



SUPPORTING SHOREBIRD CONSERVATION

Registered Charity (England and Wales)
1183748

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.

To join as a Friend or Sponsor write to:

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Wader Quest Articles

Benthos; aka wader food - By Rick and Elis Simpson

So, what exactly are all those waders eating out there on the mudflats with such enthusiasm? The answer is benthos, aka wader food.

Benthos is the flora and fauna found on the bottom, or in the bottom sediments, of a sea or lake.



There are two types of benthos:

Zoobenthos

Phytobenthos

Zoobenthos: comprises the animals belonging to this group.

Phytobenthos: comprises the plants belonging to this group.

They can be subdivided by size:

Macrobenthos

Meiobenthos

Microbenthos

Macrobenthos: Visible organisms of a length greater than 1mm. Includes [polychaete](#) worms (worms with bristles like lugworms etc.), [bivalves](#) (seashells with two halves like cockles, oysters, clams and mussels), [echinoderms](#) (star fish, sea urchins etc.), [sea anenomes](#), [corals](#), [sponges](#), [sea squirts](#), [turbellarians](#) (flatworms), [crabs](#), [lobsters](#) and [cumaceans](#) (comma shrimps).

Meiobenthos: Organisms that are between 1mm and 0.1mm in size. Includes [nematodes](#) (roundworms), [foraminiferas](#), [water bears](#), [gastrotriches](#) (hairybacks), [copepods](#) and [ostracods](#) (seed shrimps).

Microbenthos: Organisms under 0.1mm in size. Includes [bacteria](#), [diatoms](#) (algae), [ciliates](#), [amoeba](#) and [flagellates](#).

They can also be divided by their location:

Endobenthos

Epibenthos

Hyperbenthos

Endobenthos: living buried, or burrowing in the sediment

Epibenthos: living on top of the sediments

Hyperbenthos: living just above the sediment



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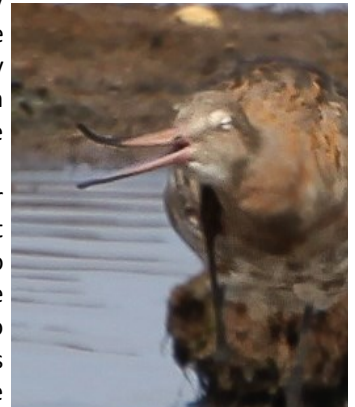
Wader bills have developed to take advantage of all forms of benthos as prey.



Black-tailed Godwit *Limosa limosa* foraging for endobenthic prey - Elis Simpson

Long bills that penetrate the mud such as those of godwits will search for endobenthic organisms.

Species feeding in this way will be doing so without the benefit of sight so their bills are sensitive to touch and pressure with nerve endings known as [Herbst corpuscles](#), which can detect the difference in pressure produced by a solid object in the wet mud. Many waders that feed in this way demonstrate [rhynchokinesis](#), where the upper mandible can be bent to allow the bird to strike and capture prey. This ability to forage blind means they are equally able to forage at night as they are during the day.



Black-tailed Godwit demonstrating rhynchokinesis in action - Elis Simpson

Short bills such as those of the plovers will be taking mostly epibenthos and some endobenthos organisms that live near or just under the surface as they forage primarily by sight. This would obviously suggest that feeding at night would be a disadvantage. It is for this reason that plovers have such proportionally large eyes to maximise light gathering to facilitate night foraging.

There is also a school of thought that suggests they may also be able to forage aurally which would also not be affected by the light level.



Northern Lapwing *Vanellus vanellus* picking epibenthic prey from the surface of the mud - Elis Simpson



Juvenile Red Knots *Calidris canutus* foraging on the shoreline use both tactile and visual foraging methods - Elis Simpson

Some waders with **medium-length bills**, such as Red Knot may employ both methods of feeding - mainly tactile on the wintering grounds where it forages for endobenthos and mainly visual on the breeding grounds where it forages for non-benthic creatures away from the benthic zone. These species have sensitive bills for tactile feeding and forward-facing vision for visual feeding.

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The more delicate recurved **sweeping bills** of avocets will be seeking epibenthic prey on the surface of the mud and hyperbenthic organisms that are suspended in the water.



Pied Avocet sweeping for the epibenthos and hyperbenthos - Elis Simpson

Remember, mud is not just mud, it holds a community of organisms, collectively known as benthos, which waders depend upon to survive.



Love your mud - they do!