A. SCHEININ/IMMAC/UNIV. HAIFA

An unusual pilgrimage: a grey whale spotted off the coast of Israel.

MARINE BIOLOGY

Wayward whale not a fluke

Warming Arctic cited as likely cause of freak migration.

BY NADIA DRAKE

The sighting of a lone grey whale (*Eschrichtius robustus*) last year off the beaches of Israel, and then again near Spain, came as a surprise to many. How did a creature normally found in Pacific waters come to be in the Mediterranean Sea? Although no one knows what happened to the bus-sized mammal after its last appearance in May 2010, a group of researchers now suggests that the sighting might indicate a wider trend: the mixing of northern Atlantic and Pacific marine ecosystems, made possible by the climate-driven depletion of Arctic sea ice.

Marine biologist Aviad Scheinin, from the Israel Marine Mammal Research and Assistance Center in Haifa, and his colleagues considered the errant whale's most likely origin and route. In a paper published online on 19 April in *Marine Biodiversity Records* (A. P. Scheinin *et al. Mar. Biodiv. Rec.* **4,** e28; 2011), they rule out a source in the presumed-extinct North Atlantic population. Comparing photos of the whale's fluke with those of individuals in the small, critically endangered western (North) Pacific population, they found no matches, implying that the whale is a member of the roughly 20,000-strong eastern North Pacific population.

After feeding in the Chukchi and Bering seas during the summer months, grey whales normally head south through the Pacific. This one could have followed an Arctic route instead, perhaps along the Siberian coast where sea ice has been in marked retreat.

"The whale was supposed to go to California or Mexico," Scheinin says. "But it got lost and ended up in the North Atlantic. Then it started to go south, keeping the land on its left as it would if it were travelling down the North American coastline, and made a left at Gibraltar."

In autumn 2009, when the whale presumably would have started its odyssey, sea-ice coverage in the Arctic was sparse enough to make such a passage plausible, says Harry Stern, a mathematician at the University of Washington in Seattle, who studies sea ice. "The opening of the passages that we've seen in the last four or five years is unprecedented," he adds.

John Calambokidis, a research biologist with the Cascadia Research Collective, a nonprofit scientific and educational organization in Olympia, Washington, says the authors have done a good job in considering factors such as grey whale populations, feeding habits and swimming speeds. "A grey whale in the Mediterranean does not make sense," he says. "But among the explanations for the bizarre occurrence, this is definitely the most plausible."

The lack of a tissue sample means that the whale can't be traced to its original population using genetic markers. With no further data, it is premature to conclude that the sighting is related to climate change, says ecologist Kristin Laidre of the University of Washington in Seattle. But climate is sure to affect future whale sightings, she says. "There's no doubt that ice loss will allow the Arctic to act as a corridor for marine species exchange between areas that were previously geographically isolated," she says. "Whales will migrate to the Arctic earlier, move farther north and stay longer. Those are things we predict, and expect to see."

Grey whales aren't the only creatures whose ranges might expand as summer sea ice contracts. "You could make an argument for any species with an open-ocean phase in its life history," says evolutionary biologist David Tallmon, from the University of Alaska Southeast, in Juneau. Potential travellers range from the smallest diatoms to the largest whales — and include terrestrial species seeking colder temperatures nearer the poles (see *Nature* **468,** 891; 2010). "Whole thermal regimes changing could lead to all sorts of weird ecological effects," Tallmon says. ■

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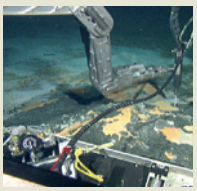

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