An ecological approach to spatial management

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It has been suggested that the only basis for the implementation of spatial management in the sardine and anchovy fishery is if there are two or more discrete stocks (Coetzee et al 2008, D. Butterworth pers. comm.); we demur. Spatial management can be implemented regardless of how many stocks there are. An ecosystem approach to fisheries management is an officially espoused principle of the Department of Agriculture, Forestry and Fisheries. Ecosystem considerations should compliment the current, stock-based approach. The management of low trophic level fisheries in particular must recognise and account explicitly for the risks that if local depletion occurs, negative consequences for other species such as seabirds may be severe. This is especially important in years of low fish abundance in certain areas.

The lack of ecological considerations for spatial management in this fishery implies that localised depletion is likely to be so rare and/or fleeting that it can be discounted. Under this paradigm, if local depletion occurs, fish numbers will be replenished quickly through natural movements of schools, and the fishery would not remove significant proportions of this biomass at spatio-temporal scales that would have consequences for dependent species or stock structure (e.g. Butterworth and de Moor 2010). However, there are explicit risks in continuing with this model, as it is currently based on untested assumptions about the movements of fish (rates, homogeneity, etc).

Logically, if all fishing mortality occurs in one area, one “may expect the spatial and temporal structure of a spawning component to be compromised” (Claytor and Clay 2001). Much of the purse-seine fishing along the South African coast occurred historically on the west coast (Pichegru et al. 2009). As a result of the shift in sardine to the south coast, even at a very coarse scale there were detectable periods of higher-than-average exploitation on the west coast (Coetzee et al 2008), which could have resulted in local depletion. The impacts of this concentration of catches are expected to be exacerbated in poor recruitment years. During their breeding season, African penguins forage in 4% of the area used by the fishery but 14% of the total catch is taken there (Pichegru et al. 2009). As a further example of potential localised depletion, half of that 14% was taken around Dyer Island, which covers only 0.8% of the fishery area (Pichegru et al. *op cit.*).

We propose that work be initiated to augment the current OMP regime with ecosystem-based considerations, through implementing spatio-temporal management of harvest strategies within the small pelagic fishery. The explicit aim of this proposal should be to ensure that associated and dependent species will not be subjected to periods of heightened competition with fishing for periods that could compromise key life-history parameters.

References

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