CAPE GANNETS push the boundaries

Southern Africa's marine environment has undergone considerable change over the past few decades, both through increased fishing activity and climate change-related impacts. Arguably, one of the most significant changes has been at the intermediate trophic level, where overexploitation and environmental changes have impacted plankton-feeding fish such as sardine and anchovy. Unsustainable fisheries resulted in the collapse of sardine stocks off the Namibian coast in the late 1960s. Although better regulation was implemented off South Africa, the lack of spatial management of the fishery has contributed to a shift in fish distribution from the west coast to the Agulhas Bank off the south coast. These fish species are critical links in pelagic food-webs, governing the numbers and distribution of seabirds and other predators.

One such species is the Cape Gannet *Morus capensis*, which breeds at only six colonies off Namibia and South Africa. Its numbers decreased sharply at the three Namibian colonies during the 1970s. More recently, its numbers have decreased at the two colonies off South Africa's West Coast, following the local reduction in pelagic fish abundance. In Algoa Bay, at the eastern end of the gannet's range, its population trend is quite different. The eastward shift in sardine and anchovy biomass has allowed impressive population growth and, with some 90 000 breeding pairs, Bird Island now supports the world's largest gannetry.

Fitztitute Centre of Excellence team member Pierre Pistorius, based at the Nelson Mandela Metropolitan University in Port Elizabeth, is studying the Bird Island gannets. His students, Gavin Rishworth and David Green, recently obtained their Masters degrees for part of this work. Gavin took advantage of the latest developments in VHF technology to set up an automated monitoring system. Breeding pairs of gannets were fitted with VHF transmitters attached to PVC leg-bands to record when they are present at the colony. The amount of time the parent birds spend foraging provides a good indicator of prey availability. Gavin found that males provision the chicks more regularly than females do, while the females make longer foraging trips, presumably to recover from the rigours of egg production. Foraging effort increases as the chicks develop, to meet their growing energy demand.

PIERRE PISTORIUS

Gavin Rishworth (left) and David Green deploying instrumentation on a Cape Gannet at Bird Island.

Most importantly though, Gavin demonstrated how the approach could be used to monitor long-term changes in gannet foraging effort. This will allow us to detect changes in the availability of pelagic fish within the foraging range of gannets, about 200 kilometres from the island. We plan to extend this technology to Malgas Island on the West Coast to better understand the reasons for the different population trajectories at the two colonies.

David analysed one of the most extensive sets of diet samples of any seabird population, spanning 34 years of annual sampling of gannets breeding at Bird Island. He found a strong inverse relationship between the proportions of anchovy and sardine in gannet diets, resulting from the gannets' distinct preference for sardine. The results suggest that the abundance of the two fish species varies greatly year on year, with the pattern being highly dynamic over time. David also used GPS recorders to monitor the gannets' foraging distribution during the past three years. Anchovy dominated their diets over this period and, as sardine stocks moved back to the west, the gannets' foraging range increased as birds tracked this shifting food resource. Thus while the well-being of Cape Gannets – and several other Benguela seabirds – is intimately linked to the abundance and distribution of these mid-trophic-level fish, the gannets also provide a valuable tool to assess the health of these fish stocks.

For more information, contact
The Director, Percy FitzPatrick Institute of African Ornithology, University of Cape Town, Rondebosch, South Africa 7701.
E-mail *fitz@uct.ac.za*,
tel. +27 (0)21 650 3291 or
visit *www.fitzpatrick.uct.ac.za*