

Chapter 3

Objectives for an ecosystem monitoring programme in the BCLME based on land-breeding top predators

BCLME Top Predators Project Steering Committee

The project requires the objectives for an ecosystem monitoring programme based on land-breeding top predators in the BCLME to be addressed. The major land-breeding top predators in the BCLME are Cape Fur Seals *Arctocephalus pusillus* and a suite of seabirds.

Objectives for ecosystem monitoring programmes in the BCLME are likely to be influenced by the objectives of states falling within the BCLME region (Angola, Namibia, South Africa) regarding the management of their marine resources. Objectives for South Africa are listed in section 2 of its Marine Living Resources Act (No. 18 of 1998). These include:

- “(a) The need to achieve ... ecologically sustainable development of marine living resources;
- (b) the need to conserve marine living resources ...;
- (c) the need to apply precautionary approaches in respect of the management ... of marine living resources;
- (d) the need to ... achieve ... a sound ecological balance ...;
- (e) the need to protect the ecosystem as a whole, including species which are not targeted for exploitation;
- (f) the need to preserve biodiversity ...” (Government Gazette Vol. 395, No. 18930).

Objectives are also likely to be influenced by international declarations or agreements. For example, in 2002 at Johannesburg, the World Summit on Sustainable Development adopted a Plan of Implementation that agreed (Article 29d) to “encourage the application by 2010 of the ecosystem approach, noting the Reykjavik Declaration on Responsible Fisheries in the Marine Ecosystem” (FAO 2003). The 2001 Reykjavik Declaration had called for the incorporation into fisheries management of ecosystem considerations “such as predator–prey relationships” (<http://www.fao.org/PDF/acroe.htm>).

Earlier, at its Twenty-eighth Session on 31 October 1995, the FAO Conference adopted the FAO Code of Conduct for Responsible Fisheries. Article 6.2 of this Code states “Management measures should not only ensure the conservation of target species but also of species belonging to the same ecosystem or associated with or dependent upon the target species.” Article 6.5 reads “States and subregional and regional fisheries management organizations should apply a precautionary approach widely to conservation, management and exploitation of living aquatic resources in order to protect them and preserve the aquatic environment, taking

account of the best scientific evidence available. The absence of adequate scientific information should not be used as a reason for postponing or failing to take measures to conserve target species, associated or dependent species and non-target species and their environment” (<http://www.fao.org/DOCREP/005/v9878e/v9878e00.htm>).

The 1982 United Nations Convention of the Law of the Sea requires that “coastal states shall take into consideration the effects on species associated with or dependent upon harvested resources with a view to maintaining or restoring populations of such associated or dependent species above levels at which their reproduction may become seriously threatened” (FAO 2003).

The CCAMLR (Commission for the Conservation of Antarctic Marine Living Resources) Ecosystem Monitoring Programme (CEMP) has as objectives:

- “(ii) the maintenance of ecological relationships between harvested, dependent and related populations of Antarctic marine living resources and the restoration of depleted populations ...”
- (iii) the prevention of changes or minimization of the risk of changes in the marine ecosystem which are not reversible over two or three decades ...”

In essence CEMP attempts to monitor food availability to predators (CCAMLR 1991).

Clearly, both in the South African context and international declarations, objectives for fisheries management include **accounting for the requirements of predators** dependent on species targeted by fisheries. Monitoring of top predators may seek to advise how this might be accomplished.

In the Benguela system some predators may provide useful indices of the abundance of stocks of prey that are exploited by commercial fisheries (e.g. Berruti *et al.* 1993, Crawford 2003). They may also forecast recruitment to fisheries (Roux in preparation), provide information on changes in natural mortality rates of fished resources (Crawford *et al.* 1992) and changes in the distribution of fished resources (e.g. Crawford 1998, Crawford *et al.* 2002). Hence they may **provide information useful in the management of prey resources**.

Additionally, because of their position at the apex of the food chain and susceptibility to factors such as pollution, top predators have the potential to **provide indices of the state**

Objective	Population size	Breeding productivity	Diet	Prey abundance	Instruments and banding
Account for food requirements of predators	Yes	Yes	Yes	Yes	Yes
Information for management of prey resources	Yes	Yes	Yes		Yes
Indices of ecosystem health	Yes	Yes			
Monitor and update conservation status of predators	Yes				
Assess efficacy of conservation interventions	Yes				
Manage species interactions	Yes				

of health of marine ecosystems (e.g. Underhill and Crawford 2005).

Several of the top predators in the Benguela ecosystem are classified as Threatened or Near Threatened in terms of criteria of the IUCN (World Conservation Union). It is necessary to **monitor the conservation status of species of conservation concern**. Indeed, trends in the abundance of species are frequently used to **assess and update their conservation status** (e.g. Barnes 2000, BirdLife International 2000). Monitoring is useful to **assess the outcomes of conservation interventions** (e.g. Crawford *et al.* 2000, Barham *et al.* 2006).

Abundant predators may influence the conservation status of less numerous predators and it may be necessary to **manage interactions between species** (e.g. Crawford *et al.* 1989, David *et al.* 2003).

Time series of information that may prove useful in attaining the above objectives include information on:

- Population sizes (per species per breeding colony)
- Breeding productivity (per species for selected breeding localities, including breeding success and growth)
- Diet (per species for selected breeding localities)
- Abundance of prey
- Telemetry/GPS instruments and banding (for selected species) providing information on foraging areas and dispersal.

Those time series groups thought to be necessary to attain the different objectives are indicated in the table above.

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