Multifaceted approach to research and conservation of the African Penguin in South Africa

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This document provides information pertaining to recommendation A.1(*) of the 2015 International Review Panel Report for the 2015 International Fisheries Stock Assessment Workshop which states:
A.1 (*) The work since the 2014 International Workshop that was reported to the 2015 event has focused on one aspect of understanding, and ideally reversing, the decline in the numbers of African Penguins, namely whether pelagic fishing near islands impacts penguin population growth negatively. This is, however, only one aspect of the overall problem. The panel there reiterates its high priority recommendation from the 2014 workshop: "Develop and implement a comprehensive research program that aims to identify the core reasons for the reduction in penguin population numbers, and identify any potential mitigation measures" in the absence of any detailed update on this in the information provided to it.

The African Penguin population has undergone dramatic decreases in numbers over the last century. Once estimated to number in the millions at the turn of the 20th century, the South African population is currently estimated to be just *ca*. 17 300 breeding pairs (DEA unpublished data). Numerous research efforts of threats and mitigation strategies have been spurred by the continued decrease of Africa's only penguin species and important indicator of marine ecosystem health. This includes research on (but not limited to):

- **predation** (Crawford *et al.* 2001, David 2003, Johnson *et al.* 2006, Underhill 2009, Makhado *et al.* 2009, 2013, Pichegru 2013),
- **catastrophic events** e.g. oiling (Whittington 1999, 2002, Crawford *et al.* 2000, Parsons *et al*. 2005, Barham *et al*. 2007, 2008, Wolfaardt 2007, 2008),
- **human disturbance** (Buckley *et al.* 2016, Pichegru *et al.* 2016),
- disease (Randall & Bray 1983, Jones 1999, Crawford *et al.* 1992, Grim *et al.* 2003, Horne *et al.* 2011, Naude 2014),
- **genetics** (Labuschagne *et al.* 2015, 2016, Dalton *et al.* 2016,)
- **habitat** (Shelton *et al.* 1984, Crawford *et al.* 1989, Sherley *et al.* 2012, Pichegru 2013, Lei *et al*. 2014)
- **population considerations** (Seddon & van Heezik 1991, Sherley *et al*. 2014a,b, Roberts 2016, Sherley *et al.* 2013, Sherley *et al.* 2014, Tol 2015)
- **census techniques** (Shelton *et al.* 1984, Underhill *et al.* 1999, Hampton *et al.* 2009, Lubbe *et al.* 2014)
- **food availability** (Crawford and Dyer 1995, Crawford 1998, Crawford *et al.* 2006, 2007, 2008a,b, 2011, Cury *et. al*. 2011, Sherley *et al*. 2013, Connan *et al.* 2016), and
- **fisheries competition** (Pichegru *et al.* 2010, Sherley *et al.* 2015, Robinson *et al*. 2015).

Several approaches have also been used to provide an integrated overview to the threats and management of the African Penguin (Shannon *et al*. 1999, Waller 2011), including the useful recent developments of the "penguin pressure models" (Weller *et al*. 2014, 2016).

In addition, in 2013, the South African government adopted the African Penguin Biodiversity Management Plan (AP-BMP), in order to meet the terms of its National Environmental Management: Biodiversity Act (No. 10 of 2004) (DEA 2013). The first of its kind, this framework integrated discrete actions to ensure the coordination of research, management and conservation of the African Penguin. The aim of the AP-BMP is "*to halt the decline of the African Penguin population in South Africa within two years of the implementation of the management plan and thereafter achieve a population growth which will result in a down listing of the species in terms of its status in the IUCN Red List of Threatened Species*". Various actions to improve the conservation status of the African Penguin are listed in the plan, and it is hoped that by acting in concert the aim will be achieved.

The plan identifies seven major groups of threats:

1. Legislative Framework
2. Anthropogenic Impacts
3. Fish and Fishing
4. Natural Threats
5. Catastrophic Events
6. Insufficient Research
7. Insufficient Education and Awareness

The BMP-AP also called for the establishment of several working groups, in addition to the Steering Committee which have aided in the coordination of research and implementation of management towards conserving the African Penguin including

i) Population Reinforcement Working Group, which is responsible for the coordination and implementation of actions in the BMP-AP relating to:
   a. Bolstering of existing colonies
   b. The establishment of new or re-establishing of old colonies
   c. The potential release of captive-bred individuals
   d. Advice on permitting and regulation of rehabilitation and captive facilities
   e. Developing disease surveillance protocols and contingency plans
   f. Individual marking of penguins to allow for improved estimation of survival rates and movement patterns

ii) Habitat Working Group, which is responsible for :
   a. improving the breeding habitat of penguins
   b. development of improved artificial nest designs
   c. control of predators at colonies (e.g. seals and Kelp Gulls).

iii) African Penguin Scientific Technical Group, which was recently established to coordinate and enhance research related to the African Penguin and other seabirds.

We believe that the strong coordination of the numerous stakeholders involved in African Penguin research and management already existing in South Africa addresses the Panel's recommendation for a comprehensive research programme that aims to identify the core reasons for the reduction in penguin population numbers and potential mitigation thereof.

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