

Non-detriment finding for *Spheniscus demersus* (African penguin)

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Summary of findings

Spheniscus demersus (African penguin) is included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). In terms of Article IV of the Convention, an export permit shall only be granted for an Appendix II species when a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species. This document details the undertaking of a NDF (Figure 1) for the African penguin and is based on the best current available information. This information is current as of October 2015.

African penguins are long-lived and have low reproductive rates. Even though individual birds in the wild could potentially live up to approximately 20 years of age, at present very few penguins in the wild live longer than 10 years. African penguins usually breed for the first time at between four and six years of age, are considered to be monogamous, and show strong fidelity to colonies and mates as well as some nest-site fidelity. Breeding is usually colonial, but solitary nests do occur. Nests are burrows in guano or sand, in clefts between rocks, in abandoned buildings and on the surface, usually under shade. A clutch of one to two eggs are produced each year, and lost clutches may be replaced. It is possible for birds to fledge both chicks from two chick broods, but current survival estimates from hatching to fledging indicate less than one chick is fledged per pair per year.

The African penguin is considered to be an ecological specialist. The species has a narrow feeding niche and the prey range is predominantly limited to schooling pelagic fish, specifically sardines (*Sardinops sagax*) and anchovies (*Engraulis encrasicolus*). The species furthermore has a particular range of breeding habitat requirements which are only met in very few sites. At present the breeding habitat is restricted to specific offshore islands and limited mainland areas. Overall the African penguin has a good dispersal ability, although this differs at different life stages. Juveniles disperse widely along the coast, while adults generally do not. The African penguin is considered sensitive to human disturbances, but can become habituated to managed activities of people, for example at Boulders penguin colony.

The African penguin is endemic to southern Africa as a breeding species, where it breeds between Hollams Bird Island, Namibia and Bird Island, Algoa Bay, South Africa. Although the species occurs along the entire coast line, there are a limited number of breeding sites. The species is thus widespread and contiguous within its range, but fragmented in terms of breeding sites. Eleven breeding sites are situated in the Western Cape and six in the Eastern Cape. All breeding colonies in South Africa are located on coastal islands, with the exception of two mainland colonies at Boulders in Simons Town and Stony Point at Betty's Bay. Algoa Bay in the Eastern Cape is home to almost half of the global African penguin population, with the largest colony at St. Croix Island situated 7.5 km east of the newly established harbour at Coega, an industrial development zone outside of Port Elizabeth.

At present the global population of the African penguin is estimated at approximately 26 000 pairs (2009 estimate), of which South Africa has 17 263 breeding pairs (2013 estimate). This is substantially less than historical figures (for example 147 000 breeding pairs in 1956/57). Of the four *Spheniscus* species, the African penguin is the rarest and therefore the species is considered uncommon. The African penguin population is currently declining and the species was recently (November 2013) up listed from the IUCN category of Vulnerable to that of Endangered (A2ace+3ce+4ace) due to a more than 50% decline in the breeding population. Nine facilities altogether hold approximately 300 captive African penguins, which are monitored through the African penguin studbook. The size of the captive population in South Africa has been increasing due to successful breeding in captivity. African penguins exported from South Africa are excess birds as most captive facilities are at or near their carrying

capacity. Direct population estimates are used to monitor harvest and there is a high confidence in the monitoring of wild populations as well as the number of wild birds moved into rehabilitation facilities.

The species faces various threats including pollution, habitat degradation, food scarcity, climate change, human disturbance, and disease, as well as unsustainable predation of eggs, chicks, and/or adults, predominantly by kelp gulls (*Larus dominicanus*) and seals (*Arctocephalus spp.*), but also by other marine predators as well as terrestrial predators where colonies are mainland based. The major threat however is the declining abundance and availability of food resources. The lack of prey is driven by a shift in the distribution of sardine and, to a lesser extent, of anchovy from the west coast to the south coast so that the fish are now out of range of African penguins breeding on the west coast. Commercial purse-seine fisheries also compete with the African penguin for its main food source, sardines and anchovies. The declining prey availability has had cascading effects as several other species such as seals also rely on these prey species and are now in direct competition with the penguins.

From the 1840s up until 1967 penguins and eggs were collected for human consumption. This activity has since stopped and is now prohibited. A small illegal trade in feathers and eggs exists. Penguins in need of rehabilitation, such as abandoned chicks and injured or oiled birds, are however removed from the wild and taken into rehabilitation centres or captive facilities. Birds that are deemed unfit for release are subsequently incorporated into captive populations. For the period 2001 – 2014, the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB), which is responsible for the rehabilitation of more than 90% of African penguins, admitted 12 477 penguins, of which 9 393 (75%) were released back into the wild, 3 038 (24%) died and only 36 (<1%) were retained in captivity. (For the purposes of this NDF penguins not released back into the wild or that died during rehabilitation are regarded as a harvest from the wild population.) Of the 36 birds harvested by SANCCOB from 2001 – 2014, 56% were harvested from protected areas and the remainder from areas with strong resource tenure or ownership. The removal from the wild of injured or oiled penguins for rehabilitation purposes and subsequent release is an important conservation intervention, without which mortality rates of wild penguins would be significantly higher. It is likely that all 9 393 of the birds rehabilitated and released back into the wild by SANCCOB would have died if they had not been rescued. However the penguins that, in spite of this intervention, die or cannot be released do not contribute to the conservation of the species or its habitat.

African penguins are predominantly exported as captive-bred specimens at an average of about 17 live captive-bred penguins per year for the period 2002 – 2012 (CITES Trade Database, UNEP World Conservation Monitoring Centre, Cambridge, UK). Currently there seem to be an international demand for captive-bred African penguins that is largely unmet. At present, captive birds are only exported to certain facilities as part of a studbook recommendation. There is no quota for the harvest of the African penguin. The removal of birds from the wild for rehabilitation purposes occurs when the need arises, especially in the event of an oil spill. Although there is an overall high confidence in the current harvest management of penguins for rehabilitation purposes, there may be some potential for the leakage of wild birds into the trade as captive specimens. Permits are issued to facilities to allow for the rehabilitation of penguins, the only condition being a register of birds received. At present there are no standardized guidelines to determine whether a bird is fit for release or not. Thus some penguins taken into rehabilitation facilities may not always be released back into the wild when they should be.

The Biodiversity Management Plan (BMP) for the African penguin, developed in terms of the National Environmental Management: Biodiversity Act (NEMBA), 2004, requires that guidelines for the release of rehabilitated birds be developed. The drafting of these guidelines is currently underway. Management plans exist for several of the marine protected areas (MPAs) in which the African penguin occurs. The African penguin is currently listed as protected in terms of NEMBA, meaning that a permit is required if a person intends to carry out any restricted activity involving penguins such as keeping, hunting, catching, breeding, selling, conveying or exporting from the country. The permit system is regulated through the Threatened or Protected Species (TOPS) Regulations (2007), which have been promulgated in terms of the NEMBA. African penguins are also listed as a Schedule 1 (Specially Protected) species under the Western Cape's Nature and Environmental Conservation Ordinance No. 19 of 1974 and as a Schedule 2 (Protected) species under the Ciskei Nature Conservation Act No. 10 of 1987 and permits for harvesting of wild birds are currently not issued. The Seabirds and Seals Protection Act (No. 46 of 1973) makes provision for the control of certain islands and rocks; the protection and control of capture and killing of seabirds and seals; and the disposal of the products of seabirds and seals.

As the harvesting of the African penguin is currently not allowed, there is full legislative protection for the species within its natural range. Furthermore, the majority of the species' breeding and roosting sites are located within protected areas, although penguins do forage at sea beyond the boundaries of protected areas. The current regulations prohibiting harvesting other than the removals of birds in need of rehabilitation are considered to be effective.

Taking all of the above factors into consideration (Figure 1), it can be concluded that international or local trade in wild specimens would pose a moderate risk to this species in South Africa. However, this finding pertains only to those wild specimens that are taken into captivity for rehabilitation purposes and are subsequently deemed unfit for release back into the wild. Considering the poor conservation status of the African penguin, trade in healthy wild specimens would have a detrimental impact on the wild population. It is therefore recommended that exports of *S. demersus* be confined to captive-bred specimens and rehabilitated wild specimens that have been deemed unfit for release into the wild. All specimens exported must be registered in the African penguin studbook and marked with closed rings and/or micro-chipped. It is further recommended that national guidelines for the release of rehabilitated penguins must be developed within 3 months of the publication of this NDF.

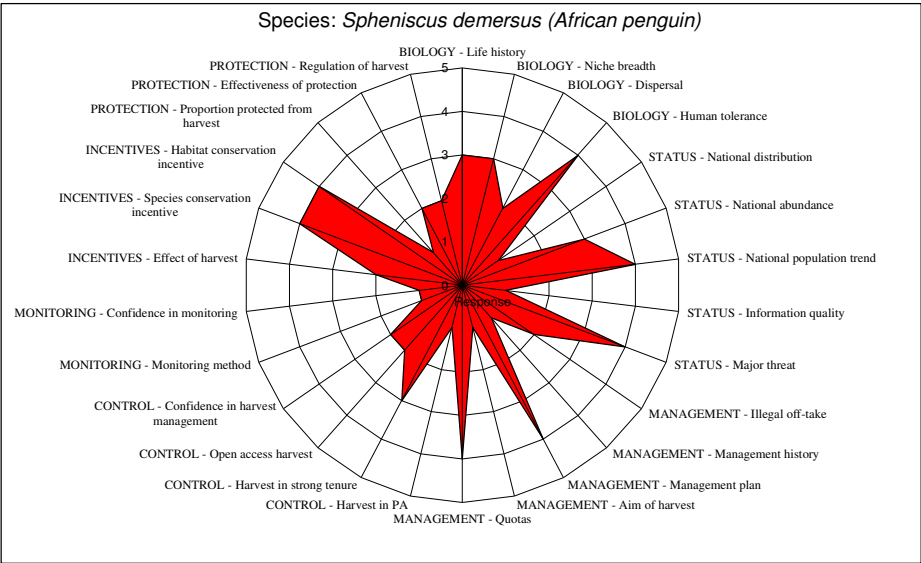


Figure 1: Radar chart summarizing the non-detriment finding assessment undertaken for *Spheniscus demersus* (African penguin) in South Africa in accordance with the CITES NDF checklist. Explanations of scores given are detailed in Table 1. Higher scores are indicative of higher risks to the species. The shaded area in the radar chart demonstrates an overall moderate to low risk to the species.

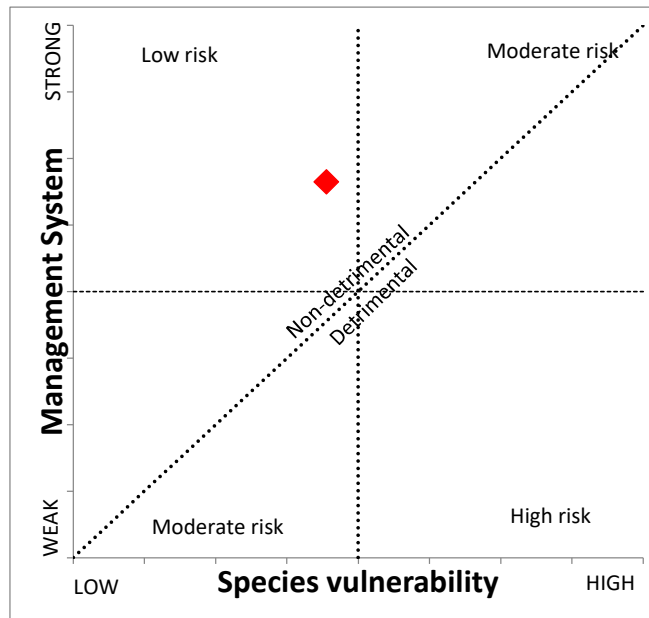


Figure 2: The level of risk of trading *Spheniscus demersus* (African penguin) by South Africa, as represented by the relationship between species vulnerability (biology and status) and the strength of the management system to which the species is subjected (management, control, monitoring, incentives and protection). The figure demonstrates that the species is assessed as at a moderate to low risk, and that trade is not detrimental.

Table 1: Detailed non-detriment finding (NDF) assessment for *Spheniscus demersus* (African penguin) in South Africa, undertaken in accordance with the CITES NDF checklist. Scores assigned to each question are indicated (bold text and shaded blocks) along with detailed explanations/justifications where relevant. Higher scores are indicative of higher risks to the species.

Biological characteristics		
1. Life history: What is the species' life history?	High reproductive rate, long-lived	1
	High reproductive rate, short-lived	2
	Low reproductive rate, long-lived	3
	Low reproductive rate, short-lived	4
	Uncertain	5
African penguins usually breed for the first time at between four and six years of age (Randall 1983, Crawford <i>et al.</i> 1999; Whittington <i>et al.</i> 2005). Once they have bred, adults generally show strong fidelity to colonies and mates as well as some nest-site fidelity (e.g. Randall <i>et al.</i> 1987; La Cock and Hanel, 1987; La Cock and Cooper 1988; Whittington <i>et al.</i> 2005). The African penguin is monogamous (Randall 1983, Crawford <i>et al.</i> 1995). On St. Croix Island 80-92% of birds whose mates did not disappear, bred with the same mate in the following year (Randall, 1983). A slightly higher percentage of 94% was recorded on Robben Island (Crawford <i>et al.</i> 1995a). Crawford <i>et al.</i> (1999) noted that clutch size for African penguins is between 1 and 2 eggs. Clutches are produced every year (although in some years, birds may not breed, especially if conditions are unfavourable), and lost clutches may be replaced. It is possible for successful breeders to also relay, producing a second clutch in the same breeding season (Randall and Randall, 1981, La Cock & Cooper 1988). It is possible for birds to fledge both chicks from two chick broods, but current survival estimates from hatching to fledging indicate less than one chick fledged per pair per year (Sherley <i>et al.</i> 2013, Ludynia <i>et al.</i> 2014). Breeding success is variable and influenced by a multitude of factors such as burrow collapse, exposure, drowning, accidental death in nest, predation by kelp gulls <i>Larus dominicanus</i>, starvation or heat stress (Seddon and Van Heezik 1991; Barham <i>et al.</i> 2007; Kemper <i>et al.</i> 2007b; Sherley <i>et al.</i> 2012, Ludynia <i>et al.</i> 2014). Studies on survival rates of African penguins have shown variation between colonies and between years, and are dependent on the age of the birds. Adult survival rate varied between 0.69 and 0.91 and that of yearlings between 0.10 and 0.89, in studies conducted during 1976-1998 at various colonies (Randall 1983; La Cock & Hänel 1987; Crawford <i>et al.</i> 1999; Whittington 2002; Kemper 2006). The most recent study showed that between 1994 and 2012, adult survival was initially high (≥ 0.74) but declined after 2003–2004 coinciding with a reduction in the availability of sardines (<i>Sardinops sagax</i>) and anchovies (<i>Engraulis encrasicolus</i>) on the west coast of South Africa (Sherley <i>et al.</i> 2014). Maximum longevity recorded is older than 27 years (Whittington <i>et al.</i> 2000, C McGeorge, unpubl. data), but low survival rates indicate that few birds will reach these older ages (Sherley <i>et al.</i> 2014). Current data show that at present very few birds live longer than 10 years. All penguins must moult annually to remain waterproof and insulated in cold waters while foraging (Stonehouse 1967, Payne 1972). Penguins become hyperphagic during the pre-moult period (Otsuka <i>et al.</i> 2000), and acquiring sufficient body reserves during pre-moult foraging can be considered a greater priority than at any other time in the annual cycle (Croxxall and Davis 1999, Wolfaardt <i>et al.</i> 2009a). High and predictable food availability during the pre-moult fattening and post moult recovery phases is thus important for survival.		
2. Ecological adaptability: To what extent is the species adaptable (habitat, diet, environmental tolerance etc.)?	Extreme generalist	1
	Generalist	2
	Specialist	3
	Extreme specialist	4
	Uncertain	5
In terms of breeding sites some form of adaptability is evident. Within the species' global distribution range, twenty-four of 28 extant breeding localities are coastal islands, caves are used at two localities on the Namibian mainland and there are two mainland localities in South Africa's Western Cape (Loutit & Boyer 1985; Bartlett <i>et al.</i> 2003; Simmons & Kemper 2003). Historically these mainland sites may not have been chosen due to probable predation from terrestrial predators. The species has a particular range of breeding habitat requirements which are only met in very few sites. At present the breeding habitat is restricted to specific offshore islands and limited mainland areas. Breeding is usually colonial, but solitary nests occur. Nests are burrows in guano or sand, in clefts between rocks, in abandoned buildings and on the surface, preferably under shade (Shelton <i>et al.</i> 1984, Crawford <i>et al.</i> 1995). Burrows are preferable as they have a more constant microclimate than surface nests, relative humidity is higher, air temperatures fluctuate less, wind		

effect is negligible and birds are not exposed to direct sunlight (Frost *et al.* 1976a). However, due to habitat destruction (guano scraping) most birds are forced to breed on the surface, which partly also explains the low breeding success (Kemper *et al.* 2007b, Sherley *et al.* 2012). African penguins are sensitive to extremes in temperature and will abandon nests to go to the sea to cool down. Lower lying nests are at risk from storm surges where eggs and chicks can be lost due to flooding.

In terms of diet, in South Africa, the African penguin feeds predominantly on schooling pelagic fish, specifically sardine *Sardinops sagax*, anchovy *Engraulis encrasicolus*, and in Namibia on the low-quality pelagic goby *Sufflogobius bibarbatus* (Crawford *et al.* 2011, Ludynia *et al.* 2010). Their feeding niche is thus very restricted. During breeding, penguins are limited to relatively small foraging ranges (20-30km around the colony), and thus depend on food availability in close vicinity to the breeding site. Reduction of food due to fishing and environmental changes around breeding colonies thus directly influences breeding success and potentially also adult survival (Pichegru *et al.* 2010, 2012).

3. Dispersal efficiency: How efficient is the species' dispersal mechanism at key life stages?	Very good	1
	Good	2
	Medium	3
	Poor	4
	Uncertain	5

The African penguin's dispersal ability differs at different life stages. Juveniles have a high dispersal ability, while adults have a low dispersal ability. Juvenile birds can disperse up to 1900 km from their natal colonies, mostly westwards and northwards (Hockey *et al.* 2005). They usually return to their natal colonies, but increases in colonies at Dyer Island, Robben Island and Boulders are attributed to immigration of first-time breeders (Crawford *et al.* 1999, Crawford *et al.* 2000, Shelton *et al.* 1984), which are considered more flexible, being able to emigrate to take advantage of long-term changes in the distribution of food (Crawford 1998). Once they have started breeding, adult birds show high breeding site fidelity. Movement of birds in adult plumage has been recorded and may be the result of changes in food availability or movements of pre-breeders (Sherley *et al.* 2014). All African penguins moult annually. Usually, they moult at their breeding colony, but there is evidence that this is changing. During the pre-moult period, penguins need to put on additional fat resources in order to survive the 21 day moult fast. Penguins can lose up to 40% of their body weight during moult, and during the post moult period, they need to replace the resources that have been used and improve their condition for breeding. During the pre- and post-moult fattening, they are not bound to their colonies, and forage large distances. Adult birds usually remain within 400 km of the breeding colonies, but can move up to 900 km in both directions along the coast (Whittington 2002, Crawford *et al.* 1995a). Breeding birds, however, remain within foraging distance of the colony, travelling a maximum of 40 km from the colony and foraging trips last less than 24 hours (Heath and Randall 1989; Petersen *et al.* 2006; Ludynia 2007; Pichegru *et al.* 2010; Waller 2011).

African penguins were able to repopulate Robben Island in the 1980s after the original population was exterminated on the island in the 1800-1900s (Shelton *et al.* 1984, Crawford *et al.* 1995b). However, in the Eastern Cape, penguins were displaced by seals on some of the islands and even though the seals are no longer occupying these islands the penguins have not yet repopulated these islands.

4. Interaction with humans: Is the species tolerant to human activity other than harvest?	No interaction	1
	Pest / Commensal	2
	Tolerant	3
	Sensitive	4
	Uncertain	5

The African penguin is considered sensitive to human disturbances, but can become habituated to managed activities of people i.e. Boulders penguin colony. In South Africa, the African penguin has established two breeding colonies (Stony Point at Betty's Bay and Boulders at Simons Town) on the mainland. Both colonies are within urban areas surrounded by residential housing and a number of nests have been constructed in private gardens. Eggs are removed by the managing authorities from nests that lie within the urban/residential area to prevent mortality from disturbance from humans and domestic animals. Since some birds lay their eggs in areas of high human activity, it could be deduced that the species may become habituated to human activity. Managed human interaction helps with tolerance levels. At Stony Point the birds nest within a meter of the boardwalk, provided that people don't run, and stay on the boardwalk. Penguins are thus likely to adapt to a regular, known disturbance. However, the level of tolerance is not clear as the species can abandon nests if disturbed on a regular basis. Higher nest failures have also been observed outside of protected areas compared to inside protected areas (unpubl. CapeNature data).

At Stony Point, Boulders and Robben Island, the species is at risk from mortality through vehicle strikes. Birds may exhibit signs of intolerance through increased stress, abandonment of chicks and/or eggs, destruction of nests and impacts on survival, due to direct human presence in the colony as a result of research, filming, eco-tourism and poachers moving through

colonies, causing disturbance to breeding birds. African penguins do not register fire as a threat, and will not flee in the event of a fire and are thus vulnerable to fires in the colony, particularly those on the mainland.

On the offshore islands, penguins are sensitive to inappropriate human approach, and may vacate the nest but will return to the site once the disturbance has passed. The species is also more sensitive at certain life stages i.e. moulting vs. breeding. When a pair has invested energy into producing an egg or chick, they will likely return to the nest after a disturbance but at other stages is likely to leave permanently. Vacating a nest as a result of disturbance often results in egg or chick predation by kelp gulls, especially from surface nests.

National status

5. National distribution: How is the species distributed nationally?	Widespread, contiguous in country	1
	Widespread, fragmented in country	2
	Restricted and fragmented	3
	Localized	4
	Uncertain	5

The African penguin is endemic as a breeding species to southern Africa, where it breeds between Hollams Bird Island, Namibia and Bird Island, Algoa Bay, South Africa (Hockey *et al.* 2005, Kemper *et al.* 2007b). Eleven localities are in Namibia, 11 in the Western Cape and six in the Eastern Cape. In South Africa, all breeding colonies are located on coastal islands, with the exception of two mainland colonies at Boulders in Simons Town and Stony Point at Bettys Bay. Algoa Bay in the Eastern Cape is home to almost half of the global African penguin population, with the largest colony at St. Croix Island, situated 7.5 km east of the newly established harbour at Coega (Port of Ngqura), an industrial development zone outside of Port Elizabeth (Crawford *et al.* 2011b).

The colony at Lambert's Bay became extinct in 2006 and the short-lived attempt by penguins to breed at De Hoop in 2008 also failed (Crawford *et al.* 2011b). Gaps in the distribution (between the Namibian population and the Western Cape and between the Western and the Eastern Cape populations, each separated by ca. 600 km) are due to a lack of appropriate coastal islands and land-based locations with limited predation risks.

The non-breeding range of the African penguin extends between ca. 18°S on the Namibian coast and 29°S on the coast of KwaZulu-Natal. Vagrant birds have been recorded north to Sette Cama (2°32'S), Gabon on the West African coast (Malbrant & MacLachy 1958), and to the Limpopo River mouth (25°S) in Mozambique on the east coast (Shelton *et al.* 1984). Even though African penguins have been recorded up to 100 km offshore (Rand 1960), most occur within 20 km of the coast (Wilson *et al.* 1988), except on the Agulhas Bank where the distribution of their prey extends farther offshore (Shelton *et al.* 1984). There are thus no barriers to gene-flow between sub populations. There are a limited number of breeding sites, but the species is distributed along the entire coast line. The species is thus widespread and contiguous within its range, but fragmented in terms of breeding sites.

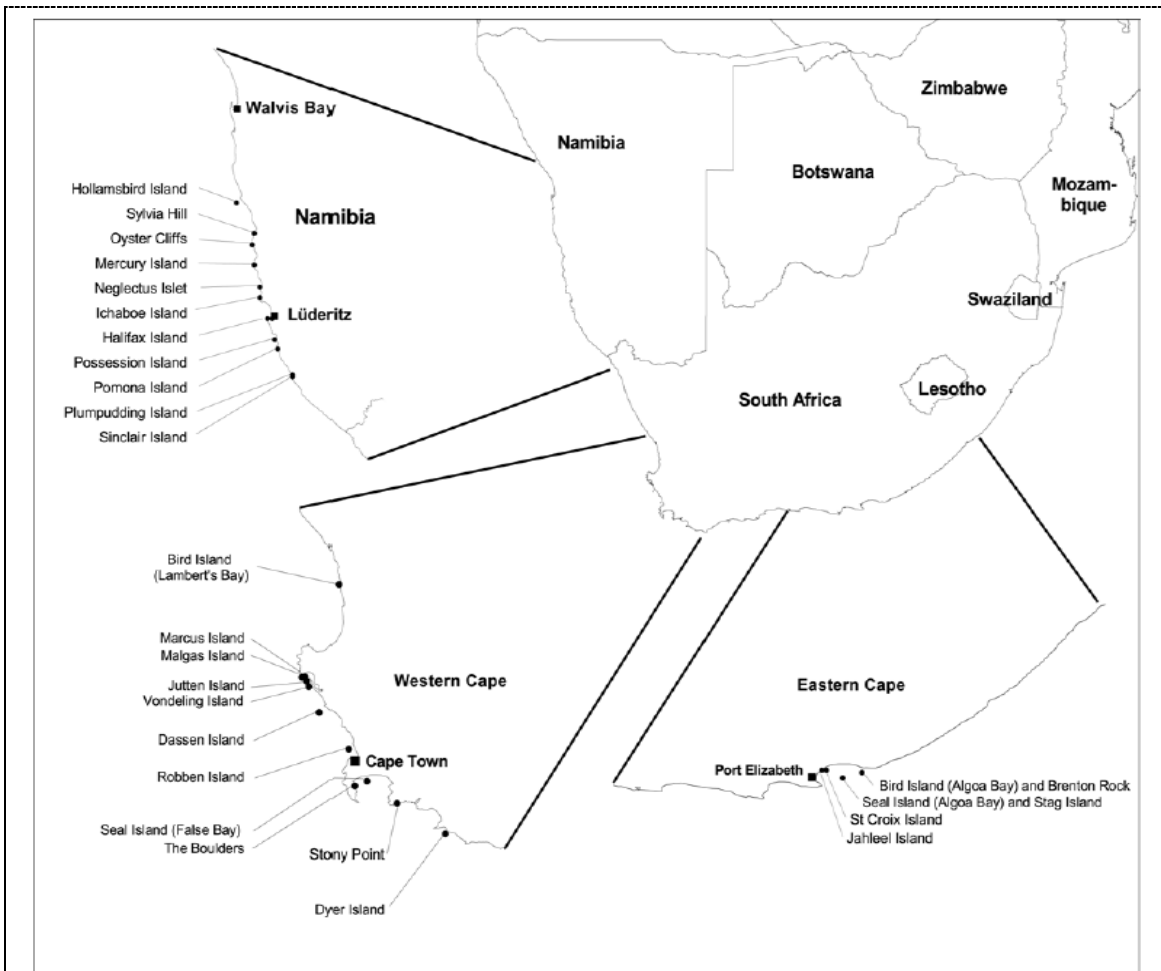


Figure 3: Breeding localities of African penguins along the southern African coast line (Crawford *et al.* 2011b).

6. National abundance: What is the abundance nationally?	Very abundant	1
	Common	2
	Uncommon	3
	Rare	4
	Uncertain	5
The estimated population size of the African penguin within South Africa for 2012 and 2013 is 18 683 and 17 263 breeding pairs respectively (Crawford <i>et al.</i> 2015; DEA:O&C unpubl. data). These figures are substantially less than historical figures (147 000 breeding pairs in 1956/57) and therefore the species is considered uncommon. At present the global population is estimated at approximately 26 000 pairs (2009 estimate) (Crawford <i>et al.</i> 2011). Of the four <i>Spheniscus</i> species the African penguin is the rarest. According to Crawford <i>et al.</i> (2001) the minimum viable population for the African penguin is approximately 50 000 breeding pairs.		
The number of birds held within captivity in South Africa is monitored through the African penguin studbook. Unfortunately, because submission to the studbook is voluntary, not all institutions contribute their data. The studbook currently contains information from nine institutions holding African penguins and indicates that there are approximately 300 birds in captivity (Table 1). According to the African penguin studbook, in order to be able to maintain a stable captive population, which retains 90% of wild heterozygosity over 100 years, it is estimated that a population size of approximately 150 animals is required. The size of the African penguin captive population in South Africa has been increasing due to successful breeding in captivity, and African penguins exported from South Africa are excess birds as most captive facilities are at or near their carrying capacity. There seem to be an international demand for captive African penguins for zoos and safari parks. At present captive birds are only exported to selected facilities as a part of a studbook recommendation (i.e. to improve genetic diversity and prevent inbreeding), but many of these facilities have healthy African penguin populations and only need a few additional birds to maintain genetic diversity periodically. Much of the demand comes from other facilities that may not be approved by current		

captive facilities and/or not part of a studbook recommendation. Alternative solutions to excess captive birds are currently being sought, and at present eggs are pricked in many captive facilities to prevent birds from breeding. The captive population may be genetically enhanced by wild birds that cannot be rehabilitated for introduction back into wild.

Table 1: The number of African penguins currently held in captive institutions in South Africa

Facility	Males	Females	Unknown sex	Total
Bester Birds & Animal Zoo Park	0	0	5	5
Cape St Francis	14	22	0	36
Durban Aquarium – uShaka Sea World	22	33	0	55
East London Aquarium	28	27	15	70
Bayworld	21	19	4	44
Pretoria National Zoo	15	16	0	31
SANCCOB Cape Town	13	19	0	32
Tenikwa Wildlife Awareness Centre	1	1	0	2
Two Oceans Aquarium	13	10	0	23
TOTAL	127	147	24	298

7. National population trend: What is the recent national population trend?	Increasing	1
	Stable	2
	Reduced, but stable	3
	Reduced and still decreasing	4
	Uncertain	5

The wild African penguin population is currently declining (Crawford *et al.* 2011b; 2015). The decline of the African penguin and concern for the future of the species were first reported by Westphal and Rowan in 1971. The magnitude of the decline however was unknown given that census data of all African penguin breeding colonies were unavailable. In 1910, it is estimated that there were about 1.5–3 million individuals (Shannon and Crawford 1999). In 1956, this figure had declined substantially to approximately 300 000 penguins (Rand 1963a,b). The next overall population assessment was conducted during the 1978/79 season when 70 000 breeding pairs (at least 140 000 penguins) were recorded, evidence of a further decline Shelton *et al.* (1984).

During the 1990s, further declines were observed where 44 000 breeding pairs in 1993 were estimated (Crawford *et al.* 1995b). A recovery was observed in the late 1990s and early 2000s, when 63 000 pairs were counted in 2001 (Kemper *et al.* 2007). However, despite this promising increasing trend in the 1990s, the reverse has occurred during the 2000s. In South Africa, the number of breeding pairs collapsed from an estimated 56 000 breeding pairs in 2001, to 21 000 pairs in 2009, and the global population in 2009 was estimated at 26 000 (Crawford *et al.* 2011). It is the rapid decline from 2004 to 2009 that has led to the re-classification of the species from Vulnerable to Endangered (A2ace+3ce+4ace)(BirdLife International 2010). The estimated population size of the African penguin within South Africa for 2012 and 2013 is 18 683 and 17 263 breeding pairs respectively (Crawford *et al.* 2015; DEA:O&C unpubl. data).

8. Quality of information: What type of information is available to	Quantitative data, recent	1
	Good local knowledge	2

describe abundance and trend in the national population?	Quantitative data, outdated	3
	Anecdotal information	4
	None	5
Population counts of African penguin breeding pairs are conducted annually at 19 sites, including Lambert's Bay, Malgas Island, Marcus Island, Jutten Island, Vondeling Island, Dassen Island, Robben Island, Boulders, Seal Island False Bay, Stony Point, Dyer Island, Geyser Island, De Hoop, Jahleel Island, Brenton Island, St Croix Island, Seal Island Algoa Bay, Stag Island, and Bird Island. Historically data collection was erratic and historical data are missing for some of the sites. Recently data have been collected more methodically and good data are available for at least the last 10-15 years. Survival estimates are based on ringed birds that are re-sighted in the wild. However, few birds have been ringed since 2000 which makes recent survival rates difficult to estimate (Sherley <i>et al.</i> 2014). Subcutaneous Passive Integrated Transponders (PIT) have been introduced as a new measure for individual identification at a few colonies (Robben Island and Stony Point) and larger scale deployment of birds with PITs and instalments of PIT readers is being planned to improve population wide information on survival and movements.		
9. Major threats: What major threat is the species facing (underline following: overuse/ habitat loss and alteration/ invasive species/ other:) and how severe is it?	None	1
	Limited/Reversible	2
	Substantial	3
	Severe/Irreversible	4
	Uncertain	5
Threats to the African penguin include pollution, habitat degradation, changes in food abundance, climate change, human disturbance, disease, predation of eggs, chicks, and/or adults by predominantly gulls and seals, but also by other marine predators as well as terrestrial predators in land based colonies. The minimum viable population for this species was estimated at 50 000 breeding pairs (Crawford <i>et al.</i> 2001; African Penguin Biodiversity Management Plan). At present the global population is estimated at 26 000 breeding pairs (Crawford <i>et al.</i> 2011). The changes in food abundance, distribution, quality and competition with fisheries and pollution are the major threats to this species is thus severe (population in continuing decline) but possibly reversible. 1. Food abundance, distribution, quality and competition with fisheries. One of the most important current threats to African penguins is considered to be the change in abundance and availability of prey (Crawford <i>et al.</i> 2007; Crawford <i>et al.</i> 2011b). The reported eastward shift past Cape Agulhas in the relative distributions of both sardines (Coetzee <i>et al.</i> 2008) and anchovy adults (Roy <i>et al.</i> 2007) is considered to have resulted in a mismatch between fish availability and seabird breeding colonies during the summer spawning period, with significant implications for seabirds of the region (Crawford <i>et al.</i> 2011b). Additionally, commercial purse-seine fisheries compete with African penguins for the birds' main prey, that of sardine and anchovy. The mismatch and intensified fishing around colonies was probably associated with the collapse of the penguin population in the Western Cape from 39 000 pairs in 2004 to 11 000 pairs in 2009, the equivalent of half the population lost (Crawford <i>et al.</i> 2011a). 2. Climate change Climate change will have an impact on water temperatures and upwelling and so will have a major impact on penguins and their prey. The recent shift in distribution of sardine and anchovy stocks may be due, in part, to climate change (Coetzee <i>et al.</i> 2008). Surface nesting birds are susceptible to heat stress and flooding, events that may be exacerbated by climate change and increased extreme weather conditions. 3. Harvesting and Habitat degradation In the early part of the 19th century egg exploitation, habitat degradation and disturbance took place as a result of guano scraping (Frost <i>et al.</i> 1976b; Shannon and Crawford 1999). Official records since 1881 showed over 13 million eggs were removed in the 30 year period 1900–1930 (Frost <i>et al.</i> 1976b). In addition, partially incubated eggs were discarded and well incubated eggs were deliberately destroyed to induce the penguins to relay so that freshly laid eggs could be collected (Frost <i>et al.</i> 1976b). Breeding birds were disturbed during this practise, causing nest desertion and predation on eggs and chicks by kelp gulls <i>Larus dominicanus</i> (Frost <i>et al.</i> 1976a). Guano harvesting destroyed breeding habitat and caused further disturbance to breeding birds, resulting in nest abandonment and subsequent kelp gull predation on eggs and small chicks. Although this practise has since ceased, guano deposits have not recovered due to the low numbers of seabirds in the 21st century. Due to the absence of guano for making burrows, African		

penguins in most colonies now breed on the surface, exposing the adults and chicks to heat stress, and eggs and small chicks to kelp gull predation. This all resulted in poor recruitment into the population in the 1900s (Shannon and Crawford 1999).

The threat to the marine environment as a result of offshore oil and gas exploration and subsequent mining is likely to have a negative impact on penguins in the future. "Virtually no knowledge exists on the underwater hearing abilities of diving birds and the sensitivity of these birds to intense anthropogenic underwater sound" (OSPAR 2009).

4. Pollution

African penguins are vulnerable to crude, fuel and fish oil spills into the marine environment. Oil affects the structure of the feathers, whereby they lose their insulating properties, resulting in the birds becoming hypothermic and having to leave the sea. They become dehydrated and use stored energy reserves, and because they cannot go to sea to forage, eventually starve to death (Wolfaardt *et al.* 2009b). Birds also ingest the oil while trying to clean themselves, causing internal physiological damage.

Oiling results from catastrophic oiling events, leaking containers, through the illegal practise of ships cleaning their bilges out at sea, diesel leaks from boats run aground or in harbours, or fish oil being dumped by factories (Wolfaardt *et al.* 2008a, 2008b, 2009b; Parsons and Underhill 2005). Oiling has affected many thousands of African penguins in the 20th and 21st century and has been identified, besides lack of food, as one of the key drivers of population decline on Robben Island (Weller *et al.* 2014).

Half the global population of the species breeds in Algoa Bay, with the largest colony at St. Croix Island situated 7.5 km from the newly established harbour at Coega (Port of Ngqura) (Crawford *et al.* 2011). The construction of a planned oil refinery at Coega and associated pipeline in the vicinity of St. Croix Island are cause for concern, as both catastrophic and chronic oil spills in this region will affect a significant proportion of the African penguin population.

Entanglements in fishing nets and discarded fishing gear, as well as ingestion of other marine debris such as plastics also causes some mortality of African penguins (Hockey *et al.* 2005).

Noise pollution in the form of marine anthropogenic noise, marine seismic surveys for oil and gas exploration, coastal and harbour development, marine construction, dredging and explosions, as well as increased shipping and marine background noise may impact negatively on penguins. However, there is a paucity of literature regarding penguin bioacoustics, from the basic anatomy of the hearing apparatus to the frequencies of sounds they can perceive above and below water. Consequently, a number of Environmental Impact Assessments (EIAs), Environmental Management Programmes (EMPs) and reports regarding such industrial developments elsewhere decry the lack of available information on the effects of marine construction and industrial activities on diving birds (SCAR 2002; OSPAR 2009; Blood 2010; Haley *et al.* 2010). Underwater explosions are known to cause mortalities in penguins (Cooper 1982; Brown & Adams 1983), and temporary or permanent hearing damage may impact vocal recognition of mates and chicks, with possible knock-on effects in terms of chick provisioning (adults unable to recognise the calls from the chicks). The threat to the marine environment as a result of offshore oil and gas exploration and subsequent mining is likely to have a negative impact on penguins in the future. "Virtually no knowledge exists on the underwater hearing abilities of diving birds and the sensitivity of these birds to intense anthropogenic underwater sound" (OSPAR 2009).

5. Predation

At sea, mortalities of African penguins occur as a result of seal predation on adults and juveniles. At Lambert's Bay and Dyer Island, predation levels are considered unsustainable (Makhado 2009). The number of Cape fur seals has increased since their protection, although they are still not at their pre-exploitation levels. Predation by Cape fur seals on seabirds was noted as far back as 1937 (Rand 1959), and indeed several species of pinniped are known to prey on various penguins. Predation on seabirds is not a common, stereotyped behaviour, but rather individuals that develop their own preferences and techniques. Some individual seals find seabirds' easy prey, and may become regular seabird predators. What may have initially started as play behaviour, or taking birds opportunistically, may develop into a habit, with birds eventually forming a large part of the diets of those individual seals that specialize in seabird predation. Other seals then learn this behaviour. Such individual seals may have a significant detrimental impact on the local seabird population, such as at Bird Island in Lambert's Bay where seals have been directly involved in the extinction of the local colony of African penguins. Targeted predator control may be a necessary conservation intervention. However, it needs to be noted that the interaction between seals and penguins in terms of competition for food, direct predation, and displacement from breeding areas are all natural interactions, but that the impact and severity of these interactions have become a conservation concern principally due to the low numbers of African penguins, whose population decline is more directly attributable to human interactions (guano collection, egg collection, competition for food, oil and other pollution) (du Toit *et al.* 2004). The great white shark *Carcharodon carcharias* is known to predate on African penguins (Johnson *et al.* 2006, Makhado *et al.* 2013). The number of kelp gulls at some colonies has increased steadily and is a source of mortality of African penguin eggs and small chicks (Kemper *et al.* 2007a, Ludynia *et al.* 2014). Mainland colonies

are at risk from many of the natural predators (jackals, mongoose, genets, etc.) and “introduced” predators (dogs, cats, mice etc.) that easily gain access to the colonies.

6. Disease

Diseases known to cause mortality in African penguin colonies include heavy trematode *Cardiocephaloides physalis* infestations of the small intestines of chicks and recently fledged juveniles at St Croix Island (Randall and Bray 1983). Haemoparasites such as avian malaria have been found in wild African penguins, but incidences of this are negligible, for example 0.7% of penguins from Saldanha Bay (Brossy 1992; Brossy *et al.* 1999).

Harvest management

10. Illegal off-take or trade: How significant is the national problem of illegal or unmanaged off-take or trade?	None	1
	Small	2
	Medium	3
	Large	4
	Uncertain	5

Wild African penguins in need of rehabilitation, such as abandoned chicks, injured or oiled birds are taken under permit into rehabilitation centres or captive facilities. Birds that are deemed not releasable are incorporated into captive populations. There are however no national criteria for deciding whether a bird is releasable or not. There is an estimated 300 birds in captivity, a small and insignificant number compared to the wild population.

There is no known large scale illegal removal of guano, eggs, chicks and/or adults. There is however a small illegal trade in the collection of feathers, and eggs. There are current cases under investigation of egg collection by Asians (Chinese) for medicinal purposes, as well as some anecdotal reports. There have been some observations made at Stony Point to suggest that the poaching of eggs may occur, albeit at low levels currently (as at 2015).

11. Management history: What is the history of harvest?	Managed harvest: ongoing with adaptive framework	1
	Managed harvest: ongoing but informal	2
	Managed harvest: new	3
	Unmanaged harvest: ongoing or new	4
	Uncertain	5

From the 1840s up until 1967 penguins and eggs were collected for human consumption. This activity has since stopped and the removal of penguins and eggs from the wild is prohibited.

Only penguins in need of rehabilitation, such as abandoned chicks, injured or oiled birds are currently legally removed from the wild. This is an accepted conservation intervention since the birds are returned to the wild, and is managed for the benefit of the species. Only the birds deemed not fit for release are subsequently incorporated into captive populations, however this generally applies to small numbers of penguins. For the period 2001 – 2014, the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB) admitted 12 477 penguins, of which 9 393 were released back into the wild and 3 038 died. Only 36 of these birds were retained in captivity. More than 90% of African penguins are rehabilitated by SANCCOB. The decision on whether or not a bird is releasable is made by the individual institution and there are currently no national criteria to guide decision making. For the purposes of this NDF, harvest includes the removal of penguins from the wild for rehabilitation purposes, the net offtake being those birds that cannot be released back into the wild and those that die due to their injuries/condition.

According to the CITES Trade Database (UNEP World Conservation Monitoring Centre, Cambridge, UK) approximately 189 live captive penguins were exported from South Africa from 2002 – 2012, averaging about 17 penguins per year. In 2009, 20 wild African penguins were re-exported live from South Africa to Namibia for release back into the wild. These birds had been imported to South Africa for rehabilitation at SANCCOB after an oil spill in Namibia. Other than the above mentioned export, no live wild penguins were exported from South Africa for any purposes. Currently there appears to be an international demand for captive-bred African penguins that is largely unmet. At present, captive birds are only exported to reputable facilities as a part of a studbook recommendation. Many of these facilities already have healthy populations of African penguins and occasionally require only a few additional birds to maintain genetic diversity. Alternative solutions to address the excess of African penguins in captivity are currently being sought. In many captive facilities eggs are pricked to prevent penguins from breeding. Captive populations are occasionally genetically enhanced by wild birds that cannot be released back into wild.

12. Management plan or equivalent: Is there a	Approved and co-ordinated local and national management plans	1
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management plan related to the harvest of the species?	Approved national/state/provincial management plan(s)	2
	Approved local management plan	3
	No approved plan: informal unplanned management	4
	Uncertain	5
There is currently no agreed plan to guide decision making in relation to the release of birds removed from the wild for rehabilitation purposes. Legislation does not specifically address the release of rehabilitated birds. A Biodiversity Management Plan (BMP) has been published on 31 October 2013 for the African penguin in terms of the National Environmental Management: Biodiversity Act (NEMBA), 2004. In accordance with the actions set out in the BMP, guidelines for the release of rehabilitated penguins are to be developed. These guidelines are currently being developed and should be completed towards the end of 2017. The African penguin is listed in Appendix II of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) however there is as yet no international agreement between countries for this species, however an agreement in terms of the CMS would need to include Angola, Namibia, South Africa, and Mozambique. Management plans exist for several of the marine protected areas in which the African penguin occurs. These plans detail management interventions to mitigate threats to colonies and reduce mortality of penguins.		
13. Aim of harvest regime in management planning: What is harvest aiming to achieve?	Generate conservation benefit	1
	Population management/control	2
	Maximize economic yield	3
	Opportunistic, unselective harvest, or none	4
	Uncertain	5
Only penguins in need of rehabilitation, such as abandoned chicks (bolstering – collection and rearing of abandoned chicks), injured or oiled birds, are harvested. At present there are no national guidelines for deciding when a rehabilitated penguin is releasable. The decision is made on an informal basis by the institution that accepted the bird for rehabilitation purposes. Birds deemed non-releasable and retained in captivity are thus a consequence of a conservation intervention. Guidelines for the rescuing, rearing and releasing of abandoned chicks are being developed to encourage the incorporation of non-releasable birds into a conservation captive breeding programme. The harvesting of penguins in need of rehabilitation is aimed at generating a conservation benefit, without which mortality rates of wild penguins would be significantly higher. It is likely that 100% of the birds collected for rehabilitation and released back into the wild would have died if they had not been rescued. The non-releasable birds are potentially valuable for future reintroductions and enhance the genetic diversity of the captive population. They are also important for education purposes.		
14. Quotas: Is the harvest based on a system of quotas?	Ongoing national quota: based on biologically derived local quotas	1
	Ongoing quotas: “cautious” national or local	2
	Untried quota: recent and based on biologically derived local quotas	3
	Market-driven quota(s), arbitrary quota(s), or no quotas	4
	Uncertain	5
There is no quota for the harvest of the African penguin. The removal of birds from the wild for rehabilitation is conducted when the need arises, especially when large numbers of birds are affected for example by an oil spill.		
Control of harvest		
15. Harvesting in Protected Areas: What percentage of the legal national harvest occurs in State-controlled Protected Areas?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5
For the purposes of this NDF, harvest includes the removal of penguins from the wild for rehabilitation purposes, the net offtake being those birds that cannot be released back into the wild and those that die due to their injuries/condition. Of the 36 penguins retained in captivity by SANCCOB during the period 2001 – 2014, 56% were harvested from protected areas.		
16. Harvesting in areas with strong resource tenure or ownership: What percentage of the legal national harvest occurs	High	1
	Medium	2
	Low	3
	None	4

outside Protected Areas, in areas with strong local control over resource use?	Uncertain	5
For the purposes of this NDF, harvest includes the removal of penguins from the wild for rehabilitation purposes, the net offtake being those birds that cannot be released back into the wild and those that die due to their injuries/condition. Of the 36 penguins retained in captivity by SANCCOB during the period 2001 – 2014, 44% were harvested outside of protected areas. Boulders Beach is part of the Table Mountain National Park and although public access is allowed it is controlled and monitored – there is an admission gate and field rangers on duty. The movement of penguins are however not restrict to the national park property and they do nest outside the park where public can gain uncontrolled access to the area. Stoney Point, although not an officially proclaimed reserve, it is managed as one, with access control and monitoring of the public by rangers. Furthermore the public is restricted to a raised boardwalk which reduces the disturbance factor to a degree. All other beaches are accessible to the public.		
17. Harvesting in areas with open access: What percentage of the legal national harvest occurs in areas where there is no strong local control, giving <i>de facto</i> or actual open access?	None	1
	Low	2
	Medium	3
	High	4
	Uncertain	5
None. Boulders Beach is part of the Table Mountain National Park and although public access is allowed it is controlled and monitored – there is an admission gate and field rangers on duty. The movement of penguins are however not restrict to the national park property and they do nest outside the park where public can gain uncontrolled access to the area. Stoney Point, although not an officially proclaimed reserve, it is managed as one, with access control and monitoring of the public by rangers. Furthermore the public is restricted to a raised boardwalk which reduces the disturbance factor to a degree. All other beaches are accessible to the public.		
18. Confidence in harvest management: Do budgetary and other factors allow effective implementation of management plan(s) and harvest controls?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5
There is an overall high confidence in the current harvest management of penguins for rehabilitation purposes, but there may be some potential for leakage of wild birds into the trade as captive specimens. Permits are issued to facilities to allow for the rehabilitation of penguins, the only condition being a register of birds received. At present there are no standardized guidelines to determine whether a bird is fit for release or not. Thus some penguins taken into rehabilitation facilities may not always be released back into the wild when they should. Currently a permit is required from both the Department of Environmental Affairs (DEA) and the relevant Provincial Conservation Authority in terms of various legislative instruments such as TOPS, Seabirds and Seals Protection Act (No. 46 of 1973) and the relevant provincial ordinances.		
Monitoring of harvest		
19. Methods used to monitor the harvest: What is the principal method used to monitor the effects of the harvest?	Direct population estimates	1
	Quantitative indices	2
	Qualitative indices	3
	National monitoring of exports	4
	No monitoring or uncertain	5
Breeding pairs, moulting adults and juveniles are regularly counted at the most populous penguin colonies, providing good population estimates for this species. Marked individuals are regularly monitored at a number of colonies.		
The African penguin is listed on Appendix II of CITES and exports are monitored through the reporting of CITES permits issued. The African penguin is currently listed as protected in terms of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), meaning that a permit is required if a person intends to carry out any restricted activity involving penguins such as keeping, hunting, catching, breeding, selling, conveying or exporting from the country. The permit system is regulated through the Threatened or Protected Species (TOPS) Regulations (2007), which have been promulgated in terms of NEMBA. African penguins are also listed as a Schedule 1 (Specially Protected) species under the Nature and Environmental Conservation Ordinance No. 19 of 1974 and as a Schedule 2 (Protected species) under the Ciskei Nature Conservation Act no. 10 of 1987 and no permits for harvesting of wild birds are being issued.		

The Seals and Seabirds Protection Act (No. 46 of 1973) makes provision for the control of certain islands and rocks; the protection and control of capture and killing of seabirds and seals; and the disposal of the products of seabirds and seals.		
The Policy on the Management of Seals, Seabirds and Shorebirds (2007) aims to reduce mortality rates of the African penguin caused by bycatch, introduced predators, insufficient food, displacement from breeding sites, degradation of breeding habitat, disturbance by humans, destruction of nests, oil pollution, and other forms of pollution.		
20. Confidence in harvest monitoring: Do budgetary and other factors allow effective harvest monitoring?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5
There is a high confidence in the monitoring of wild African penguin populations as well as the number of wild birds moved into rehabilitation facilities.		
Incentives and benefits from harvesting		
21. Utilization compared to other threats: What is the effect of the harvest when taken together with the major threat that has been identified for this species?	Beneficial	1
	Neutral	2
	Harmful	3
	Highly negative	4
	Uncertain	5
The species is currently declining and any permanent removal from the wild is thus detrimental. The removal of abandoned chicks and injured or oiled birds which are subsequently rehabilitated and returned to the wild is a conservation intervention for the benefit of the species. At present, birds which are not fit for release into the wild do not contribute to the growth of the population in the wild.		
22. Incentives for species conservation: At the national level, how much conservation benefit to this species accrues from harvesting?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5
The birds removed from the wild due to injuries etc. that either die or are not releasable do not contribute to the conservation of the species. For the purposes of this NDF, the wild penguins removed for rehabilitation purposes that are not returned to the wild are regarded as a permanent harvest from the wild population. Breeding with non-releasable birds would potentially have a conservation benefit if the chicks, upon fledging, are immediately released, thus replicating their natural behaviour. No human contact would have to occur in captivity. The non-releasable birds in captivity form part of an assurance population and are also used for education purposes. They do therefore indirectly contribute to conservation.		
23. Incentives for habitat conservation: At the national level, how much habitat conservation benefit is derived from harvesting?	High	1
	Medium	2
	Low	3
	None	4
	Uncertain	5
There is no legal harvest of the species and therefore no habitat conservation benefit can be derived from harvesting.		
Protection from harvest		
24. Proportion strictly protected: What percentage of the species' natural range or population is legally excluded from harvest?	>15%	1
	5-15%	2
	<5%	3
	None	4
	Uncertain	5
Harvesting of the African penguin is not allowed and therefore by default there is 100% protection of the species within its natural range. Furthermore, the majority of the species' breeding and roosting sites are all within protected areas. The penguins do, however, forage out to sea beyond the boundaries of protected areas (even MPAs), but the existing legislation (NEMBA,		

TOPS Regulations, National Seal and Seabird Policy and Provincial Ordinances) prevent any form of use. The only birds that can legally be removed are those in need of rehabilitation.

Harvesting of the African penguin is regulated through the Nature and Environmental Conservation Ordinance No. 19 of 1974 and the Ciskei Nature Conservation Act no. 10 of 1987. The African penguin is currently listed as protected in terms of section 56 of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA), meaning that a permit is required if a person intends to carry out any restricted activity involving penguins such as keeping, hunting, catching, breeding, selling, conveying or exporting from the country. The permit system is regulated through the Threatened or Protected Species (TOPS) Regulations (2007), which have been promulgated in terms of NEMBA. The Seabirds and Seals Protection Act (No. 46 of 1973) further makes provision for the control of certain islands and rocks; the protection and control of capture and killing of seabirds and seals; and the disposal of the products of seabirds and seals.

25. Effectiveness of strict protection measures: Do budgetary and other factors give confidence in the effectiveness of measures taken to afford strict protection?	High confidence	1
	Medium confidence	2
	Low confidence	3
	No confidence	4
	Uncertain	5

There is no illegal harvesting of African penguins and, as far as can be determined, no demand for wild specimens of the species. It is therefore unclear if the absence of illegal harvesting is because there is no or very little demand for the species or because the species is well protected. The majority of the species' breeding and roosting sites are located within protected areas. The penguins do, however, forage out to sea beyond the boundaries of protected areas (even MPAs), but the existing legislation (NEMBA, TOPS Regulations, National Seal and Seabird Policy and Provincial Ordinances) prevent any form of use. The only birds that can legally be removed are those in need of rehabilitation.

As most wild penguins occur within protected areas, the prevention of illegal offtake is sufficient and effective. The levels of protection however vary from colony to colony. The Boulders area is equipped with cameras, while residents are very protective of the colony and many officials are employed to manage and protect the colony with rangers collecting stray birds. The Stony point colony is easier to access than Boulders, has fewer staff and there are no cameras. Permanently staffed islands include Dassen, Robben, Dyer and Bird islands, so access control is likely to be higher. There is no permanent presence of nature conservation officials on St Croix Island due to the inaccessibility of the island, and thus illegal access is unlikely although the confidence to enforce controls at this colony is low. Nature conservation officials are based at the one end of Dassen island, leaving the other end of the island easily accessible as there is no access control. The penguins on this side of the island are thus vulnerable to disturbance.

26. Regulation of harvest effort: How effective are any restrictions on harvesting (such as age or size, season or equipment) for preventing overuse?	Very effective	1
	Effective	2
	Ineffective	3
	None	4
	Uncertain	5

Harvesting of the African penguin is not allowed. The only birds that can legally be removed are those in need of rehabilitation. This restriction is regarded as effective.

List of Workshop participants

1. Jeanetta Selier SANBI
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3. Kevin Shaw CapeNature
4. Lauren Waller CapeNature
5. Millicent Makoala DEA: Branch Oceans & Coasts (arrive 10am)
6. Vanessa Strauss SANCCOB
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8. Monique Ruthenberg SANParks
9. Len Freeman Tenikwa
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11. Judy Mann SAAMBR
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