

Remotely Operated Vehicle exploring ichthyofauna association with habitat from shore-shelf, in an endemism hotspot in South Africa

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Abstract

The priority of understanding marine systems increases as expanding pressures are exerted on them. In South Africa, efforts are underway to utilise the ocean to stimulate economic growth which will result in further pressures on marine systems. The aim is to mitigate pressures, largely through proposed offshore marine protected areas (MPAs). One of these proposed MPAs is situated off the Kei river mouth in the Eastern Cape of South Africa.

The area offshore of the Kei river mouth is an endemism hotspot, and a transitional zone between the Subtropical East Coast and the Warm Temperate South Coast. The region was largely unexplored because of its treacherous sea conditions and because it was no longer an area of commercial fishing importance. A remotely operated vehicle (ROV) explored the regions' fish and benthic habitats and investigated their associations.

This study's results provide quantitative information on fish and habitat diversity in the intermediate depths off the Kei river mouth. Observations of rare, commercially important, yet critically endangered charismatic reef fish species were made. These included red steenbras (*Petrus Rupestris*), seventy-four (*Polysteganus undulosus*), red stumpnose (*Chrysoblephus gibbiceps*) and dageraad (*Chrysoblephus cristiceps*). Habitat types, including rhodolith beds, sponges, and deep-water corals were documented.

Maximum predicted fish diversity corresponded with mid-continental shelf, which is incorporated into the regions proposed MPA. The highest fish diversity was 10km within the shelf edge (which had a depth of approximately 100m) and was associated with the most structurally complex habitat biota: Fan Coral. Depth was a fundamental predictor associated with the presence and abundance of species distributions. The results support the location of the proposed MPA and are a step forward in identifying critical habitat to protect diversity and endangered species, and thus contribute to the regions spatial management and governance.