Risk Assessment for the conservation translocation of captive bred African Penguins (*Spheniscus demersus*)

CONSERVATION BREEDING SPECIALIST GROUP
Planning a Future for Wildlife

PAAZAB
AFRICAN ASSOCIATION OF ZOOS & AQUARIA

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Contents

Cover picture: African Penguin at Stony Point, Western Cape, South Africa. © Mike Jordan

This risk assessment was compiled by CBSG / PAAZAB under the auspices of the African Penguin Population Reinforcement Working Group of the South African Biodiversity Management Plan. A group comprising representatives of; African Association of Zoos & Aquaria (PAAZAB), Animal Demography Unit of the University of Cape Town, BirdLife South Africa, Bristol Zoological Gardens, CapeNature, Conservation Breeding Specialist Group of IUCN SSC (CBSG), Department of Environmental Affairs (Oceans & Coast), Robben Island Museum, South African Foundation for the Conservation of Coastal Birds (SANCCOB) and South African National Parks (SANParks).

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Introduction

This risk assessment has been produced to assist in the decision making surrounding the conservation translocation of African Penguins (*Spheniscus demersus*). Conservation translocation represents just one, of many tools, to assist in the conservation of the African Penguin, complimentary to, and in no way replacing other actions such as colony protection, fish stock management and *ex situ* breeding. This risk assessment sets out neither to advocate for, nor oppose, the process of conservation translocation, but rather it provides a framework upon which to appraise proposed conservation actions involving conservation translocation. All conservation actions for the species should be carried out as part of an integrated strategy under the 'Biodiversity Management Plan for the African Penguin' (2013).

It was specifically written to consider the conservation translocation of captive bred African Penguins, as the conservation translocation of wild bred individuals is already a well established and accepted practice, with many hundreds of individuals being released annually as part of welfare rehabilitation programmes, and more recently as part of conservation and research programmes. However the conservation translocation of captive bred individuals is not inherently or necessarily of any higher risk than that of wild bred individuals therefore this risk assessment provides a tool for appraising all conservation translocations, whilst focussing on any potential differences between wild and captive sources of penguins.

Any proposed conservation translocation should be justified by identifying the conservation benefits and weighing any benefits against risks, while considering alternative actions that could be taken. Motivations such as experimenting solely for academic interest, releasing surplus captive stock, rehabilitation for welfare purposes, attracting funding or public profile, or moving organisms to facilitate economic development are not generally regarded as conservation purposes.

Background – African Penguin

For a full account of African Penguin biology, status and conservation actions please refer to the 'Biodiversity Management Plan for the African Penguin (2013)'.

The African Penguin is an endemic Southern African colonially breeding species with its usual distribution extending from Namibia southwards around the coastline to KwaZulu-Natal in South Africa. It currently breeds at 28 known localities, 24 of which are islands. It was believed at one time to have been South Africa's most abundant seabird but has suffered massive declines over the last hundred years from around one million pairs down to just 25,000 pairs in 2009, with the decline continuing. It is categorised as Endangered on the global IUCN red list as a result of the continuing decline exceeding 50% in the last three generations.

Multiple and changing factors are believed to have been responsible for this decline; including egg collection for human consumption, guano harvesting altering nesting behaviour rendering them

more susceptible to predation, human disturbance, oil spills and increasingly shifting fish stocks resulting in a mismatch between areas of high fish abundance and traditional breeding colonies.

The 'Biodiversity management Plan for the African Penguin (2013)' sets out the South African conservation strategy for the species and actions relating to three objectives of the plan specifically concern potential conservation translocation;

> Objective 4.1.5: To secure the protected status of all extant African Penguin colonies, including those not currently formally protected, and to consider the establishment of new breeding sites.
>
> Objective 4.2.4: To account for and regulate all penguins kept in captivity in South Africa, and to determine guidelines for rehabilitation and release of penguins.
>
> Objective 4.2.6: To halt, and if possible reverse, further decline or loss of colonies and to prevent further fragmentation of the African Penguin population.

Background – Conservation Translocation

For a detailed account of the process of conservation translocation please refer to the 'Guidelines for reintroductions and other conservation translocations, version 1.0 (2013)' of the IUCN SSC.

Conservation translocation is the deliberate movement of organisms from one site for release in another. It must be intended to yield a measurable conservation benefit at the levels of a population, species or ecosystem, and not only provide benefit to translocated individuals.

Translocation is an effective conservation tool but its use either on its own or in conjunction with other conservation solutions needs rigorous justification. Individual project feasibility assessment should include a balance of the conservation benefits against the costs and risks of both the translocation and alternative conservation actions.

Design and implementation of conservation translocations should follow the standard stages of project design and management, including gathering baseline information and analysis of threats, and iterative rounds of monitoring and management adjustment once the translocation is underway This ensures that process and progress are recorded; changes in translocation objectives or management regime can then be justified, and outcomes can be determined objectively.

A number of different types of conservation translocation can be recognised and these are defined here for clarity, particularly as some types are inherently more risky than others. The overarching term **Conservation Translocation** is the '*intentional movement and release of a living organism where the primary objective is a conservation benefit: this will usually comprise improving the conservation status of the focal species locally or globally, and/or restoring natural ecosystem functions or processes.'*

Conservation translocation can be divided into two broad categories dependent upon whether or not it takes place within the indigenous range of the species being translocated. The **indigenous range** of a species *is the known or inferred distribution generated from historical (written or verbal)*

records, or physical evidence of the species' occurrence. Where direct evidence is inadequate to confirm previous occupancy, the existence of suitable habitat within ecologically appropriate proximity to proven range may be taken as adequate evidence of previous occupation.

In the case of the African Penguin the indigenous range should be considered as the usual non-breeding range extending along approximately 3200 km of coastline from 18°S on the west coast of Namibia to 29°S on the east (KwaZulu-Natal) coast of South Africa.

Population Restoration is any conservation translocation to within indigenous range, and comprises two activities:

- **Reinforcement** is the intentional movement and release of an organism into an existing population of conspecifics.

  Reinforcement aims to enhance population viability, for instance by increasing population size, by increasing genetic diversity, or by increasing the representation of specific demographic groups or stages.

  [Synonyms: Augmentation; Supplementation; Re-stocking; Enhancement]

- **Reintroduction** is the intentional movement and release of an organism inside its indigenous range from which it has disappeared.

  Reintroduction aims to re-establish a viable population of the focal species within its indigenous range.

Generally the risks associated with population restorations are less and the assessment of risks for reinforcement and reintroduction are simpler than for conservation translocation outside of indigenous range.

Conservation Introduction is the intentional movement and release of an organism outside its indigenous range; two types of Conservation Introduction are recognised:

- **Assisted Colonisation** is the intentional movement and release of an organism outside its indigenous range to avoid extinction of populations of the focal species.

  This is carried out primarily where protection from current or likely future threats in current range is deemed less feasible than at alternative sites.

  The term includes a wide spectrum of operations, from those involving the movement of organisms into areas that are both far from current range and separated by non-habitat areas, to those involving small range extensions into contiguous areas.

  [Synonyms: Benign Introduction; Assisted Migration; Managed Relocation]

- **Ecological Replacement** is the intentional movement and release of an organism outside its indigenous range to perform a specific ecological function.

> This is used to re-establish an ecological function lost through extinction, and will often involve the most suitable existing sub-species, or a close relative of the extinct species within the same genus.
>
> [Synonyms: Taxon Substitution; Ecological Substitutes/Proxies/Surrogates; Subspecific Substitution, Analogue Species]

Given the extensive movements of African Penguins within their indigenous range, all the current proposed conservation translocations for the African Penguin could be considered as reinforcements; all likely to fall within the indigenous range. Those that are proposed to investigate the establishment of new breeding colonies are within the current non-breeding range and therefore are best considered as reinforcements intended to establish or re-establish breeding behaviour at a site. In the context of conservation translocation science one of the key differences between reinforcements and reintroductions is the likelihood of translocated individuals contacting and interacting with con-specifics. Clearly establishing new breeding colonies within the current range of African Penguins will involve the translocated birds contacting and interacting with existing penguins and therefore these releases may be best viewed as reinforcements.

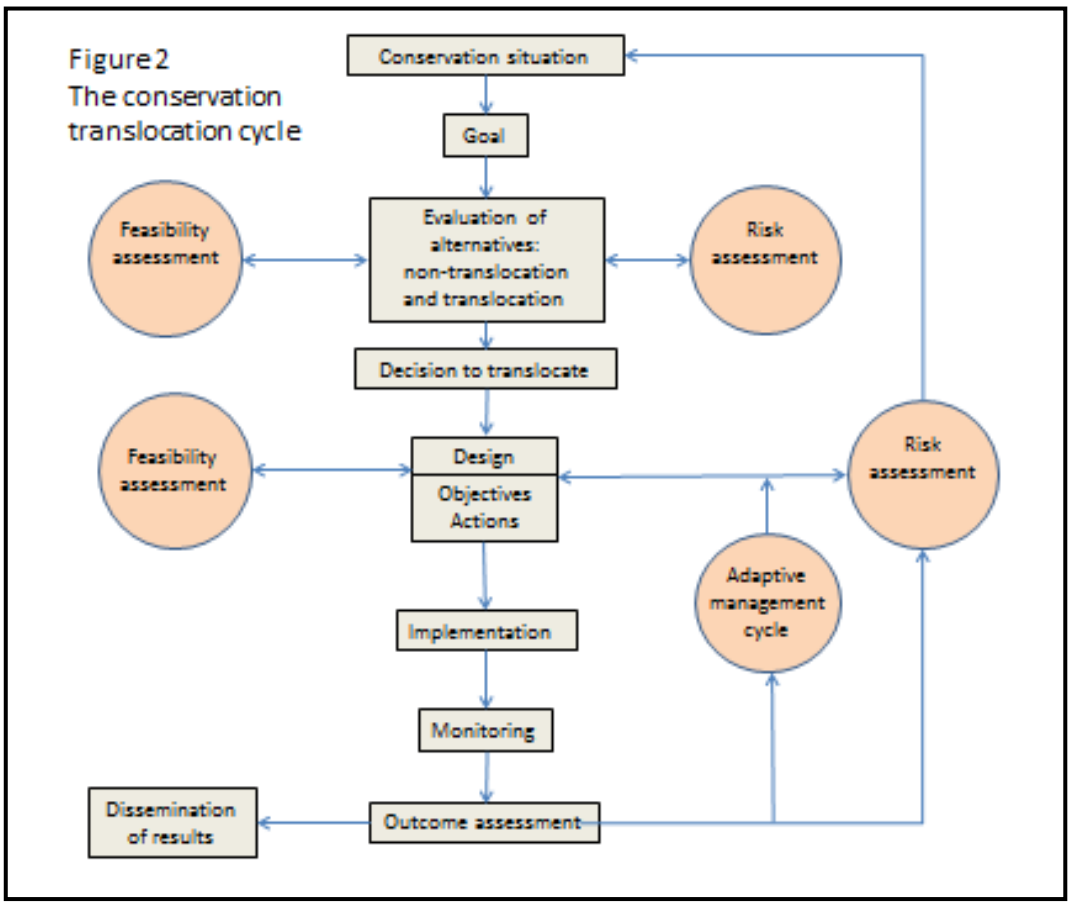
Reinforcements are generally considered a lower risk conservation translocation. However if in the future Conservation Introduction is considered for the African Penguin then global evidence shows that introductions of species outside their indigenous range can frequently cause extreme, negative impacts that can be ecological, social or economic, are often difficult to foresee, and can become evident only long after the introduction.

Conservation translocations outside indigenous range may, therefore, bring potentially high risks that are often difficult or impossible to predict with accuracy. Therefore justifying a conservation introduction requires an especially high level of confidence over the organisms' performance after release, including over the long-term, with reassurance on its acceptability from the perspective of the release area's ecology, and the social and economic interests of its human communities.

Every conservation translocation should have clearly defined goals which articulate the intended conservation benefit. This is particularly important for risk assessment, as appraisal of the benefits is essential for balancing the perceived risks in the context of the conservation of the species/ecosystem in question and deciding upon whether to proceed with conservation translocation. They should follow a logical step-wise process where outcome assessment is fed-back to improve translocation objectives and design**. (See figure 1.)**

Figure 1.

The conservation translocation cycle (from figure 2 of the IUCN SSC Guidelines for reintroductions and other conservation translocations (2013))



Process and limitations

Every conservation translocation bears risks that it will not achieve its objectives and/or will cause unintended damage. These risks though have to be viewed proportionally and must be balanced against the potential conservation benefits that may be accrued from the conservation translocation.

Risk assessment is an essential component of all conservation translocation, regardless of whether the activity is potentially a lower risk activity such as population restoration or a potentially higher risk activity such as conservation introduction. Risk assessments have to be able to deal with uncertainty and should be proportional and appropriate. They need not be over onerous if risks are considered low, but must be robust enough to genuinely appraise risks to populations. Both

qualitative and quantitative assessments are acceptable and most risk assessments combine the two by allocating subjective (qualitative) scores to broad categories to achieve quantitative risk assessment.

As every decision on whether to translocate or not relies upon the absolute level of risk being balanced against the scale of expected benefits, this generic risk assessment should be applied on a project by project basis and individual decisions may vary. Two projects deemed to carry exactly the same risks may well vary in outcome of whether to translocate or not dependent upon the goals and anticipated conservation benefit.

It should also be noted that the risks from conservation action, or inaction, change with time. For example, if a translocation from a relatively numerous population is contemplated, the major risk is to the destination ecosystem; as the size of the source population declines, the risk to this population increases while for that of the destination remains the same; hence, the overall risk of the translocation not delivering conservation benefit is increased by not taking action in good time.

This risk assessment focuses on the conservation translocation of African Penguins that have been bred in captivity. However captive bred individuals do not inherently pose any greater risk than translocating their wild conspecifics. Common concerns over disease or genetic issues can be considered as a scaled risk which varies with the circumstance and control measures put in place; thus the translocation of a wild individual from a small, isolated, highly inbred population with endemic disease agents may prove a much higher risk than that of the translocation of a captive bred individual from a regularly health screened and genetically managed population. Thus one circumstance cannot automatically be considered as higher risk than the other. Of particular significance in any risk assessment are the control measures recommended to be in place to reduce the scale of this risk. Thus health screening is an important control measure to reduce the scale of the risk associated with unintended disease introduction. These control measures should be important parts of project specific protocols when designing conservation translocation programmes.

This risk assessment is organised in line with the revised 'IUCN SSC Guidelines for reintroductions and other conservation translocations (2013)'. Table 1. considers each of the seven main risk categories (applicable to all conservation translocation) and for each identifies main hazards considered potentially (even if in some cases unlikely) to be of concern with the release of captive bred penguins (*in some cases notes are made where there are other pertinent hazards relevant to the release of wild bred individuals*), for the purpose of this risk assessment 'penguins' includes eggs, juveniles and adults. For each hazard there are recommended control measures; these are cautionary comments and associated actions that should be in place to manage and reduce the scale of the hazard.

The likelihood and severity of each hazard in light of these control measures is scored (in broad categories) and the combination of the likelihood of a controlled hazard occurring, combined with its potential severity (these two scores), gives an overall risk score which represents the 'risk landscape' for that hazard (low, medium or high). This overall 'risk landscape' should then be applied to individual proposals in light of their intended conservation benefits to assist in deciding whether to proceed with conservation translocation.

There are also institutional/organisational risks associated with conservation translocation which are complex and very partner specific. Project partners need to consider these, but they cannot be included in a generic risk assessment. These relate to the mission and public profile of the institution/organisation, therefore different organisations may have completely different risk landscapes relating to success or failure of the conservation translocation; it must also be remembered that similar institutional/organisational risks can be associated with perceived failure to act for the conservation of a species.

Risk Assessment summary

Table 1. assesses the risks of conservation translocation of captive bred African Penguins in 13 broad hazards (two of these 13 are hazards applicable only to wild translocated penguins). For each hazard appropriate control measures are given. For six of the 13 hazards it is noted that they are also considered equally applicable to the conservation translocation of wild origin penguins, while for a further five hazards they are applicable to wild origin penguins under certain circumstances; dependent upon the stage at which they are removed from the wild and the duration of their period *ex situ*.

With the appropriate recommended control measures implemented 12 of the 13 hazards are considered 'low risk', and only one is considered 'medium risk', which is;

- **Risk to source populations***: (for healthy wild origin individuals - risk of removal excessively reducing viability of the colonies from which penguins are removed.)*

  Recommended control measure: *(If healthy wild penguins are removed from colonies then a viability analysis should be conducted beforehand to ensure that the removal does not impact colony viability, or if so then this is offset by predicted increase in viability resulting from the translocation.)*

As is evident this medium risk hazard is applicable to wild origin individuals only. The overall 'risk landscape' associated with appropriately controlled conservation translocation of captive bred African Penguins appears relatively low and is not significantly increased from that of using wild bred African Penguins.

The scale of risk is much lower if conservation translocations are either reinforcements or reintroductions (population restoration into indigenous range). If conservation introduction is considered as a strategy for the conservation of the African Penguin (ecological replacement or assisted colonisation outside of indigenous range) then the scale of risk is significantly increased and additional risk assessment is required.

Table 1.
Assessment of risks associated with the conservation translocation of captive bred African Penguins

[1]IUCN Risk category	Hazards	Control Measures (which should be implemented in order to reduce the likelihood and/or severity of hazards)	Likelihood (with control measures applied) 1= Low 2= Medium 3= High	Severity (with control measures applied) 1= Low 2= Moderate 3= Severe	Risk Score (likelihood x severity) 1-3= Low 4-6= Medium 7-9= High
Risk to source populations	• Removal of individuals for release is unsustainable and jeopardises the long-term viability of captive populations.	• Penguins should be provided from captive populations which are demographically managed with separate targets set for sustainability and 'harvesting' for release.	1	1	**1 (Low)**
	• *(For healthy wild origin individuals – risk of removal excessively reducing viability of the colonies from which penguins are removed.)*	• *(If healthy wild penguins are removed from colonies then a viability analysis should be conducted beforehand to ensure that the removal does not impact colony viability, or if so then this is offset by predicted increase in viability resulting from the translocation.)*	*2*	*2*	***4 (Medium)***
	• *(For health challenged wild origin individuals removed for rehabilitation – risk of removal excessively reducing viability of the colonies from which penguins are removed.)*	• *(If health challenged wild penguins are removed from colonies then protocols should be put in place to ensure that the survival & reproduction of healthy adjacent conspecifics is not jeopardised by the removal process.)*	*1*	*2*	***2 (Low)***

[1] From the IUCN SSC Guidelines for reintroductions and other conservation translocations (2013)

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Ecological Risk	• Risk of penguins disrupting ecological processes and food webs.	• Translocation into indigenous range is recommended; conservation introduction carries an increased scale of risk and should be additionally risk assessed – (*this is equally applicable to wild translocated penguins*)	1	2	**2 (Low)**
	• Risk of penguins disrupting inter-specific level interactions; competition, predation etc.	• Translocation into indigenous range is recommended; conservation introduction carries an increased scale of risk and should be additionally risk assessed – (*this is equally applicable to wild translocated penguins*)	1	2	**2 (Low)**
	• Risk of penguins disrupting intra-specific interactions negatively affecting existing populations.	• Site selection criteria for reinforcement release sites should appraise resource availability in relation to existing penguin populations and utilisation – (*this is equally applicable to wild translocated penguins*)	2	1	**2 (Low)**
Disease Risk	• Introduction of novel pathogens into conspecifics having a negative effect on existing populations if translocation is reinforcement.	• Existing pre-release health screening protocols should be applied to captive bred individuals. Particular attention should be paid to Avian Malaria strains - (*this is equally applicable to wild translocated penguins held for extended periods ex situ*). • Captive populations should be subject to regular (at least annual) routine health screening.	1	3	**3 (Low)**

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	• Increased mortality of released penguins if they are exposed to pathogens unfamiliar to them.	• If penguins are imported from sources outside of South Africa or Namibia for release they should be subject to additional risk assessment due to the increased scale of risk. • Existing pre-release health screening & quarantining protocols should be applied to captive bred individuals. Particular attention should be paid to; techniques for acquiring immunity prior to release, and Avian Malaria strains - (*this is equally applicable to wild translocated penguins, sourced as eggs*)	2	1	**2 (Low)**
Associated invasion Risk	• Penguins displacing other marine species and becoming invasive • Accidental introduction of coincidental invasive organisms with penguins as part of their conservation translocation	• Risk of invasiveness is highly unlikely; translocation into indigenous range is recommended - (*this is equally applicable to wild translocated penguins*) • Current biosecurity protocols for wild translocated individuals should be applied to captive bred individuals. Maintain captive populations within South Africa and/or Namibia and apply additional risk assessment to imported penguins which carry an increased scale of risk - (*this is equally applicable to wild translocated penguins held for extended periods ex situ*).	1 1	1 3	**1 (Low)** **3 (Low)**

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Genetic Risk	• If a population restoration then intra-specific hybridisation reduces vigour or reproductive success in the existing population.	• There is no evidence of genetically distinct isolated populations within the African Penguin. • Penguins released should be from genetically managed populations with a broad founder base, operating within a recognised studbook and in which there is no evidence of hybridisation with other non-indigenous penguin species.	1	2	2 **(Low)**
Socio-economic Risk	• Translocated penguins negatively affect peoples and livelihoods.	• Unlikely for reinforcements. Site selection criteria for reintroduction release sites (or establishment of new breeding colonies) must appraise resources of human concern (e.g. commercial fishing stocks). (Establishing new mainland colonies may positively affect livelihoods by increasing ecotourism opportunities)– (*this is equally applicable to wild translocated penguins*).	1	2	2 **(Low)**
Financial Risk	• Translocated penguins cause damage to property and or livelihoods that require significant remedial funding.	• Risk of substantial damages is highly unlikely; translocation into indigenous range is recommended - (*this is equally applicable to wild translocated penguins*)	1	1	1 **(Low)**