

"It was not a good way to create a research programme," says Andrew Rosenberg, now an ecologist at the University of New Hampshire in Durham, but formerly a government fisheries scientist involved in research on Stellers. Until 2001, the federal budget for Steller research hovered around \$1 million a year. Suddenly, a huge amount of cash was thrown at Steller studies, with little prior planning. "I thought we would be lucky if 10% of the money was well spent," says one government scientist, who asked not to be named. The

funds, administered by the NMFS, also had to be spent quickly within particular budget years, which limited the scope for long-term ecological projects.

Now scientists are taking stock of what has been achieved. Last autumn, at a four-day conference on sea-lion conservation and research in Anchorage, Alaska, experts heard many of the first presentations of projects from the Steller initiative. In the opening session, Tom Loughlin of the NMFS's National Marine Mammal Laboratory in Seattle, who formerly helped administer the initiative, asked provocatively: "What does \$120 million buy?"

#### Value for money?

Views on that point were divided. Among researchers funded through the initiative, there was great enthusiasm for projects that had provided basic knowledge of a difficult animal to study in a dangerous environment. There were presentations on diet, metabolism and physiology; on possible pollutants and pathogens; on reproductive performance and juvenile health; and on how far Stellers roam from their rookeries and haul-outs — important information in determining the size of no-fish zones around these sites to ensure adequate food for the sea lions. "These are very complicated issues," says Douglas DeMaster, director of the Alaska Fisheries Science Center in Seattle, which oversees the Steller research initiative. "That makes for big expensive studies."

But some scientists argue that important opportunities to understand the Stellers' population biology have been missed. "The studies mainly just allow us to understand Stellers better," says Crowder. "A study just can't be about metabolic pathways of a certain fish food. You have to link the study to population dynamics."

"I am pretty sceptical about the research money being targeted efficiently on key

issues," concludes Crowder, who served on the NRC panel that eventually reported in 2003, with the Steller research initiative already well down the tracks.

That report<sup>1</sup>, which suggested that a combination of factors other than a diminished food supply was probably to blame for the Stellers' decline, was itself controversial. Some experts criticized the NRC panel for concentrating too much on the contested reasons for the Stellers' decline rather than advising on research and other measures that might be taken to ensure their survival. "It asked the wrong question", Rosenberg argues. "The council didn't jump into this the way it should have."

But the panel did come up with one firm recommendation for research: the best way to test the impact of commercial fishing, it said, would be to establish areas open and closed to fishing and monitor the survival of sea lions in each. In the event, getting the fishing industry to agree to this proved politically impossible. "We wanted to do it, but no one wanted an area closed for fishing," says DeMaster.

For environmentalists, this failure is indicative of the problem with the Steller research programme. They contend that the legislation was worded in such a way that money would be steered away from some of the most germane research — in particular, any projects that might implicate the fishing industry in the Stellers' decline. The legislation specified, for example, that the initiative should include projects looking at the roles of predators and climate change. "The money didn't come without strings," claims Janis Searles, an attorney in Portland, Oregon, who was formerly with Earthjustice, a non-profit public interest law firm based in Oakland, California. "From the US citizenry's perspective, having Congress direct the spending wasn't the smartest idea."

In the absence of any comparison between large areas open and closed for fishing, researchers have adopted other methods of investigating whether the Stellers are nutritionally stressed — and if so, why. The main bone of contention surrounds the role of pollock in the sea lions' diet, and an idea called the 'junk-food hypothesis'. This argues that Stellers prefer to eat oily fish such as herring and mackerel. But since the 1960s, the junk-food theory suggests, climate change has reduced the stocks of these fish in western Alaskan waters, causing them to be replaced by pollock, which is less nutritious<sup>2</sup>.

Advocates of the junk-food hypothesis point to evidence that includes infrared imaging of Stellers preferentially feeding on herring at night in the wild<sup>3</sup>, and argue that pollock fishing is not the main reason for the animals' decline. The idea has been promoted most strongly by Andrew Trites, a biologist at the University of British Columbia in Vancouver, Canada — whose relationship with the fishing industry has sparked controversy (see 'Conflict of interest claims muddy the waters', overleaf).

At the Anchorage meeting, some researchers

## Conflict of interest claims muddy the waters

In the lavishly funded world of Steller sea lion research, Andrew Trites is a stellar figure. At a major conference in Alaska last autumn, he co-authored 15 presentations on Steller sea lions — more than any other researcher. He is also research director of the North Pacific Universities Marine Mammal Research Consortium, which has received at least \$9 million from the Steller Sea Lion Research Initiative.

Yet some biologists are suspicious about the relationship between the fishing industry and Trites's consortium, which includes researchers at the University of British Columbia in Vancouver, Canada, where Trites is based, and scientists at three US universities: the University of Alaska, the University of Washington, and Oregon State University. It was set up in 1992, after fishing-industry leaders asked universities in the region to submit proposals for research on Steller sea lions.

In 1997, Trites wrote to US federal officials on behalf of the consortium, arguing that western Alaska's Stellers should not be classified as endangered. The move prompted Lloyd Lowry, then Alaska's top official managing marine mammal conservation, to resign from the consortium's scientific advisory board with



Researchers disagree over the impact of commercial fishing on the western Steller sea lions.

a stinging letter. Trites was "acting as [an] advocate for the commercial fishing industry instead of as [an] objective scientist," Lowry wrote. His letter accused Trites of misusing science in "a blatant attempt to absolve the groundfish trawl industry from any responsibility for the Steller problem".

With hindsight, Trites concedes that he should not have written on behalf of the consortium. He has also now changed his

mind about the Stellers' status, and agrees that the western population should be listed as endangered. And he rejects the accusation that he misused science to favour fishing interests. The consortium's research is focused on topics that its members believe are crucial to protecting Steller sea lions, he says. "We want to make sure we are asking the key questions to get the best value from the research."

claimed that the junk-food hypothesis doesn't stand up. Reviewing the available data on fish stocks and sea-lion diets, Lowell Fritz, a biologist at the Alaska Fisheries Science Center, argued that evidence for the shift proposed by Trites and his supporters is weak or non-existent. "It also is often overlooked that cousins of Stellers are doing just fine eating pollock all over the world," Fritz adds. His analysis will soon be published in *Marine Mammal Science*; Trites is planning to publish his own review supporting the theory.

While the debate rages on, one study presented at the Anchorage meeting did look squarely at the crucial relationship between fishing and Steller populations. Initiated before the congressional largesse and costing around \$200,000, it formed the doctoral thesis of Daniel Hennen, then a graduate student at Montana State University in Bozeman.

Hennen analysed population data for Stellers at 33 rookeries along the Aleutians from 1977 to 2001, relating the figures to regional fish-catch data for the same period. Before the animals were listed as threatened, he found that fishing seemed to be hurting the populations. After protection was in place, the populations studied started to bounce back.

"The decline in the Steller population was fastest in geographical areas where there was the most fishing," says Daniel Goodman, Hennen's supervisor at Montana State. Hennen, now a postdoc at the Alaska SeaLife Center in Seward, adds that the strict enforcement of a ban on sea-lion shooting after 1990 may also

have been significant, and that he plans to publish his results soon.

Crowder calls Hennen's work "the most strategic and carefully done research" on the relationship between fishing and the Steller population decline, noting an absence of similar studies in the published output of the Steller Sea Lion Research Initiative. "We are spending millions of dollars for grey literature that never has much influence," Crowder complains. "And this is happening at a time when

money for research on other endangered marine species — turtles, birds, otters and seals — isn't available."

More Steller research money is set to flow. President George W. Bush's budget for next year includes a proposal for about \$10 million, which could well be increased by Congress. A spokeswoman for Stevens says that the senator considers the programme valuable.

Meanwhile, federal officials, scientists and stakeholders, including fishing industry representatives, are still arguing over a new Steller recovery plan, to replace a version that dates from 1992.

And the political battles are destined to continue. In 2003, Stevens won another Congressional measure, designed to promote fishing in Alaskan waters. As a result, the state is now entertaining proposals to allow fishing in certain areas within 5.5 kilometres of the shore. "Some of these proposed fishing areas are near critical federally protected Steller habitat," says Michael LeVine, an attorney for Earthjustice based in Juneau, Alaska.

What does \$120 million buy? Not, it seems, an end to the controversy surrounding this majestic marine mammal. ■

Rex Dalton is *Nature's* US West Coast correspondent.

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REASONS

Senator Ted Stevens: the political dimension.

1. *The Decline of the Steller Sea Lion in Alaskan Waters: Untangling Food Webs and Fishing Nets* (Nat'l Acad. Press, Washington DC, 2003).
2. Rosen, D.A.S. & Trites, A. W. *Can. J. Zool.* 78, 234–239 (2000).
3. Thomas, G.L. & Thorne, R.E. *Nature* 411, 1013 (2001).