

## Shrinking in the Heat

By Jennifer Parrilli

What was once a hotly-debated topic (no pun intended) has now become a widely-accepted fact: climate change is here and it's altering the way species on our planet behave. While scientists around the world are still in the process of measuring how far-reaching climate change effects are, for the most part, the global response to a warmer Earth can be categorized as "shrinkage." Everything seems to be getting smaller; ice caps are getting smaller, species ranges are getting smaller, the variety of species is diminishing, and once-vast expanses of coral reef are now just a tiny portion of what they were before. New research is emerging that indicates that even some animals are getting smaller too.

One such creature is the migratory shorebird *Calidris canutus canutus*, known to its friends as the Red Knot. The Red Knot is a medium-sized bird, with a sandy speckled back and a roasty red throat and belly. It can be seen skipping along the water's edge, occasionally dipping its black beak into the sand to feed. However, this species may soon become harder to see. It seems that climate change is causing both shrinking beaks and shrinking body sizes in Red Knots, especially for populations that migrate along northwest coastlines from Russia to Africa. Jan A. van Gils and colleagues at Utrecht University in the Netherlands are studying how earlier snow melts in the Arctic are changing the Red Knots' diet, resulting in shrinkage.

How can climate change shrink a bird? It has to do with the Red Knots' migratory behavior. These birds breed in the Arctic at Taimyr Peninsula, after the first snow melt of the season. Birds that were caught and banded in Gdansk Bay, Poland – where the birds stop off for a brief break before heading south – have reduced in size over the past three decades. Van Gils *et al.* have discovered that the size of these birds is related to snow melting earlier each year. These smaller birds run into trouble when they get to the western tip of Africa, where they stay to feed before the next annual breeding cycle.

The diet of a Red Knot consists of two bivalves and a seagrass. Birds with longer beaks can reach deeper into the sand to access their preferred diet of *Loripes lucinalis* mollusks. Juvenile birds and the smaller adults can't quite get at the Loripes and so end up dining on another bivalve – *Dosinia isocardia* – and a seagrass called *Zostera noltii*, which are much less nutritious. This lower-quality diet results in higher mortality rates for the Red Knots.

The mismatch between food sources and food seekers has become an all-too-common theme with the advancement of climate change. It affects not only speckled shorebirds, but many migratory species around the globe. More studies like the van Gils Red Knot work will help inform conservation efforts and may predict whether the world will be shrinking for other species in the future.

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