



SUPPORTING SHOREBIRD CONSERVATION

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Wader Quest Objectives:

To raise public awareness about, and to promote an understanding and appreciation of, waders or shorebirds (birds of the sub order Charadrii and to include the family Turnicidae, as defined by the Handbook of Birds of the World Volume 3 del Hoyo, Elliott and Sargatal eds 1996).

To raise funds, which, at the discretion of the Board of Trustees, is to be used to make small grants or carry out appeals for wader conservation projects worldwide.

To promote for the benefit of the public the conservation and protection of waders or shorebirds and improvements of their physical and natural habitats.

To advance the education of the public regarding the conservation and protection of waders or shorebirds and their natural habitats.

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Wader Quest Articles

How are waders being affected by warming tundra?

- By Rick and Elis Simpson

You could be forgiven for thinking that a warmer tundra may result in an increase in the abundance of insects. That being so, you could further surmise that this would provide a good source of food for young waders, thus making them stronger and enabling them to develop more quickly. But does this tipping of the climate and the weather cycles that follow, really mean things are better for Arctic breeding waders?



Baird's Sandpiper *Calidris bairdii*; a typical Arctic breeding wader © Elis Simpson

It seems not. Whilst warmer temperatures, over a longer period, do increase the length of the season for flying insects, it does not necessarily mean the same is true for the all-important flightless insects that wader chicks depend upon to grow.

When it comes to raising young birds in the Arctic, timing is crucial. Several insect species emerge one after the other over a three- or four-week period providing a super abundance of insects in a pulse. It is within this window of opportunity that waders have evolved to hatch their young, giving them the best possible start in life. The majority of wader species, and all those that breed in the tundra, have precocial young. This means that as soon as they hatch and have dried, they are pretty much independent, being able to run and find food for themselves. At this stage, the parents are only there to guide the young birds to the best feeding areas and to keep them safe from predators as well as providing warmth against the cold when



Broad-billed Sandpiper chicks *Calidris falcinellus*; cryptic colouring helps them to hide from predators
© Stein Ø. Nilsen & Tone MalmStein

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needed. If this window of opportunity shifts and the timing of the egg laying does not, then this will lead to the chicks missing this vitally important start in life.

The emergence of insects is triggered by thawing. The hatching of the birds has been synchronised with plant growth and the emergence of insects but with temperature changes the development of plants and insects may not follow the same timetable as the birds' needs.

This may disadvantage waders, but it may well benefit geese as they find the new conditions are more to their liking than before. This potentially means an increase in goose populations on wader breeding grounds. In the USA, the Snow Goose *Chen caerulescens* population has increased hugely. This increase in the number of geese will further add to the negative impact on the breeding success of waders. Greater numbers of geese will damage the vegetation, increase disturbance of brooding birds as they have to defend their nest site, leaving it unattended, there is the potential for egg trampling by the geese and there may well be an increased number of predators attracted by the presence of the geese.

In especially warm springs the physical size of the chicks that survive to migrate south are, on average, smaller. This is thought to be because the birds are under-nourished as they have missed the super abundance of insects.

Does it matter that birds are slightly smaller?

Sadly, yes, it does. Among the Red Knots *Calidris canutus* studied in Russia the smaller birds have, by default, shorter bills. Whilst this does not necessarily impact on their survival in the Arctic it may well have a negative impact further south on the wintering grounds.

There are two main types of food that the Red Knots eat on the tropical intertidal mud. One is abundant and nutritious and lives at 35mm or deeper in the substrate, the other is less abundant and less nutritious and lives at a shallower depth. The normal average bill size for a Red Knot is around 40mm so they can easily reach and take advantage of the nutritious and abundant prey. The smaller birds may have a bill as short as 30mm and this will mean they cannot reach this rich resource, having to rely instead on the less abundant and less nutritious prey nearer the surface.



Juvenile Red Knot © Elis Simpson



Snow Geese © Elis Simpson

The result of this is that the smaller birds are less well-nourished on their wintering grounds than those with longer bills. For long distance migrants being well-fed is essential to their very survival, it is not surprising, then, that smaller birds have a shorter life expectancy than normal sized birds. In addition, and more importantly in the long term, undernourished birds may not be in condition to return north to breed. If this happens occasionally it is not a major problem, but if entire populations are affected over successive seasons, the number of breeding adults that will return to breed will fall and that is the route to population declines and in the end extinction..

Reference: Van Gils, J.A. et al. 2016. 'Body shrinkage due to Arctic warming reduces red knot fitness in tropical wintering range.' Science 352: 819–821