SINGLE SPECIES ACTION PLAN FOR THE CONSERVATION OF THE CHRISTMAS ISLAND FRIGATEBIRD (*Fregata andrewsi*)

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Executive summary

The Christmas Island Frigatebird is a threatened migratory seabird because it has a small population which breeds within a tiny area of occupancy on just one island, and which is continuing to decline. The species was included in Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) at its 12th meeting of the Conference of the Parties (COP) in 2017.

This Action Plan has been prepared by the Government of Australia for consultation with Range States for the Christmas Island Frigatebird. The Action Plan identifies key threats and prioritises actions required to improve the conservation status of the Christmas Island Frigatebird throughout its range. It is proposed that the Action Plan is submitted to CMS COP14 for adoption with a view to promote immediate implementation.

1. Introduction

Christmas Island Frigatebirds breed only on Christmas Island in the Indian Ocean (10°25′18″S 105°40′41″E). They are colonial nesters that utilise a few small patches of forest in the northeast of the island (James and McAllan 2014; Commonwealth of Australia 2020).

Typical of frigatebirds, hatching to independence takes at least 15 months. Courtship and nestbuilding activities peak in March, egg-laying peaks in April, with hatching mostly in May–June. Juveniles begin to fly in September–October but remain dependent on parental provisioning and stay close to nest-trees, often until April or May of the following year. When young leave the breeding colony, they remain dependent on parental provisioning for a further period of time, although very little is known about the location and the duration of this transition to independence. Other frigatebirds return to the natal colony to breed at 6 years of age, and Christmas Island Frigatebirds are assumed to do the same (Bird et al. 2020).

Male Christmas Island Frigatebirds share parental duties equally with females during incubation, however, a few months after the chick hatches the males reduce and eventually cease their involvement in chick rearing, leaving the female, which is up to 28% heavier than male, to provision the chick until it becomes independent.

The extended chick-rearing period of Christmas Island Frigatebirds means that, while some birds are laying eggs, there are other parts of the breeding population engaged in chick-rearing (James 2003). The duration of chick-rearing and discrepancy in duties between males and females suggest that females may only breed at two-year intervals if successful, but males may breed annually, as has been suggested for Magnificent Frigatebirds *Fregata magnificens* which have a similar sex-specific difference in parental roles (Diamond 1972). To date, however, there have been no mark-recapture studies of Christmas Island Frigatebirds.

2. Biological assessment

2.1 Taxonomy

Class Aves
Order: Suliformes
Family: Fregatidae
Genus: Fregata
Species: Recognised as *Fregata andrewsi* by Birdlife International (BirdLife International

2022)

Taxonomic uniqueness: very high; species/genus: 5, genera/family: 1, families/order: 4.
The Christmas Island Frigatebird is monotypic with no recognised subspecies. The species name *Fregata andrewsi* honours the English palaeontologist Charles Andrews who conducted a natural history inspection of Christmas Island prior to the commencement of phosphate mining in 1897 (Andrews 1900).

Common name(s) in languages of CMS and relevant range states (https://avibase.bsc-eoc.org/species.jsp?avibaseid=67200E8E10682E29)

Chinese: 白腹军舰鸟
Chinese (Traditional): 聖誕島軍艦鳥
English: Christmas Island Frigatebird, Andrews' Frigatebird, Christmas Frigatebird
French: Frégate d'Andrews
Indonesian: burung fregat pulau natal, Bintayung Pulau Christmas, Burung Ciakalang Bintayung, Burung Cikalang Bintayung, Burung Cikalang Christmas, Cikalang Christmas, Burung Angin
Japanese: シロハラグンカンドリ
Malay: Burung Bintayung, Burung Simbang Pulau Christmas, Simbang Pulau Christmas
Spanish: Rabihorcado de la Christmas
Thai: นกโจรสลัดเกาะคริสต์มาส
Vietnamese: Chim Cốc biển bụng trắng, Cốc biển bụng trắng

2.2 Distribution and movement

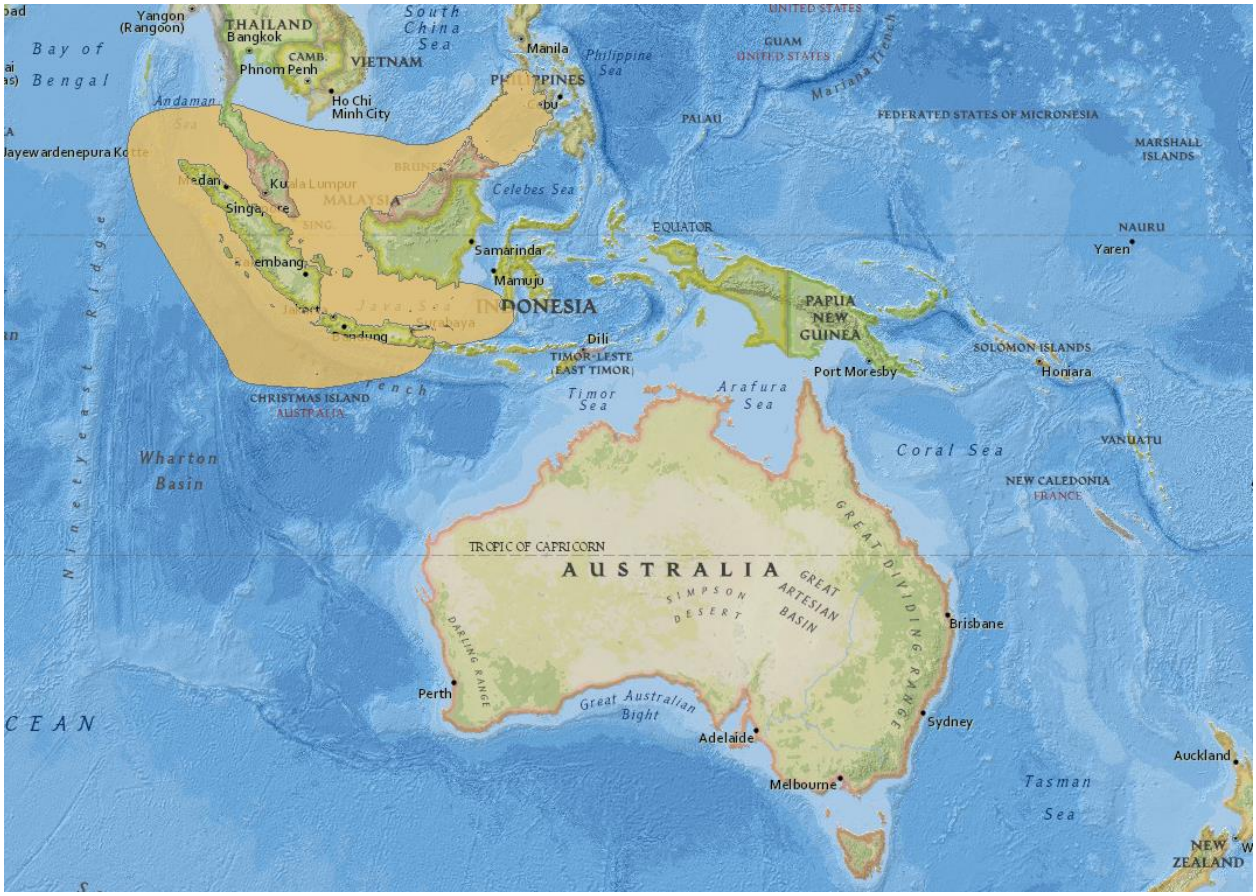

Figure 1. Distribution of the Christmas Island Frigatebird

2.2.1 Breeding season

Christmas Island Frigatebirds nest in the canopy of tall trees in the coastal terraces on the northeast corner of Christmas Island (Figure 1). During the breeding season they forage entirely at-sea, including throughout the Christmas Island Marine Park that was established in 2022 (https://parksaustralia.gov.au/marine/parks/indian-ocean-territories/christmas-island/) (See Figure 1). Satellite tracking of male and female Christmas Island Frigatebirds during the chick-rearing period showed that females foraged predominantly to the south of the island whereas males foraged further afield, typically to the north of Christmas Island around the Indo-Malay Archipelago (Hennicke et al. 2015). As chick-rearing progressed, satellite-tracked males made progressively longer foraging trips until they ceased provisioning the chick after it reached 2-3 months of age. The duration and distance from the colony of foraging trips by females increased with the age of the chick and followed the same geographic distribution as those of the male birds with individuals moving progressively to the north of Christmas Island towards Java and Sumatra.

2.2.2 Non-breeding season

When birds are not constrained to return to Christmas Island to feed a chick, tracked birds have dispersed across the area of the Indo-Malay Archipelago over the Sunda Shelf to South China Sea, Andaman Sea, Gulf of Thailand, Sulu Sea, off the coast of south-west Sulawesi and the Philippines (Jensen et al. 2010, 2015; James and McAllan 2014; Hennicke et al. 2015; Tirtaningtyas and Hennicke 2015) (see Figure 1). The seas around West Java, Indonesia seem to be particularly important during the non-breeding season, especially in Jakarta Bay, including Pulau Rambut Wildlife Reserve where 209 individuals were seen in July 2012 (cited in Tirtaningtyas & Yordan 2017). The distribution and status in the Indian Ocean to the south and west of Christmas Island is generally less well known but one individual was recorded off the coast of Kanyakumari district, southern India in 2014 (Arivanantham 2014). Records from mainland India, as well as in northern Australia, Thailand and Viet Nam (Conlin 2013, McMaster et al. 2015, Vromant and Chau 2007) are thought to be extra-limital but may be more frequent than appreciated given that similarities with other frigatebirds may mean occurrence of the Christmas Island Frigatebird may often be overlooked.

2.3 Habitat requirements

2.3.1 Breeding habitat

Nesting colonies predominantly occur in forests on shore terraces that are protected from the prevailing south-east trade winds (Hill and Dunn 2004; James and McAllan 2014). It is thought that forest vegetation between nesting trees and the coast provides protection from the wind (James 2003). Hill and Dunn (2004) noted that increased wind turbulence around nesting trees, arising from vegetation clearing, is a cause for concern and clearance of vegetation within 300m of nesting should be considered undesirable (Commonwealth of Australia 2020).

There are three main extant nesting colonies of Christmas Island Frigatebirds: ‘Golf Course’ on the eastern coast, and ‘Chinese Cemetery’ and ‘Margaret Beaches’ on the northern coast; historically, there were nesting colonies at the Dryers, Flying Fish Cove and Ethel/Lily Beaches that today (Clarke et al. 2022) are greatly reduced or no longer occupied (see Figure 2).

In 2021 the Chinese Cemetery and Golf Course colonies were the main active colonies with an estimated 669 active Christmas Island Frigatebird nests (i.e., breeding pairs) present on the island (Clarke et al. 2022). Margaret Beaches was also considered likely to be a nesting colony although this was not thoroughly surveyed given inaccessible terrain (Clarke et al. 2022).

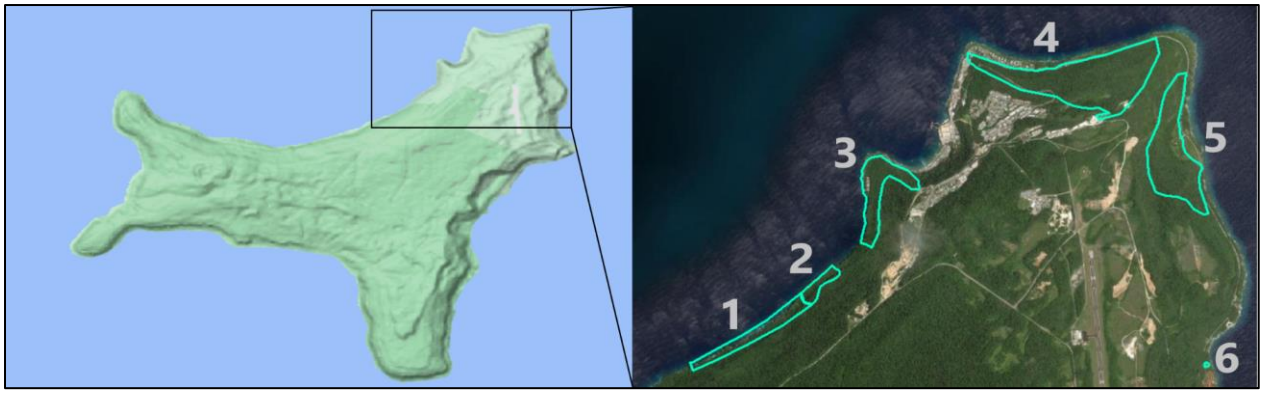

Figure 2. Location of all recent historical (e.g. 1980-2020) Christmas Island Frigatebird colonies on Christmas Island (outlined in green on right panel). The island consists of an inland plateau with terraces leading down to the coast (topography shown on left panel), with nesting colonies occupying dense tropical forest on the first and second terraces. Colonies locations: 1 (Margaret Beaches), 2 (Dryers), 3 (Flying Fish Cove), 4 (Chinese Cemetery), 5 (Golf Course) and 6 (Ethel/Lily Beach). Figure from Clarke et al. (2022).

The stick nests are typically built in the tree canopy, with 65% of all nests found in the tall forest of sea almond *Terminalia catappa* and stinking wood *Celtis timorensis,* and with up to 40 nests in a single tree (Hill and Dunn 2004).

2.3.2 Non-breeding habitat

Hennicke et al. (2015) reported that during the non-breeding period female birds made foraging trips from roost sites in the South China Sea and the Java Sea during daylight hours only and remained faithful to particular roosting sites for up to 2–5 months. James and McAllan (2014) noted that flocks of more than 500 Christmas Island Frigatebirds have been reported at some of the 13 roost-islands in the Java, South China, Sulu and Andaman Seas, and suggested that these sites are important in providing frigatebirds with access to good foraging areas away from the breeding colonies. In Jakarta Bay, the Christmas Island Frigatebird has been observed using the Java Olive tree (*Sterculia foetida*) and mangroves in Pulau Rambut Nature Reserve for roosting.

2.4 Important Sites

The most important single site for Christmas Island Frigatebirds is Christmas Island as it is the species' only breeding location. There are no historical records of it breeding at any other locations. Away from Christmas Island, the area of the Sunda Shelf seas, especially Jakarta Bay, appear to be important areas for non-breeding birds.

2.5 Foraging behaviour and diet

Christmas Island Frigatebirds feed predominantly by picking items from the sea surface while on the wing. In oceanic areas this means that they are largely dependent on subsurface predators, such as tuna, to drive live prey to the surface. The main live-prey elements of the diet include flying fish *Exocoetidae* and squid (Gibson-Hill 1947), however, there are no comprehensive studies of their diet. They are also generalist scavengers and kleptoparasites, feeding on prey disgorged by other birds as a result of the pursuit by frigatebirds. They have been recorded successfully pursuing a range of seabirds such as boobies *Sula* spp, noddies *Anous* spp and tropicbirds *Phaethon* spp (B. Baker unpublished), as well as other species including grey heron *Ardea cinerea*, Black-crowned Night Heron *Nycticorax nycticorax*, Oriental Darter *Anhinga melanogaster*, Little Egret *Egretta garzetta*, and Cattle Egret *Bubulcus ibis* (Tirtaningtyas and Yordan 2017).

2.6 Population size and trend

The earliest population estimates suggest that there may have been up to 6300 pairs of Christmas Island Frigatebirds breeding annually but this had declined to 4500 pairs by 1910, 3500 by 1945, 2500 by 1967 and 1500 by 1978 (James 2003).

Historically there were large colonies on the north coast at Flying Fish Cove and the 'Dryers' site which is adjacent to a phosphate mine (James and McAllan 2014). Starting in the 1970s, large emissions of phosphate dust impacted the 'Dryers' site and the number of nests declined through the 1980s and 1990s (Stokes 1988), with no nests recorded at the 'Dryers' site in 2003 (James 2003, Hill and Dunn 2004). It has been suggested that some birds may have moved from the 'Dryers' colony may to form the 'Cemetery' colony (Stokes 1988).
There have been six estimates of breeding population size in the last three generations:
1985: 1300 pairs (Golf Course 850 nests, Cemetery 350, Dryers 100 (Stokes 1988),
2003: 1466 ± 325 (James 2014),
2004: 1392 ± 102 (James 2014),
2016: 1050 (JC Hennicke unpublished).
2017: 1200 (JC Hennicke unpublished).
2021: 669 (Clarke et al. 2022).

All figures are for the number of nests with eggs in the specified breeding seasons, but since frigatebirds have a complex biennial breeding cycle, the actual number of adult birds in the population is higher than the single year figure but lower than the sum of two consecutive years (James 2014). Morris-Pocock et al. (2012) estimated the total population to be 5000 individuals based on the mean of a genetic estimate of population size using samples collected from 2007 to 2010. Garnett et al. (2011) estimated the total population to have comprised 4800 mature individuals in 2010, based on an estimate of 1200 pairs breeding annually and accounting for biennial breeding (Beeton et al. 2010). Macgregor et al. (2021) estimated the population at 3700 mature individuals, based on the mean of the genetic estimate and the absolute minimum of 2400 from 2017.

Clarke et al. (2022) conducted repeat surveys of Christmas Island Frigatebirds in May and June 2021 in which they evaluated the use of remotely piloted aircraft (drones) to count nesting frigatebirds from the air, building on earlier work undertaken at Pulu Keeling (Clarke et al. 2021). They concluded that the use of remotely piloted aircraft provides a minimally invasive, repeatable and potentially valuable tool for surveying tree-nesting tropical seabirds. The results from the 2021 surveys indicate a much lower population size than previous surveys, suggesting that repeat aerial surveys should be undertaken to provide a better understanding of the contemporary breeding population size.

Macgregor et al (2021) noted that there was evidence of a continuing population decline but that this had a low level of reliability. The logistical challenges of conducting accurate whole-island censuses, the difference in approaches taken to produce historical estimates, the natural variability in the portion of the adult population that are actively breeding in any year and the relatively long generation time assumed for the species (12.44 years, Bird et al 2020) make the interpretation of trend data and detection of declines very difficult. Furthermore, the low fecundity and high age of first breeding, which is correlated with the relatively long generation time, means that the population is likely to be slow to recover following declines even when drivers of historical and contemporary decreases are alleviated (Macgregor et al. 2021, Hill and Dunn 2004).

3. Threat assessment

3.1 Description of key threats

3.1.1 Breeding habitat loss

Historically, the loss of breeding habitat has been identified as the most obvious cause of decrease in the population of Christmas Island Frigatebird. In particular, suitable breeding habitat has been fragmented because of human settlement, and pollution from phosphate mining has caused the abandonment of some previously important colonies (Hill and Dunn 2004). Assuming that this is the major driver of any ongoing decline implies that suitable breeding habitat is a limiting factor and that birds have limited options to relocate or recolonise.

3.1.2 Terrestrial habitat degradation

Shore terrace nesting habitat for the Christmas Island Frigatebird is threatened by the spread of invasive vines such as the Coral Vine *Antigonon leptopus* and other weeds, which compete with the tall trees favoured for nesting. Weed control in areas where they may impact threatened species is a priority in the Christmas Island National Park Management Plan (Director of National Parks 2014). The habitat on islands used for roosting in Jakarta Bay is also threatened by invasive vines (Garnett and Woinarski 2018).

3.1.3 Disease

Quillfeldt et al. (2011) and Merino et al. (2012) found that Christmas Island Frigatebirds were infected with hemosporidian blood parasites that may impact the immune competence of infected birds. While the provenance of these infections is not clear, Beeton et al. (2010) noted that elements of Christmas Island's biodiversity have declined due to diseases, particularly associated with introduced species. Therefore, it is apparent that the introduction of a new disease could lead to further declines in native species, including the Christmas Island Frigatebird. At this stage, management of this aspect would not appear to be a high priority as there is no evidence of Christmas Island Frigatebirds being negatively impacted by diseases. Nevertheless, continued vigilance is an important action as the potential non-lethal impacts of a blood parasite may not have been detected by research to date.

3.1.4 Hunting and incidental take

Harvesting of frigatebirds for food on Christmas Island has probably had a severe impact on population size during the early days of settlement, however, this activity ceased in the late 1970s (Nelson 1972; Stokes 1985). Tirtaningtyas and Hennicke (2015) reported on the intentional capture, poisoning/sedating, and shooting of Christmas Island Frigatebirds in Jakarta Bay, from 2011 to 2013, where it seems that birds were intentionally captured to be eaten (see also https://www.youtube.com/watch?v=Us4QdrQPiDI).

3.1.5 Bycatch

Because the foraging behaviour of frigatebirds mainly involves seizing prey from the water's surface, they are not likely to be regularly caught in industrial fisheries (longline or net gear) as evidenced by many studies of seabird bycatch and threats e.g., Dias et al. (2019), Woehler and Baker (2020). In recent years Christmas Island Frigatebirds have been observed entangled in fishing lines and nets of local fisherman in Jakarta Bay, Indonesia (Tirtaningtyas and Hennicke 2015; Sedayu et al. 2020) but the level of this is impact has not been described.

3.1.6 Fisheries prey depletion (indirect effects of fishing)

When foraging in offshore areas frigatebirds are known to feed on fish prey driven to surface by schools of tuna, therefore the reduction in numbers of tuna in the Indian Ocean as a result of commercial fishing (Collette et al. 2011) is likely to reduce the frequency of these natural foraging opportunities. This in turn is likely to lead to reduced foraging success and/or greater dependence on foraging in association with tuna fishing vessels operating in the foraging areas of Christmas Island Frigatebirds bringing with it the increased risk of incidental mortality (Hennicke et al. 2015, Febrianto et al 2021) (but refer to section 3.1.5 above). Prey depletion is also likely to impact foraging of boobies and noddies, which could in turn indirectly impact through reduced amounts of prey disgorged by these birds as a result of Frigatebird pursuits.

3.1.7 Disturbance

Christmas Island Frigatebirds are sensitive to any disturbance at the nesting site that causes adults to leave the nest, as this creates an opportunity for egg or chick predation. Also, because they nest in trees, disturbance that causes chicks to fall from the nest will lead to starvation as they are unable to climb back into their nest and are not fed by their parents.

Frigatebirds spend a lot of time resting in roost sites and these periods of inactivity are important given their energetically expensive aerial-pursuit foraging behaviour. Therefore, disturbance at roosting sites increases their daily energy costs and is likely to impact the time available for foraging behaviour (Nelson 1975).

3.1.8 Marine debris and pollution

Christmas Island Frigatebirds have been observed entangled in fishing lines in Jakarta Bay, Indonesia (Tirtaningtyas and Hennicke 2015). However, it is unclear if this is a result of bycatch in an active fishing operation, intentional take (hunting) or entanglement in lost gear (see also 3.1.4 and 3.1.5 above).

Being surface feeders Christmas Island Frigatebirds are likely to be exposed to high risk of ingesting floating marine plastic that are mistaken for pieces of food. This risk is especially relevant during the non-breeding period as the Indonesia and Java Sea region is recognised globally as having some of the highest levels of marine plastic pollution (Vriend et al 2021, Purba et al. 2019).

Although there are no studies of plastic ingestion and other pollutants in Christmas Island Frigatebirds, a study at a breeding site in the Northwestern Hawaiian Islands found that Great Frigatebirds *Fregata minor* had plastic in 42% of stomachs sampled (Rapp et al. 2017). In a global analysis of plastic additives and persistent organic pollutants in the preen gland oil of seabirds, Yamashita et al. (2021) suggested that the higher concentrations of decabromo diphenyl ether, a brominated flame retardant and a known endocrine disrupter, found in preen gland oil of Great Frigatebirds, are probably derived from ingested plastics.

There is some limited evidence of cadmium exposure in the Christmas Island Flying-fox *Pteropus natalis* (Pulscher et al. 2021). This species, like the Christmas Island Frigatebird, historically occupied vegetation at the Dryers site, which was smothered by phosphate dust in the 1970s (James and McAllan 2014). Given the frigatebird has been exposed to cadmium through phosphate dust pollution in its breeding habitat there is a risk it was affected by cadmium poisoning in the past (Commonwealth of Australia 2020) and may continue to be so. Kidney damage and lung emphysema are the primary effects of high cadmium in the body (Nordic Council of Ministers 2003) but frigatebirds have not been tested or autopsied to assess the intensity of this risk.

Mott et al. (2017) investigated mercury pollution levels through the feather mercury concentrations of adult and juvenile Lesser Frigatebirds (*Fregata ariel*) and Great Frigatebirds breeding in the eastern Indian Ocean. Low mercury concentration in juveniles relative to adults, higher mercury concentration in adult females than adult males, and a trend for Lesser Frigatebirds to have higher mercury concentration than Great Frigatebirds implicated non-breeding ground exposure as the major influence on mercury burden. Mott et al. (2017) noted that aspects of the frigatebird foraging ecology were consistent with high exposure occurring in inshore waters of the non-breeding range, particularly in the South China Sea. Christmas Island Frigatebirds are also at risk of mercury pollution.

3.1.9 Climate change

The marine region around Christmas Island is typical of a tropical oceanic marine environment in which the primary productivity is relatively low and also decreases with increasing water temperature. As such, it may be expected that the productivity of this type of tropical marine systems may decline as a result of ocean warming (Bryndum-Buchholz et al. 2019) with consequential impacts on seabird foraging performance (Hennicke and Weimerskirch 2014). Changes in the frequency and intensity of tropical cyclones as a result of climate change (Knutson et al. 2020) may also increase the risk of damage to nesting sites.

3.2 Threat prioritization

The threats faced by Christmas Island Frigatebirds can be prioritised using a risk matrix that considers the likelihood of an incident occurring and the population level consequences of that incident. Threats may act differently at different locations and on different parts of the population at different times of year, but the precautionary principle dictates that the threat category is determined by the group at highest risk. Population-wide threats are generally considered to present a higher risk.

The risk matrix presented in Table 1 uses a qualitative assessment drawing on peer reviewed literature and expert opinion. In some cases, the consequences of activities are unknown and a precautionary approach has been applied.

Levels of risk and the associated priority for action are defined as follows:

- Very High – immediate mitigation action required
- High – mitigation action and an adaptive management plan required
- Moderate – obtain additional information and develop mitigation action if required
- Low – monitor the threat occurrence and reassess threat level if likelihood or consequences change

Categories for likelihood are defined as follows:

- Almost certain – expected to occur every year
- Likely – expected to occur at least once every five years
- Possible – might occur at some time
- Unlikely – such events are known to have occurred but only a few times
- Rare or Unknown – may occur only in exceptional circumstances; OR it is currently unknown how often the incident will occur

Categories for consequences are defined as follows:

- Not significant – no long-term effect on individuals or populations
- Minor – individuals are adversely affected but no effect at population level

- Moderate – population recovery stalls or reduces
- Major – population decreases
- Catastrophic – population extinction

Commonwealth of Australia (2020) provided a threat prioritisation risk matrix in which the highest risk threats were associated with the introduction of novel disease, whereas Macgregor et al. (2021) presented a threats assessment in which the highest risk was associated with fisheries prey depletion. In general, Commonwealth of Australia (2020) and Macgregor et al. (2021) highlighted many of the same issues; Table 1 synthesises the results of both approaches to ensure identification of all relevant risks and better conservation outcomes.

Likelihood of occurrence	**Consequence**				
	Not significant	**Minor**	**Moderate**	**Major**	**Catastrophic**
Almost certain		Killing & hunting, Fisheries bycatch Breeding habitat degradation (invasive weeds)	Fisheries – prey depletion.		
Likely					
Possible		Invasive weeds (roosting sites)	Disturbance of habitat	Introduction of new disease	
Unlikely					
Unknown		Heavy metal contamination Marine debris - plastics			

Risk Level	
	Very High
	High
	Moderate
	Low

Table 1. Risk matrix showing the risk associated with each threat identified for the Christmas Island frigatebird (synthesis from Commonwealth of Australia 2020 and Macgregor et al. 2021).

As in any threat/risk assessment process, it is important to consider cumulative impacts, both as a function of a repeated 'low-risk' action and the consequences of the different actions that operate simultaneously. Because there are only a small number of breeding colonies of Christmas Island Frigatebird, all in a small area of one island, loss of any of these existing colonies would have a profound impact and be very difficult to mitigate. Therefore, any activities that result in habitat loss and/or degradation, e.g., introduction of weed species that impact nesting/ roost sites and dust pollution from mining, should be avoided. Additionally, any actions that reduce breeding success, such as the introduction of a new disease into the breeding population, could have large negative consequences. The relatively long generation time, low fecundity, late age at first breeding and protracted chick rearing period mean that any actions that reduce post-fledging and/or adult survival, such as bycatch or directed hunting as well degradation of the foraging environment, are likely to have large consequences on the population and should therefore be a focus for research and, where possible, mitigation.

4. Policies and legislation relevant for management

4.1 International conservation and legal status of the species

IUCN Status	**International Conventions**
Vulnerable: C1a(ii)+C2a(ii): Listed as Vulnerable as the species has a population of fewer than 5000 mature individuals and is estimated to be in continuing decline. The species breeds within a tiny area of occupancy on just one island (Birdlife International 2022a, 2022b).	**CMS** Appendix I (2017) Twelfth meeting of the Conference of the Parties, Manila, Philippines. **CITES** Appendix I (1975)

4.2 International conventions and agreements ratified by Range States

At-sea observation and tracking data describing the entire range of the Christmas Island Frigatebird are incomplete and hence the table below separates Range States where the presence of Christmas Island Frigatebirds has been confirmed from those States where records are sparse, or the species is considered a vagrant (e.g., Vromant & Chau 2007). The latter class are referred to here as Secondary States.

Country	CMS	CBD	Ramsar	EAAFP
Confirmed Range States				
Australia	✓	✓	✓	✓
Indonesia		✓	✓	✓
Malaysia		✓	✓	✓
Philippines	✓	✓	✓	✓
Singapore		✓		✓
Secondary Range States				
Brunei Darussalam		✓		
Cambodia		✓	✓	✓
China		✓	✓	✓
India*	✓	✓	✓	
Japan*		✓	✓	✓
Sri Lanka	✓	✓	✓	
Thailand		✓	✓	✓
Timor-Leste		✓		
Viet Nam*		✓	✓	✓

* Christmas Island Frigatebird is considered a vagrant in range state.
Ramsar - Convention on Wetlands of International Importance especially as Waterfowl Habitat; **EAAFP** – East Asian - Australasian Flyway Partnership.

4.3 National legislation relevant to the Christmas Island Frigatebird

National legislation in Range States relevant to the Christmas Island Frigatebird is detailed below. For convenience, in the following tables the four-letter abbreviation for Christmas Island Frigatebird CIFB is used.

Country	**National Protection Status**	**Law protecting species**	**Responsible Authority**
Australia	Australia has a Federal (Commonwealth) Government with 8 separate State or Territory Governments. CIFB is listed under Commonwealth legislation (see below) but not specifically listed under any other State or Territory legislation. Other State and Territory legislation that is relevant to, but does not specifically list, CIFB includes, inter alia, Western Australia's *Environmental Protection Act* 1986, the Northern Territory's *Territory Parks and Wildlife Conservation Act* 1976, and the Commonwealth *Biosecurity Act* 2015. CIFB is listed as Endangered under the EPBC Act – see Commonwealth of Australia (2020) for details of eligibility against Australian assessment criteria. The CIFB is also listed as Migratory and Marine under the EPBC Act. Listing as Endangered, Migratory and Marine are all considered Matters of National Environmental Significance under the EPBC Act. The CIFB is listed on the China-Australia Migratory Bird Agreement (CAMBA) and protected by both national governments to that agreement.	*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).	Department of Climate change, Energy, the Environment and Water
Indonesia	CIFB is listed as a protected fauna species under Government Regulation No. 7/1999.	Act No.5/1990 on 'Conservation of Living Resources and their Ecosystem' Government Regulation No. 7/1999, 'Preservation of Plants and Animal Species'	
Malaysia	Listed as Totally Protected Wildlife under the Wildlife Conservation Act 2010.	Peninsular Malaysia: Wildlife Conservation Act 2010	Department of Wildlife and National Parks
	Listed as Protected Wildlife under the Wildlife Protection Ordinance 1998.	Sarawak: Wildlife Protection Ordinance 1998 (Protected)	Sarawak Forestry Corporation

Country	**National Protection Status**	**Law protecting species**	**Responsible Authority**
	Listed as Protected Wildlife under the Wildlife Conservation Enactment 1997	Sabah: Wildlife Conservation Enactment 1997 (Protected)	Sabah: Sabah Wildlife Department
Philippines	Protected under a general prohibition on the hunting of wildlife.	Republic Act 9147, (Wildlife Conservation and Protection Act of 2001	Department of Environment and Natural Resources
Singapore	Protected under the general provisions of national legislation for the protection of wildlife The Endangered Species (Import and Export) Act gives effect to enact obligations under CITES, under which the CIFB is listed on Appendix 1.	Wildlife Act 1965 Endangered Species (Import and Export) (Act Chapter 92A, 2006, revised in 2008	National Parks Board Agri-Food & Veterinary Authority of Singapore
Brunei Darussalam	Protected under the general provisions of national legislation for the protection of wildlife	Laws of Brunei Chapter 102 Wild Life Protection Act 1984	
Cambodia	Protected under the general provisions of national legislation for the protection of wildlife	Law on Forestry 2002 Protected Areas Law 2008	Forestry Administration, Department of Wildlife and Biodiversity
China	Included on the List of Wildlife under Special State Protection as designated by the Chinese State Council pursuant to Article 9 of the Law of the People's Republic of China on the Protection of Wildlife. The CIFB is listed on the China-Australia Migratory Bird Agreement (CAMBA) and protected by both Parties to that agreement.	Law of the People's Republic of China on the Protection of Wildlife 1988 Environmental Protection Law 1989 Marine Environment Protection Law 1999	Ministry of Agriculture and Rural Affairs and National Forestry and Grassland Administration

Country	**National Protection Status**	**Law protecting species**	**Responsible Authority**
Hong Kong Special Administrative Region of China	Protected under the general provisions of national legislation for the protection of wildlife	Wild Animals Protection Ordinance 1976	Agriculture, Fisheries and Conservation Department
India	Protected under the general provisions of national legislation for the protection of wildlife	Wild Life (Protection) Act 2022	
Japan	Protected under the general provisions of national legislation for the protection of wildlife Designated as an International Endangered Species under ACES	Wildlife Protection and Hunting Management Law Law for the Conservation of Endangered Species of Wild Fauna and Flora (ACES) 1992	Ministry of the Environment
Sri Lanka	Protected under the general provisions of national legislation for the protection of wildlife. The Fisheries and Aquatic Resources Act prohibits the take of non-target species.	Fauna and Flora Protection Ordinance No.2 1907. Fisheries and Aquatic Resources Act No. 02 (1996)	
Thailand	Protected under the general provisions of national legislation for the protection of wildlife	Wildlife Conservation and Protection Act B.E. 2562 (2019)	
Timor-Leste	No legal protection?		
Viet Nam	Protected under the general provisions of national legislation for the protection of wildlife	Law No. 12/2017/QH14 dated June 20, 2017 of the National Assembly on amending the Criminal Code No. 100/2015/QH	

5. Framework for action

5.1 Goals

To reduce anthropogenic threats to allow the conservation status of Christmas Island Frigatebird to improve.

5.2 Objectives, actions and performance indicators

A description of each objective along with the priority, actions required, responsible organisation and performance success indicators are set out below for all threats identified for the Christmas Island Frigatebird.

Actions are prioritized as:

- Essential
- High
- Medium
- Low

Timescales are attached to each action using the following scale:

- Immediate: completed within the next year
- Short: completed within the next 3 years
- Medium: completed within the next 5 years
- Long: completed within the next 10 years
- Ongoing: currently being implemented and should continue

5.3 Performance review

Consistent with the timescales attached to each action a process for monitoring, reporting and evaluating the performance/implementation of the plan should be carried out to allow a progress update after 3-5 years and a full review after 10 years.

Objective 1: Prevent the introduction of a new disease to the breeding site				
Description: Novel avian diseases can severely impact island bird populations and so pose a very high risk to endemic species such as the CIFB. Strict quarantine procedures and environmental monitoring will reduce the risk by ensuring any avian products coming onto the island do not contain material that may allow the transmission of disease and that any emergent disease are detected before they become established.				
Performance indicator	**Action**	**Priority**	**Time Scale**	**Responsibility**
A biosecurity risk assessment is undertaken and, if needed, a stronger biosecurity barrier at ports of entry is established. No new avian diseases are introduced onto the island.	Conduct a biosecurity risk assessment to identify avian diseases at greatest risk of being introduced to Christmas Island and the mechanism by which they would come onto the island. This must include an examination of the adequacy of existing arrangements to deal with any identified threats.	Essential	Short	Breeding range state
	Reduce the risk of introducing a new avian disease through strict implementation of quarantine procedures for any avian products coming onto Christmas Island.	Essential	Medium	Breeding range state
	Establish a monitoring programme to detect emergent or novel disease that might threatened endemic wildlife.	Essential	Short	Breeding range state

Objective 2: Maintain or improve current policies and legislative protection				
Description: Promoting and improving existing legislative protection across the range of the CIFB would address threats such as mortality arising from fishing gear, mortality from illegal hunting, prey depletion due to fishing, chemical contamination including through ingestion of marine plastics and weed encroachment on roosting habitat.				
Performance indicator	**Action**	**Priority**	**Time Scale**	**Responsibility**
Foraging areas are identified and protected.	Important non-breeding areas are identified.	Essential	Short	Breeding range state Foraging range states
All threats are effectively managed within an appropriate regulatory framework.	Promote the establishment and enforcement of legal mechanisms to protect important habitat of the CIFB and its prey species in its non-breeding range.	Essential	Medium	Foraging range states that support important non-breeding habitat

	Manage key foraging areas protected within the Christmas Island Marine Park to ensure threats to CIFB are mitigated.	Essential	Ongoing	Breeding range state
	Where possible, protect key foraging areas once they are identified, ideally through the creation of marine protected areas.	Essential	Medium	Foraging range states that support important foraging habitat
	Ensure application of relevant legislation and policies that ensure that the CIFB is not displaced from nesting or important roosting habitat due to disturbance or the removal of habitat.	Essential	Medium	Breeding range state Foraging range states
	Encourage the full participation of range states in relevant multi-lateral environment agreements (i.e. CMS, Ramsar) and the EAAFP.	Essential	Medium	Breeding range state Foraging range states
Objective 3: Prevent disturbance to terrestrial habitat				
Description: Vegetation clearance and impacts of industrial activities on Christmas Island were two main causes of historical decreases of CIFB numbers at colonies on the sole breeding location. Preventing further loss and degradation of nesting and roosting habitat is an important component of the conservation management of this species.				
Performance indicator	**Action**	**Priority**	**Time Scale**	**Responsibility**
The protection, extent and quality of habitat is maintained, increased or improved.	Prevent activities that may impact nesting or roosting habitat, or disturb nesting and roosting birds e.g., clearing vegetation that would result in increased wind turbulence or weed invasion in nesting and roosting habitat, or burning of vegetation that would result in smoke entering nesting and roosting habitat.	High	Medium	Breeding range state Foraging range states
	Enhance protection of habitat outside the Christmas Island National Park, particularly in areas buffering nesting colonies from wind turbulence.	High	Medium	Breeding range state

Explicit metrics of nesting habitat extent and quality are developed, and a monitoring program established to measure changes in these.	Undertake field surveys to provide detailed maps of breeding habitat used by CIFB and surrounding vegetation. Monitor changes in area and quality of habitat, including any inadvertent vegetation clearance.	High	Medium	Breeding range state
Targeted surveys are undertaken in any potential habitat proposed for clearance or other change of activity.	Undertake field surveys as part of an environmental impact assessment of all proposals that may occur in or near breeding habitat.	High	Immediate to proposal submittal	Breeding range state Foraging range states

Objective 4: Implement monitoring to support adaptive management				
Description: A structured monitoring programme is essential to determine whether management has been effective and must include the collection of data that will be able to accurately detect changes in the population size, breeding success and quality of habitat of the CIFB. For population monitoring of nesting colonies, drone-based survey methods are preferable. Monitoring information should be summarised and reported, and used to inform future monitoring to adapt to emerging requirements. Monitoring information should be used to assess the relative contribution of management actions towards the improved conservation status of this species.				
Performance indicator	**Action**	**Priority**	**Time Scale**	**Responsibility**
Outputs from monitoring forms a critical part of all environment management programs used to conserve the CIFB and its breeding, roosting and foraging habitat. Environmental management programs respond to the outcomes of monitoring results.	Monitor and report on the implementation and effectiveness of actions to minimise disturbance of current nesting and roosting habitat.	High	Ongoing	Breeding range state Foraging range states
	Monitor and report on the implementation and effectiveness of quarantine procedures used to manage the risk of introducing a new avian disease.	High	Medium	Breeding range state
	Determine the spatial extent of breeding habitat and trends in population size and breeding success by implementing an annual, drone-based, monitoring program on Christmas Island.	High	Immediate, Ongoing	Breeding range state
All monitoring data is made publicly available.	Regularly review and adapt monitoring activities in response to ongoing data, threats and actions.	High	Ongoing	Breeding range state Foraging range states

Objective 5: Research to assist management and understand threats				
Description: There are still substantial knowledge gaps concerning population demographics, especially breeding frequency and success, and distribution of the CIFB that are required to prioritise the threats it faces across its range. This requires ecological research targeting these key conservation information gaps to better understand where conservation actions would be most effective.				
Performance indicator	**Action**	**Priority**	**Time Scale**	**Responsibility**
Year-round movement patterns of juvenile and adult CIFBs and the location of important foraging and roosting areas are identified.	Investigate the feeding behaviour and movement of CIFBs to better understand their geographical distribution during all stages of their life history.	High	Medium	Breeding range state Foraging range states
	Investigate the factors that influence foraging success, including diet, in both breeding and non-breeding areas, and how foraging success affects breeding and timing of subsequent breeding attempts.	Essential	Medium	Breeding range state Foraging range states
	Identify the location of major roost locations away from the breeding location (both breeding and non-breeding seasons), potential threats to roosting birds at those locations and means to mitigate those threats.	Essential	Medium	Breeding range state Foraging range states
	Study the breeding frequency of the two sexes and the factors that influence frequency of breeding attempts.	Essential	Long term	Breeding range state
The exposure to, and impacts of, environmental contamination, marine debris, prey depletion, hunting and bycatch on reproductive success and survival are better understood.	Study the impact of fisheries in south-east Asia on food resource availability for the CIFB.	High	Medium	Foraging range states
	Assess the levels of bycatch in SE Asian fisheries, particularly in gillnets and handline fisheries.	Low	Long	Foraging range states
	Assess levels of ingestion of pollutants, including heavy metals such as mercury and cadmium, and marine plastics, by CIFBs and determine its impact on survival and breeding success.	High	Medium	Breeding range state

Objective 6: Stakeholder engagement to support and improve collaboration among Range States to facilitate the recovery of the Christmas Island Frigatebird				
Description: Supportive, engaged and well-informed stakeholders are crucial to the success of any conservation strategy. Effective protection of important habitat on Christmas Island and in other parts of the species' non-breeding range requires a collaborative approach involving a range of community, landowners, fishermen and managers to ensure success. Communication with the community could include social media, local newspapers, websites and through schools and existing community groups.				
Performance indicator	**Action**	**Priority**	**TimeScale**	**Responsibility**
A stakeholder engagement plan is developed and implemented.	Develop and implement a stakeholder engagement plan, including local and international stakeholders.	High	Short	Breeding range state Foraging range states
Conservation management activities that require collaboration are successfully implemented.	Develop and circulate information products about managing the risks of introducing new avian diseases.	High	Medium	Breeding range state
	Develop and circulate information products about managing habitat and minimising vegetation clearance.	High	Medium	Breeding range state
	Publish updates on CIFB management, and regularly report publicly on all monitoring programs.	High	Immediate	Breeding range state Foraging range states
High level of community support for actions to conserve the CIFB are developed and maintained.	Provide opportunities for regional communities and others to become engaged in research, monitoring or management activities.	High	Ongoing	Breeding range state Foraging range states
	Ensure that interpretational material is developed in the languages of relevant Range States with a role in the conservation of CIFB.	High	Short	Breeding range state Foraging range states

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ANNEX 2

EAAFP/MOP11/Decision 11
ELEVENTH MEETING OF PARTNERS OF THE EAST ASIAN – AUSTRALASIAN FLYWAY PARTNERSHIP Brisbane, Queensland, Australia, 12-17 March 2023

Decision 11
Christmas Island Frigatebird Single Species Action Plan

Concerned that the Christmas Island Frigatebird (*Fregata andrewsi*) is listed as Vulnerable on the IUCN Red List and was also listed on Appendix I of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) at its 12th Conference of the Parties in 2017;

Recognising the vulnerability of the species, the Christmas Island Frigatebird was also included in Appendix III of the East Asian-Australasian Flyway Partnership (EAAFP) as a member of Fregatidae at its 10th Meeting of the Partners in 2018;

Noting that there are existing instruments and mechanisms that address migratory waterbirds in the East Asian – Australasian Flyway, including the CMS and the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar);

Noting further that the Christmas Island Frigatebird Single Species Action Plan covers its entire geographic range, and joint adoption by the EAAFP and CMS offers an opportunity for collaborative conservation of this threatened species*;*

Recalling Objective 5 in conjunction with Paragraph 7 of the Partnership Document, the Plan has been developed by key Ranges States, Australia and the Philippines, in order to provide Range States, Partners and stakeholders with a clear prioritised conservation framework for immediate implementation;

Noting that the Partners, the Seabird Working Group and the Secretariat have consulted with Range States, Partners, non-government organisations, researchers and individuals in 2022 during the

development of the Plan; and

Observing that the Plan sets out relevant biological information, known threats and necessary conservation actions to secure the Christmas Island Frigatebird from extinction.

1

EAAFP/MOP11/Decision 11

The 11th Meeting of Partners
of the East Asian – Australasian Flyway Partnership

1. *Adopts* the International Single Species Action Plan for the Conservation of the Christmas Island Frigatebird (*Fregata andrewsi*) subject to addressing amendments submitted to MoP11 at Attachment A;

2. *Notes* that the Plan will be submitted to the 14th Conference of Parties of CMS in October 2023 for endorsement;

3. *Urges* Ranges States, Partners and other stakeholders to implement relevant provisions of the Action Plan as a matter of priority;

4. *Encourages* Partners to provide technical and/or financial assistance to support activities outlined in the Plan;

5. *Instructs* the Secretariat to make the Plan available on the EAAFP website;

6. *Further instructs* the Secretariat to bring the Plan to the attention of all Range States and relevant stakeholders; and

7. *Requests* the Seabird Working Group to monitor the implementation of the Plan and to report on progress at MoP12.