

# Hermit crab real estate

If you think your house is rubbish, spare a thought for the hermit crab, writes David Barnes.

The world's shorelines have become much more colourful in the last few decades, unfortunately because plastic pieces and other artefacts wash up in large numbers, even on the remotest Antarctic islands. Our rubbish is choking and poisoning animals at sea and changing coastal wilderness into wasteland. But even stranded flotsam has its uses – one of the most ubiquitous seashore animals has a brand new bag.



Hermit crabs are common and abundant inhabitants of the world's coastline. They can make the whole surface of tropical beaches seem alive at night. For hundreds of years people have been fascinated by their bizarre behaviours, such as clustering together in their thousands, climbing trees and crossing sand dunes, but mainly because of their house borrowing. Hermit crabs carry their homes – usually old snail shells – on their backs and get new ones by swapping with each other or picking up empties. Human housing problems are minor in comparison.

Homelessness is not an option for these animals, as their abdomens are soft. A home stops water loss in the tropical sun, protects a delicate rear and stops them being eaten. Their growth, both as individuals and populations, depends on constantly finding new houses. But there are often not many empty shells or crabs willing to swap and hermit crabs aren't good at digging up buried shells or persuading living snails to part with theirs. I have been looking at the complex and dynamic relationships between hermit crabs, humans and the coastal environment.

In the tropics humans use hermit crabs as fishing bait (some weigh up to 75g), pets and living waste disposal systems (discarded food and even faeces are unmissable feasts). Other animals eat them. Sea urchins even temporarily hijack them for their shells.

Hermit crabs use humans to provide the one thing in shortest supply – new housing. For thousands of years people on tropical coasts have harvested sea snails from the shore, eaten the living snail and left behind piles of shells – the hermit crab could then pick a new shell. Prehistoric middens reveal shells often too big for all but the giants of the hermit crab world. But as more and more people collect the free food, they take younger snails and the discarded shells are getting smaller. In some places the piles of shells have dwindled or even run out. On some tropical coasts people have eaten the snail populations so marine snails, and so hermit crabs, are rare. The really giant hermit crabs, the coconut crab (which only uses shells when small), has suffered a similar fate. It's big, tasty and easy to catch and is now restricted to a few small islands.

In the last two decades people have seen hermit crabs picking up plastic bottle tops and other stranded rubbish, even on remote island shores such as Christmas Island and Henderson Atoll. The rubbish may not seal in water well to keep the crabs moist, but it is strong, light and has a 'many-hermit crab-lifetime' guarantee.

Behavioural trends in hermit crabs mirror patterns in global rubbish distribution. As our love affair with packaging and plastic continues unabated,

our clean up campaigns of coastlines will be ever more busy. But will hermit crabs settle for quantity rather than quality?

The way hermit crabs acquire their homes has taught us much about the complexity of animal decision-making, rules, communication and division of resources. Their houses are a direct indication of how humans influence the coastline. Their need for a series of homes is a remarkable evolutionary story and hermit crabs are successful in the sea, on the shore and even to a limited degree on land. If the predicted intensity of sea warming does happen, there could be hermit crabs in Antarctica by the next century. And unless we change our ways, rubbish rather than shells may dominate hermit crab real estate even in this last frontier.

*David Barnes is a biologist at the British Antarctic Survey, Natural Environment Research Council, High Cross, Madingley Road, Cambridge CB3 0ET, tel: 01223 221613, email: d.barnes@bas.ac.uk*