



Application to amend the *List of Specimens taken to be Suitable for Live Import*
(Live Import List)

Application for the Import of
Fiordland Crested Penguin *Eudyptes pachyrhynchus*

Terms of Reference

1. Provide information on the taxonomy of the species.

Family	Spheniscidae
Species	<i>Eudyptes pachyrhynchus</i> (Gray 1845) . Monotypic ¹ No subspecies recognised.
Common Name	Fiordland Crested Penguin

Taronga Conservation Society Australia is requesting that the Fiordland Crested Penguin *Eudyptes pachyrhynchus* be added to the 'List of Specimens Suitable for Live Import' for the purposes of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), at species level.

2. Provide information on the status of the species :

CITES Listing:	Not listed on Appendix I, II or III ²
IUCN Red list status:	Vulnerable (VU A2be+3bce+4bce; C1+2a(i)) ³

In New Zealand it is classified as threatened based upon its low population size (C.5000 -6000 adults) and suspected ongoing population decline.⁴

3. Provide information about the ecology of the species. Include, but do not restrict your response to:

- Lifespan - no wild lifespan data was able to be sourced. Zoo records indicate 16 years (Taronga Zoo).
- Size and weight range : 55-71 cm , males weigh up to 4 kg,⁵ females, up to 3.4 kg
- Range : endemic to New Zealand and its surrounding islands, occurring in cool temperate waters. They are assumed to be pelagic outside the breeding season.

Normal non-breeding range includes coastal areas of south from Bay of Islands and Auckland ,

¹ del Hoyo, J., Elliott, A. & Sargatal, J. Eds 1992

² www.cites.org

³ <www.iucnredlist.org>. Downloaded on 26 November 2015.

⁴ Miskelly et al. 2008

⁵ Marchant and Higgins 1990



Distribution (Marchant & Higgins 1990)

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and coastal areas of South Island and Stewart Island. Outside the breeding season moulting immatures and adults disperse widely and have been recorded regularly on beaches of south eastern Australia, mostly Victoria and Tasmania.⁶

Breeding range extends along coastlines of South Westland to Fiordland and Stewart Island⁷. Birds arrive at nest sites in mid June and most chicks are fledged by mid to late November.

- **Habitat**

Fiordland Crested Penguins are a marine seabird. In the breeding season they nest on the ground in diverse coastal environments, including under dense forest or scrub and, typically on steep lower slopes of promontories scattered with boulders and rocks⁸.

- **Diet**

There is limited dietary information available - they are opportunistic feeders that take mostly small cephalopods or fish, also euphausiids and other small crustaceans⁹. Captures prey by pursuit diving¹⁰. Diet is variable with locality.

- **Social behaviour**

Fiordland Crested Penguins occur in loose congregations or single pairs on breeding grounds. Loose congregations, pairs or solitary during moult. Social behaviour at sea is little known: they've been recorded in groups and also as solitary birds¹¹.

⁶ Marchant & Higgins 1990

⁷ <http://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/penguins/fiordland-crested-penguin-tawaki/> Accessed 25 November 2015

⁸ Ibid

⁹ Van Heezik, Y.M. 1989

¹⁰ <http://www.nzbirdsonline.org.nz/species/fiordland-crested-penguin> Accessed 25 November 2015

- **Territorial and aggressive behaviours**

They defend individual distances and nest sites by jabbing with bill and various calls. Birds attack by physically charging and using bill¹².

- **Natural predators**

Human activity destroys nest sites, birds (Weka *Gallirallus australis*) and introduced mammalian predators (dogs, stoats, rats) prey on birds and eggs¹³. Fiordland Crested Penguins are also impacted by commercial fishing activities which compete for foods^{14, 15}. 'Marine perturbations can cause substantial changes in prey abundance, and a future rise in sea temperatures could have a similar effect'¹⁶.

- **Characteristics that may cause harm.**

There are no characteristics that have been recorded as to suggest causing harm to humans.

4. Reproductive biology

- **The age at maturity (first breeding)** : Understood to be around 5-6 years of age¹⁷.
- **Breeding information** : Fiordland Crested Penguins are monogamous. Breeding is seasonal – commencing in winter to achieve spring hatching and two eggs are usually laid, with one chick typically raised¹⁸.

No case of hybridisation has been recorded. Some taxonomists consider that *E. pachyrhynchus* forms a super species with *E. scalteri* and *E. robustus*; these two latter species have been considered races of present species¹⁹. The first record of interbreeding between the two latter species in the wild was reported in 2014 (-the nest site /clutch failed)²⁰. Fiordland Crested Penguins are considered to be reproductively isolated because of their low-altitude breeding sites and timing of breeding²¹.

5. Provide information on whether this species has established feral populations.

Birdlife Australia Atlas records that there have been 33 sightings of this species recorded on the Australian coast since 1999²². There are no records of breeding populations of Fiordland Crested Penguins having been established outside of New Zealand waters.

6. Provide information on, and the results of any other environmental risk assessments undertaken on the species both in Australia and overseas.

¹¹ <http://www.nzbirdsonline.org.nz/species/fiordland-crested-penguin> Accessed 23 November 2015

¹² Ibid

¹³ Ibid

¹⁴ Ellis *et al.* 1998

¹⁵ Ibid

¹⁶ <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3854> Accessed 25 November 2015

¹⁷ Ibid

¹⁸ Ibid

¹⁹ del Hoyo, J., Elliott, A. & Sargatal, J. Eds 1992,

²⁰ Morrison, K, & Sagar, P., *Notornis* 61: 109-112, 2014

²¹ Ibid

²² www.birdlife.org.au/projects/atlas-and-birddata Accessed 5 January 2016

This pelagic species does occur in Australian waters, and has been successfully maintained at Taronga Zoo for 20 years without manifestation of any pest or disease threat issue.

No import Risk Analysis has been undertaken specifically for Fiordland Crested Penguins by Biosecurity Australia. Biosecurity Australia has previously provided recommendations to AQIS on importation of King and Gentoo Penguins from New Zealand²³.

<https://www.google.com.au/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=terms+of+reference+ofr+King+penguin+import>

7. Assess the likelihood that the species could establish a breeding population in the Australian environment should it ever be released from effective human control.

Records²⁴ indicate that individual Fiordland Crested Penguins arrive as vagrants on Australian coasts, mostly Tasmania and Victoria on an irregular basis. Some birds are brought into rehabilitation and then released, however the outcome of the releases is not monitored. Similar latitudinal environmental conditions between New Zealand and Australian would suggest opportunity for colonisation however this has not been observed /recorded ; yearly sea temperatures off southern NZ (10.6 -15 °C) provide some range of overlap with those off Tasmanian (13 -18°C) and Victorian coasts (14.6 - 18.8°C)²⁵. Absence of Australian records of breeding suggests that conditions in the Australian environment may not be suitable for establishment or success.

As previously noted in this application Fiordland Crested Penguins on land are at risk to predation by dogs and cats. These predators are a recognised threatening process to Australia's Little Penguin (*Eudyptula minor*) colonies and therefore this threat capacity would apply equally to any Fiordland Crested Penguins.

With a single chick usually reared, their potential reproductive rate is very low.

As opportunistic feeders, it would be fair to assume capability to find food sources.

Fiordland Crested Penguins have been held in Australian zoological institutions for 20 years. These animals have all been acquired locally through public donation. In considering accidental release from a zoo, typically animals born and/or nurtured in zoos are not imminently suitable for "hard release" to the wild. That is, where released without any level of initial food supplementation, pre-release conditioning and training to develop fitness, recognise appropriate food sources and predator awareness training.

8. Provide a comprehensive assessment of the potential impact of the species should it establish feral population/s in Australia.

The only similar niche species in Australia is the Little Penguin (*Eudyptula minor*), a species which also occurs widely along the New Zealand coast and breeds sympatrically with Fiordland Crested Penguins²⁶.

²³ Biosecurity Australia (2008) *Policy review of the biosecurity risks associated with the importation of penguins from New Zealand*. Biosecurity Australia, Canberra, Australia.

²⁴ www.birdlife.org.au/projects/atlas-and-birdata Accessed 5 January 2016

²⁵ www.seatemperature.org Accessed 25 November 2015

²⁶ www.nzbirdsonline.org.nz Accessed 25 November 2015

A study in the wild where 3 penguin genera breed (Yellow-eyed, Fiordland and Little) recorded that Fiordlands (FCP) and Little Penguins ate juvenile forms of fish and squid but FCPs consumed mainly 'Ahuru' *Auchenoceros punctatus*, while Little Penguins took mainly squid (*Notodarus sloanii* and *Moroteuthopsis ingens*²⁷, and it could be surmised that dietary competition could result from interspecies competition when food supplies are low.²⁸

Limited information is available concerning the natural health profile of the species and there is little information on endemic disease, so the risks from potentially exotic diseases are therefore largely unknown. A novel blood parasite, *Leucocytozoon tawaki*, has been described from wild Fiordland Crested Penguins and is not considered pathogenic²⁹. As noted earlier, various Australian state wildlife authorities release rehabilitated Fiordland Crested Penguins from their coasts.

On reflection of the above issues the impact of a feral population would likely remain highly localised, and anticipate that it would not thrive for long; in particular where sea conditions do not overlap with natural range. In addition, the slow breeding rate and the eventual need for additional animals for genetic input presents an unlikely case for feral establishment.

9. What conditions or restrictions, if any, could be applied to the import of the species to reduce any potential for negative environmental impacts:

Taronga seeks to import a single individual Fiordland Crested Penguin as a one off event. The current application relates to an injured bird that required care for over a year and under New Zealand rules cannot be kept in captivity long term in that country. In saying that, if in the future colleagues in New Zealand seek support for this species through further importation Taronga would actively support these efforts. Taronga does seek to establish a breeding situation if the opportunity arises in the future. Taronga is currently the only ZAA institution listing for the species.

Taronga Conservation Society Australia seeks to import Fiordland Crested Penguin to support their Great Southern Oceans themed present, through the display and interpretation of this species. In Taronga has a proven record for penguin care, with Fiordland Crested Penguins achieving 15 year life spans. It also co-ordinates the regional breeding program for Little Penguins where it has bred over 300 birds³⁰.

Additional restrictions to negate feral population establishment will be by way of the continuation of the secure containment provided by the members of the Zoo and Aquarium Association. Adherence of members to Association policies and statutory regulations has negated the establishment of any feral population for more than 20 years. Containment within enclosures and within the zoo as a whole is proven and enforced by relevant legislation.

10. Provide a summary of the types of activities that the specimen may be used for if imported into Australia (e.g. pet, commercial, scientific).

The Fiordland Crested Penguin plays a key role as a flagship species for our region's marine and coastal habitats. Large and vocal, the species is well suited to act as an ambassador for the

²⁷ Van Heezik 1989

²⁸ Croxall et al 1994

²⁹ Duignan, P. Diseases of Penguin, Surveillance 28(4) 2001, from www.SciQuest.org.nz Accessed 25 November 2015

³⁰ 2015 ISIS International Species Information System (ZIMS)

protection of marine species and their environments. Through display with a range of marine mammal and penguin populations the Fiordland Crested Penguin, is used to showcase the connectedness of the marine environment and also how human actions in this realm and on the coast can have a significant impact. Management of the species also enables development of positive indices of animal welfare.

The proposal to transfer this bird to the Taronga collection to fulfil a role of conservation education and advocacy has been formally supported by the Tangata whenua, the indigenous people, of the area from which this bird originated in New Zealand.

11. Provide detailed guidelines on the way in which the species should be kept, transported and disposed of in accordance with the types of activity that the species may be used for if imported into Australia.

The current planned import is for a non-breeding individual that under current New Zealand rules cannot be held in captivity. The bird in question was found as a fledged chick with injuries causing it to be taken into care where it has resided for over a year. Due to the nature of the injuries the bird received veterinary advice suggests the bird will not produce fertile eggs.

Husbandry and transport protocols, including the secure containment of this species have been well established, noting that Fiordland Crested Penguins have been in zoological care for 20 years. The notable life spans achieved for several birds, demonstrates competency in husbandry and veterinary care for this species.

As a member of the Zoo Aquarium Association Taronga is required to uphold the Association's *Code of Ethics* and *Code of Practice*, which includes documentation and drills for emergency animal escape procedures. The Association's *Code of Ethics* requires the demonstration of professional standards of animal husbandry and animal welfare. The Association's Accreditation Program, upon which membership is contingent, requires institutions to recognise that the physical, psychological and physiological states of their animals must promote positive animal welfare.

Effective disease management will be achieved by housing Fiordland Crested Penguins destined for import to Australia in compliance with any quarantine and veterinary procedures required by Biosecurity Australia during pre-export isolation and post arrival quarantine.

The protocols for caring for Fiordland Crested Penguins have been built on experience of caring for this species and from protocols developed for Little Penguins³¹ at Taronga Zoo. There is a specific document covering housing requirements, as well as a Veterinary Nutritionist approved diet³². These two documents provide details on the correct husbandry practices for keeping penguins including housing and environmental requirements, breeding management, routine veterinary treatments and checks, capture, restraint and transportation and notes on effective containment.

Capture, restraint and transportation

³¹ Bombonato & Wright, 2012 (Taronga Zoo)

³² Bombonato 2012 (Taronga Zoo)

Penguins are best caught in cool weather so they do not overheat and they should not be handled or transported after being fed.

Capture can be done by hand or small net. Gloves are not to be worn when handling penguins as it is difficult to feel the amount of pressure placed on the birds. When capturing the penguin place one hand over the back of the neck, be firm but gentle and place the other hand under the penguin's abdominal area. Do not lift the bird by the neck as this may injure the bird's neck.

If the penguin is being restrained for veterinary purposes it is preferable to cover their eyes while inspecting other parts of the body to reduce stress.

Health Checks, Weighing and Measuring

Every six months parasite checks are carried out and there is a yearly health check-up which involves weighing, checking of feet, eyes, beak and cloacae. Regular inspection of faecal matter is undertaken.

Transport Equipment

Wooden transport crates with mesh top and upper panels are used for long distance. Within zoo boundaries a plastic carry crate (pet pack) is used.

Transport by air is undertaken in containers consistent with requirement 22 of the International Air Transport Association (IATA) live animal regulations (IATA 2013) and under permit requirements issued by Department of the Environment, and Biosecurity Australia (Department of Agriculture) to Australia. Following air transport birds are transferred by road to secure enclosures at nominated Association member zoos.

Containment

Australian States have respective regulatory agencies that oversee codes of practices with requirements for safe and secure housing for animals on public exhibition:

- NSW - General Standards for Exhibiting Animals Part 5 – 'enclosures ..must be constructed of such materials and be maintained in sufficiently good repair so as to ensure that they will contain the animals at all times and are safe for the animals; an animal cannot escape except in circumstances that cannot reasonably be foreseen and guarded against';
- Queensland – 'enclosures must be maintained in sufficiently good repair so to ensure that they will contain the animals at all times and are safe for the animals'.
- Victorian Code of Practice for public display of exhibition of animals – 'enclosures must be constructed and designed to minimise risk of animal escape'.

In addition, membership of the Zoo and Aquarium Association is contingent on meeting professional standards of animal care, including the safe and secure containment of animals, which is validated through the Accreditation process.

Surplus specimen numbers would be regulated by the implementation of controlled regional breeding programs established by the Zoo and Aquarium Association and facilitated by the species coordinator for this species. Surplus animals would be avoided by separation of sexes or desexing where necessary. If necessary, disposal options for surplus animals could include euthanasia in accordance with institutional ethical euthanasia policies and procedures.

12. Provide information on all other Commonwealth, state and territory legislative controls on the species.

There are no Australian Government regulations relating specifically to Fiordland Crested Penguins.

As noted, Biosecurity Australia has a penguin importation policy document that can be accessed by copying this link into your internet browser -

http://www.agriculture.gov.au/SiteCollectionDocuments/ba/memos/2008/2008_01a.pdf

Provisions of the *Quarantine Act 1908* and the *Quarantine Proclamation Act 1988* as amended should also be considered when reviewing the potential import of this species.

The species has been held in Victoria, New South Wales, Tasmania and South Australia, and the movement of the Fiordland Crested Penguin is controlled by permit in each respective Australian State.

REFERENCES

BIRDLIFE INTERNATIONAL (2016) Species factsheet: *Eudyptes pachyrhynchus*. Downloaded from <http://www.birdlife.org> on 05/01/2016.

CROXALL P., REID K., PRINCE P.A, 1999, Diet, provisioning and productivity responses of marine predators to differences in availability of Antarctic krill. *Marine Ecology, Progress series*, vol 177 pp 115-131.

BOMBONATO E. 2012, Little Penguin Husbandry Manual ,Taronga Conservation Society Australia

BOMBONATO E, & WRIGHT L., 2012, Guidelines for Housing Fiordland Crested Penguins, Taronga Conservation Society Australia.

DEL HOYO J., ELLIOTT, A. SARGATAL J., *Eds* 1992, Handbook of Birds of the World, ,Vol 1. Lynx Eds.

DUIGNAN P. J., Diseases of Penguins, *Surveillance* 28(4) 2001 pp5-11.

ELLIS S.,CROXALL, J. P.; COOPER, J. 1998. Penguin conservation assessment and management plan: report from the workshop held 8-9 September 1996, Cape Town, South Africa. IUCN/SSC, Apple Valley, USA.

FALLIS A.M., BISSET , S.A., ALLISON ,F.R. *Leukocytozoon tawaki* (n.sp.) (Eucoccidia:Leucocytozoidae) from the penguin *Eudyptes pachyrhynchus*, and preliminary observations on its development in *Austrosimulium* spp. (Diptera: Simuliidae), *New Zealand Journal of Zoology* 3, 11-6, 1976.

MARCHANT, S. & HIGGINS, P.J. , 1990. Handbook of Australian and New Zealand & Antarctic Birds, Vol 1 pp195-205. Melbourne: Oxford University Press.

MISKELLY C.M., DOWDING J.E., ELLIOTT G.P., HITCHMOUGH R.A., POWLESLAND R.G., ROBERTSON H.A., SAGAR P.M., SCOFIELD R.P., TAYLOR G.A, 2008. Conservation status of New Zealand birds, 2008. *Notornis* 55: 117–135.

MORRISON K., & SAGAR P., 2014, First record of interbreeding between a Snares crested (*Eudyptes robustus*) and erect-crested penguin (*E. sclateri*)' *Notornis* 61: 109-112 .

VAN HEEZIK, Y.M. 1989. Diet of the Fiordland Crested Penguin during the post-guard phase of chick growth. *Notornis* 36: 151–156.

VAN HEEZIK, Y. 1990. Seasonal, geographical, and age related variations in the diet of the Yellow-eyed Penguin (*Megadyptes antipodes*). *N. Z. J. Zool.* 17: 201–212.

VAN HEEZIK, Y. & DAVIS, L. 1990. Effects of food variability on growth rates, fledging sizes and reproductive success in the Yellow-eyed Penguin *Megadyptes antipodes*. *Ibis* 132: 354–365.