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THE EFFECT OF THE *EXXON VALDEZ* OIL SPILL ON SHORT-TAILED SHEARWATERS

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Each year millions of short-tailed shearwaters, *Puffinus tenuirostris* arrive along the Alaskan coastline during their annual 15,000 km migratory journey from Australia.

They join 85 other species of seabirds, which makes this region one of the richest seabird assemblies in the world. As is now ecological history the birds and other wildlife were greeted by the huge oil spill of 24 March 1989 from the oil tanker *Exxon Valdez* in Prince William Sound, Gulf of Alaska. The tanker was headed for Long Beach, California, carrying a full load of 126 million barrels. The total spillage was 11.2 million gallons which compares with the *Torrey Canyon* spill of nearly 42 million gallons off England in 1967 and the *Amoco Cadiz* spill of 68 million gallons off France in 1978.

The effects on the wildlife are now known to have been devastating and it is timely to speculate on how the short-tailed shearwater could be affected.

THE OIL SPILL

The *Exxon Valdez* ran aground under the clear skies, in calm seas and in a deep water sound (900-1600 feet)—all conditions considered safe for maritime travel. The morning after the spill the oil covered an area of 32 square miles. By Monday morning 27 March strong winds had shaped the oil into a rectangular slick about half a mile by 40 miles and the North Pacific Current was moving it in a southwesterly direction. Three weeks later the oil spill covered approximately 3,000 square miles; near the end of April the oil was heading towards Kodiak Island, 400 km from the site of the original spill.

The local coastline features of beaches, rocky islands and fiords are the worst

affected by the oil, which has been pushed in by choppy seas and strong winds. Coastal wildlife is most at risk, including resident fauna and those species which feed within the coastal zone.

Oil is not only a toxic substance if ingested, but can kill animals by interfering with functions such as thermoregulation, buoyancy and flight. For birds such as the short-tailed shearwater the threats posed by the oil are that it prevents the feathers forming an effective waterproof seal, causing the birds to lose buoyancy, and inducing hypothermia by keeping them wet and cold. It also cripples flight as well as causing poisoning, stomach inflammation, diarrhoea, intestinal blockage and starvation.

The migratory habits, feeding strategies and distribution of the short-tailed shearwater in the waters of the Gulf of Alaska are factors to be considered in assessing the risks of this species.

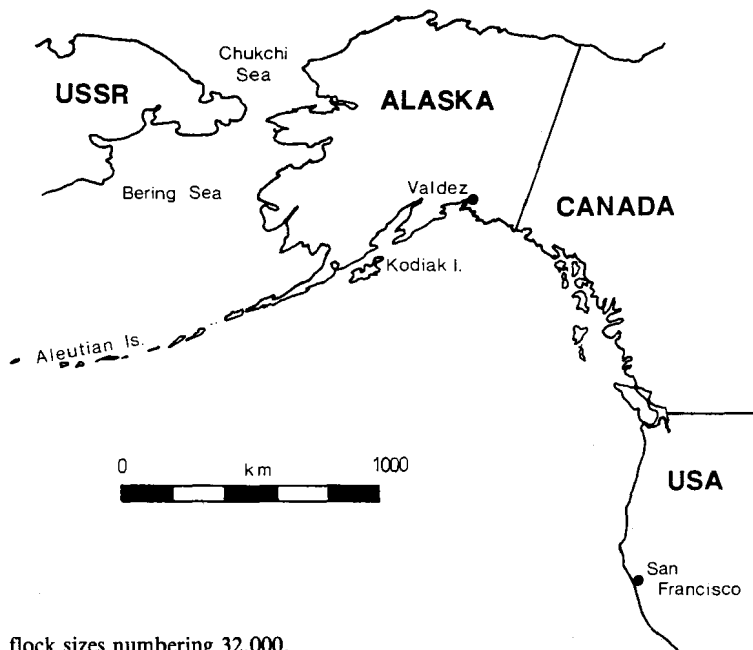
SHEARWATER MIGRATION

The short-tailed shearwater, commonly known as the Tasmanian muttonbird, is a circum-Pacific migrant spending the boreal summer in the Northern Pacific region. It breeds only in Southern Australia and is most abundant in Tasmania. The first to leave the breeding areas are sexually immature birds near the end of March, followed by the parents around mid-April then the fledged chicks at end of April to early May. The shearwaters migrate rapidly and arrive in the Northern Hemisphere on a broad front across the central Pacific Ocean. Occasionally many are washed up dead on Japanese beaches as easterly winds blow weak birds, particularly juveniles, off their normal route westward.

The majority reach the northern part of the Pacific Ocean between the end of April and the beginning of June. The largest assemblies can be observed in the Northern Hemisphere spring and the beginning of summer in the eastern part of the Bering Sea. In the second half of summer many pass into the Chukchi Sea and, while birds are still flocking into the Chukchi Sea, southwards migration begins.

The species' status on the North American west coast and the Gulf of Alaska is confusing because of the difficulty of distinguishing it from the similar sooty shearwater *P. griseus* which is common off California. However, very large flocks may occasionally occur off the west Canadian coast in May under certain wind conditions. This is because some birds migrate up the North American coast and some across the Pacific between the Hawaiian Islands and North America.

In the Gulf of Alaska short-tailed and sooty shearwaters are the dominant birds in spring and prefer the waters of the continental shelf, which is between 100 and 150 km wide. Numbers are greatest in May and by June their estimated density drops to half of that in May. In the north east of the Gulf, the Kodiak area, short-tailed shearwaters outnumber sooty shearwaters by about 1.2:1 with



flock sizes numbering 32,000.

Of an estimated world population of 23 million, the proportion of short-tailed shearwaters that frequent the Gulf area is not known. Indications are that the higher numbers flock to the Bering and Chukchi Seas. When the summer migration back to Australia commences at the beginning of September, short-tailed shearwaters fly mainly across the western half of the Pacific. Some flocks move through the Gulf of Alaska to California before heading southwards to Australia but the lack of sightings indicates that there is no regular migratory movement along the Canadian coast from August onwards.

FEEDING

Monitoring of the wildlife at Valdez show that diving seabirds which feed close to the coast have been the most badly affected species. Short-tailed shearwaters use several feeding methods, but mainly plunge-dive after food such as squid, krill and fish. They may feed close inshore so it is likely that some short-tailed shearwaters have been affected by the spill. Short-tailed shearwaters have also been observed to feed over an extensive area in the Gulf of Alaska, and this flexibility may be advantageous to the species in the current crisis.

The overall impact of the oil spill on wildlife has been particularly severe on coastal wildlife such as sea otters, eagles, ducks and cormorants. Although clean-up operations have been in progress all year, experience from previous oil spills around the world demonstrates that recovery of the volume of oil spilt is rarely over 10%.

American wildlife biologists will continue to monitor the situation and in Tasmania the Department of Parks, Wildlife and Heritage have been keeping a close watch on the 1989-90 breeding season, and will take management initiatives available to conserve the species.

AN UNUSUAL OBSERVATION OF A BLUE-TONGUED LIZARD

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On Thursday the 23rd of November 1989 at approximately 11.00 a.m., while working in a wetland on the east coast, I noticed an interesting and apparently original observation. The wetland, called the Big Punchbowl, is located on the eastern edge of Moulting Lagoon northeast of Swansea. It is a nearly circular shallow basin about 500m in diameter and was then holding water about one metre deep. The water surface was nearly covered around the edges by a dense stand of *Baumea rubiginosa* and *Lepidosperma longitudinale*. The *Baumea* thinned out towards the centre but the entire surface was broken by scattered individuals, often dead and fallen over, interspersed with *Triglochin procerum*.

While standing in water 800mm deep about 40m out from shore, recording information from one of the vegetation plots I had marked out earlier in the year, I was standing quietly and kept hearing a "plopping", splashing sound repeated at intervals. My first thought was that it was made by one of the swamp hens (*Porphyrio porphyrio*) that are common there and were frequently calling that day. I kept turning around but couldn't see anything.

Finally the sound occurred quite close to me and I stopped what I was doing, determined to find out what it was. The culprit soon revealed itself and to my surprise it was a blue-tongue lizard (*Tiliqua nigrolutea*). It was coming from the centre of the lagoon, heading toward shore and I was able to observe it closely as it passed within 2m of me. Although it paused every few metres to rest where the vegetation was dense enough to support it, it did actively swim across stretches of open water. This was accomplished by thrashing its tail and paddling with its legs. It floated low in the water and had to tilt its head back to keep its nostrils above the surface. It was apparently finding the going a bit hard because when it stopped to rest it was breathing heavily. While swimming though, it looked confident and certainly appeared to be out there by choice rather than by accident.