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PLAN DE ACCIÓN PARA EL ZARAPITO SIBERIANO

(Preparado por el Gobierno de Australia)

Resumen:

El zarapito siberiano es un ave playera migratoria en peligro de extinción que está incluida en los Apéndices I y II de la CMS. La Resolución 11.14 relativa al Programa de Trabajo para las Aves Migratorias y sus Corredores Aéreos recomienda el desarrollo, adopción e implementación de un Plan de Acción para esta especie.

Un grupo de trabajo especial establecido dentro de la Asociación de Corredores Aéreos de Asia Oriental-Australasia (EAAFP, por sus siglas en inglés) preparó en 2015 un Plan de Acción tras consultar a los estados del área de distribución, socios de la EAAFP, organizaciones no gubernamentales y la comunidad investigadora. El Plan de Acción fue aprobado por la EAAFP en su reunión de socios celebrada en Singapur en enero de 2017.

El Plan de Acción identifica amenazas claves y prioriza acciones necesarias para mejorar el estado de conservación del zarapito siberiano en toda su área de distribución. El Plan de Acción se presenta a la COP12 para su adopción con el fin de promover su implementación inmediata.

La implementación del Plan de Acción contribuirá a las metas 8, 9 y 10 del Plan Estratégico para las Especies Migratorias 2015-2023.

PLAN DE ACCIÓN PARA EL ZARAPITO SIBERIANO

Antecedentes

1. El zarapito siberiano (*Numenius madagascariensis*) fue clasificado como Vulnerable en la Lista Roja de la UICN en 2010 y reclasificado como En Peligro en 2015. La especie se incluyó en el Apéndice II de la Convención sobre las Especies Migratorias (CMS) en 2011. Esta especie fue designada para beneficiarse de Acciones Concertadas y Cooperativas dentro del marco de la CMS en 2014. En la actualidad no hay instrumentos internacionales que traten los problemas de conservación en el área de distribución de la especie.

2. La Resolución 11.14 sobre el Programa de Trabajo para las Aves Migratorias y sus Corredores Aéreos recomienda el desarrollo, adopción e implementación de un Plan de Acción Específico (PAE) para el Zarapito Siberiano en Asia Oriental-Australasia, en cooperación con la Asociación de Corredores Aéreos de Asia Oriental-Australasia (EAAFP, por sus siglas en inglés).

3. En la 8ª Reunión de los Socios de la EAAFP en 2015, Australia propuso el establecimiento de un Grupo de Trabajo Especial para el zarapito siberiano. La propuesta fue adoptada de manera unánime y Australia fue elegida como Presidente.

4. El principal propósito del Grupo de Trabajo Especial era redactar y conseguir que la Asociación adoptase el Plan de Acción Internacional de especie individual para el zarapito siberiano, dado que los problemas a los que se enfrenta la especie cumplen los requisitos para el desarrollo de acciones de conservación específicas.

Problemática

5. El zarapito siberiano es una especie endémica del corredor aéreo de Asia Oriental-Australasia y es una de las aves playeras más grandes del mundo. La especie se reproduce en la Federación Rusa y China y migra a Filipinas, Tailandia, Palaos, Malasia, Indonesia, Papúa Nueva Guinea, Australia y Nueva Zelanda durante el periodo no reproductivo.

6. Existen indicios en Australia de un grave descenso en la población del 81,4 por ciento en los últimos 30 años o tres generaciones (5,8 por ciento anual). En gran medida, el descenso observado en el número de zarapitos siberianos proviene de la pérdida continuada de hábitats de marisma en lugares de escala claves en el Mar Amarillo. Si la pérdida y la degradación del hábitat continúan, se espera que la especie siga disminuyendo.

7. El Grupo de Trabajo Especial para el Zarapito Siberiano, en cooperación con la Secretaría de la EAAFP, preparó un borrador de Plan de Acción de Especie Individual que fue enviado a todos los estados del área de distribución, Partes pertinentes de la CMS, Socios de la EAAFP y Presidentes de los Grupos de Trabajo y Grupos Especiales relacionados dentro de la EAAFP el 5 de agosto de 2015. El 17 de diciembre de 2015 se realizó otra consulta específica con los estados del área de distribución, organizaciones no gubernamentales e investigadores. Igualmente se llevó a cabo una consulta escrita con miembros relevantes del personal de la CMS y Consejeros Designados por la COP en 2015 y 2016. Todos los comentarios recibidos fueron considerados y el plan de acción se enmendó de manera correspondiente.

8. El borrador final del Plan de Acción de especie individual fue circulado nuevamente el 1 de abril a todos los Socios de la EAAFP para recibir sus comentarios. Los comentarios fueron añadidos y el borrador del Plan de Acción fue enviado a la Secretaría de la EAAFP para su consideración final.

Discusión y análisis

9. El Plan de Acción fue presentado a la 9ª Reunión de los Socios de la EAAFP celebrada en Singapur en enero de 2017. Todos los comentarios importantes realizados durante la sesión plenaria fueron añadidos. El Plan de Acción fue aprobado por unanimidad por los Socios de la EAAFP.

10. Con el fin de monitorear eficazmente e informar sobre la implementación del Plan de Acción, el Grupo de Trabajo Especial para el Zarapito Siberiano se mantendrá activo dentro de la EAAFP.

11. El Plan de Acción se presenta a la COP12 para su adopción con el fin de promover su implementación inmediata.

12. El Plan de Acción se encuentra adjunto al Anexo 1. En consonancia con la política de la CMS sobre las versiones en diferentes lenguas de los Planes de Acción de Especies el documento está disponible solamente en inglés, ya que su ámbito geográfico no incluye ningún país de habla francesa o hispana.

Acciones recomendadas

13. Se recomienda a la Conferencia de las Partes que:

> Adopte el Plan de Acción contenido en el Anexo 1 mediante la Resolución 12.XX sobre los planes de acción para especies de aves contenida en el documento UNEP/CMS/COP12/Doc.24.1.11.

ANNEX 1

INTERNATIONAL SINGLE SPECIES ACTION PLAN FOR THE CONSERVATION OF THE FAR EASTERN CURLEW (*Numenius madagascariensis*)

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EXECUTIVE SUMMARY

The Far Eastern Curlew (*Numenius madagascariensis*) is the largest shorebird in the world and is endemic to the East Asian – Australasian Flyway. It breeds in eastern **Russia** and north-eastern **China** and travels through **Mongolia**, **Japan**, the **Democratic People's Republic of Korea,** the **Republic of Korea**, **China**, **Vietnam**, **Thailand** and **Malaysia** to its non-breeding grounds. About 25 per cent of the population is thought to spend the non-breeding season in the **Philippines**, **Indonesia** and **Papua New Guinea** but most (estimated at 26,000 individuals) spend the non-breeding season in **Australia**. Evidence from **Australia** suggests that Far Eastern Curlews have declined by an estimated 81 per cent over 30 years and the species is listed as 'Endangered' on the IUCN Red List.

The greatest threat to the survival of the Far Eastern Curlew is the ongoing destruction of tidal mudflats that it utilizes on migration, especially in **China**, **Republic of Korea** and South-East Asia. In addition, hunting in some parts of its range is considered a serious threat. Other issues include human disturbance, pollution, overharvesting of potential prey animals, the effects of drought and overgrazing and climate change on habitats.

The goal of this action plan is to return the Far Eastern Curlew to a positive population growth rate for at least three generations. Essential actions to achieve this are to:

(i) Identify, protect and manage remaining sites used by the species during its annual cycle

(ii) Reduce or eliminate illegal harvesting and incidental bycatch

(iii) Robustly monitor the species' population trend

(iv) Determine key demographic parameters to support population modelling

(v) Constitute a Far Eastern Curlew Task Force and keep it functioning until the goal is achieved.

All Range States must act quickly to halt the Far Eastern Curlew's imminent extinction. All threats must be minimized or preferably eliminated within the next decade. International and regional cooperation is essential to prevent extinction of this migratory shorebird. The East Asian – Australasian Flyway Partnership and the Convention on the Conservation of Migratory Species of Wild Animals (CMS) and other multilateral and bilateral agreements provide the frameworks necessary to ensure meaningful conservation efforts and their coordination across the region.

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1. INTRODUCTION

The Far Eastern Curlew is the largest shorebird in the world. It is endemic to the East Asian-Australasian Flyway (EAAF), breeding in the **Russian Federation** and **China** and migrating as far as **Australia** and **New Zealand**. Declining numbers at the species' staging and non-breeding sites prompted the IUCN Red List to recognise Far Eastern Curlew as 'Endangered' in 2015 (BirdLife International 2015a). In **Australia**, the Far Eastern Curlew has declined by 81 per cent over 30 years (equal to three generations) (Studds et al. in press) and the species is now listed as 'Critically Endangered' under Australia's national environmental law (Australian Government 2015a). If the main threats continue, further declines leading to extinction is expected.

Acknowledging the severe decline of Far Eastern Curlew, the Australian Government initiated the development of this Action Plan under the auspices of the East Asian – Australasian Flyway Partnership. The Partnership and the CMS have endorsed similar Action Plans in the flyway including Action Plans for the Siberian Crane *Leucogeranus leucogeranus* (Ilyashenko et al. 2008), Black-faced Spoonbill *Platalea minor* (Chan et al., 2010), Spoon-billed Sandpiper *Eurynorhynchus pygmaeus* (Zöckler et al. 2010) and the Chinese Crested Tern *Sterna bernsteini* (Chan et al. 2010). All of these Action Plans are being successfully implemented and serve as models for this one.

This Action Plan addresses the issues at important sites along the flyway, ranging from the breeding grounds, stop-over (or staging) and non-breeding sites. To be successful, meaningful international cooperation will be required from all Range States. The mechanism of an international single species action plan has been proven to be effective in improving and coordinating conservation efforts (Boersma et al. 2001). It is the aim of this document to provide a summary of information on the status, threats, and current levels of protection in each Range State and to develop a plan of action. The Action Plan is coordinated by the Far Eastern Curlew Task Force established under the auspices of the East Asian-Australasian Flyway Partnership (EAAFP) and is designed to be implemented by governments and non-government bodies.

This Single Species Action Plan provides an important tool for promoting and coordinating conservation at an international, national and regional level. The Action Plan provides guidance for EAAFP Partners, CMS Parties, Range States, conservationists, researchers and habitat

managers over the next decade, while also providing a model for further advancing migratory bird conservation throughout the flyway. The Action Plan outlines an internationally agreed list of activities necessary along the flyway, to improve the understanding of the species' status, to halt its decline and support its long-term survival.

2. BIOLOGICAL ASSESSMENT

2.1 Taxonomy

Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Species: *Numenius madagascariensis*

Common names: Australian or sea curlew, Eastern Curlew, curlew, Courlis de Sibérie, Zarapito siberiano, Allak-kkorimadoyo, Isabellbrachvogel, Burung Gajahan Timur, Gajahan Timur, Gegajahan paruh besar, Gegajahan timur, Burung Kedidi Kendi Timur, Burung Kedidi Timur, Burung Kendi Timur, Kedidi Timor, Kendi Timur, นกอีก๋อยตะโพกสีน้ำตาล,, Chim Choắt mỏ cong hông nâu, Choắt mỏ cong hông nâu, 大喽儿, 大杓鹬, 紅腰杓鷸, 红腰杓鹬, 黦鷸, Дальневосточный, Дальневосточный кроншеп, Дальневосточный кроншнеп, кроншнеп, Кроншнеп дальневосточный, 알락꼬리마도요, ホウロクシギ, 焙烙鴫, 焙烙鷸, Мадагаскар тутгалжин, [illegible], [illegible], Мадагаскар тутгалжин,

Accepted as Far Eastern Curlew *Numenius madagascariensis* Linnaeus, 1766 (BirdLife International 2015b).

Monotypic, no subspecies are recognized (del Hoyo and Collar 2014). Taxonomic uniqueness: medium (22 genera/family, 8 species/genus, 1 subspecies/species; Garnett et al. 2011). Preliminary research by Q.Q. Bai (unpublished data) on Far Eastern Curlews in Liaoning Province, **China** has suggested the presence of two populations with different moulting strategies on southward migration. One of these populations is thought to spend the non-breeding season in Australia, but the breeding and non-breeding distribution of the other potential population are currently unknown.

2.2 Global Distribution

The Far Eastern Curlew is endemic to the East Asian – Australasian Flyway. Within the **Russian Federation** the Far Eastern Curlew breeds in Siberia and Far Eastern Russia, specifically in Transbaikalia, Magadan Region, northern and southern Ussuriland, Iman River, scattered through south, west and north Kamchatka, lower and middle Amur River basin, Lena River basin, between 110° E and 130° E up to 65° N, and on the Upper Yana River, at 66° N (Higgins & Davies 1996). Although reported to breed in **Mongolia** (e.g. del Hoyo et al. 1996) there are no records, the species only occurring as a migrant (Gombobaatar & Monks 2011; S. Gombobaatar in litt. 25 November 2016; Axel Braunlich in litt. 24 November 2016). However, it is reported to breed in north-eastern **China** (Nei Mongol, Heilongjiang and Jilin) (Zhao 1988; Ma 1992; Wang et al. 2006; Xu 2007) with nests, eggs and young recorded in

Heilongjiang in 1985 (Ma 1992) and three birds breeding/attempting to breed in 2011 (Gosbell et al. 2012).

The Far Eastern Curlew is a migrant in **Mongolia** (Gombobaatar & Monks 2011), **Japan** (The Ornithological Society of Japan 2012), **Democratic People's Republic of Korea** (Tomek 1999), **Republic of Korea** (Moores 2006), and **China** (Wang et al. 2006). Very small numbers are recorded moving through **Thailand** and **Peninsular Malaysia** in the non-breeding season (Melville 1982; Wells 1999; Round 2006). It is a rare passage migrant in **Singapore** (Lim 2015), and there is one record from **Vietnam** (Eames 1997).

During the non-breeding season very small numbers occur in the southern **Republic of Korea**, **Japan** and **China** (Li & Mundkur 2004). About 25 per cent of the population is thought to spend the non-breeding season in Borneo, the **Philippines**, **Indonesia** and **Papua New Guinea** (although Bheeler & Pratt 2016 only record it on passage) but most of the population (estimated in 2008 at 73 per cent) spend the non-breeding season in **Australia** (Bamford et al. 2008). Far Eastern Curlews are regular non-breeding visitors to **New Zealand** in very small numbers (Southey 2009), and occur very rarely on Kermadec Island and the Chatham Islands (Checklist Committee (OSNZ) 2010).

Small numbers of Far Eastern Curlews spend the non-breeding season in **Palau** (McKinlay 2016). It is recorded as a very rare migrant in the **Mariana Islands** (Stinson et al. 1997), and vagrant elsewhere in Micronesia (Yap, Truk/Chuuk, and Guam) (Pratt et al. 1987; Wiles et al.2000; Wiles 2005), and on Savaii, **Samoa** (Pratt et al. 1987). There are occasional records from **Fiji** (Skinner 1983).

It is a vagrant in the Aleutian and Pribilof Islands, Alaska, **USA** (Thompson & DeLong 1969; Gibson & Byrd 2007), with one record in **Canada** (Kragh et al. 1986). Single records from Diego Garcia, **British Indian Ocean Territory** (Carr 2015), **Bangladesh** (Thompson et al. 1993) and **Afghanistan** (Reeb 1977) although Rasmussen & Anderton (2005) consider the latter two records unconfirmed.

During the boreal summer considerable numbers of non-breeding, presumed immature, Far Eastern Curlews occur in the northern Yellow Sea and Bohai (Q.Q. Bai unpublished; N. Moores unpublished). Barter (2002) reported large numbers of 'immature' birds at Yancheng during the boreal summer, but it is unclear whether they still occur at this site as extensive invasion of the tidal flats by smooth cord-grass *Spartina alterniflora* has greatly reduced the value of this site to shorebirds (Melville et al. 2016).

Within **Australia**, the primary non-breeding Range State, the Far Eastern Curlew has a mostly coastal distribution; they are rarely recorded inland. The species is found in all states, particularly the north, east, and south-east regions including Tasmania. Their distribution is continuous from Barrow Island and Dampier Archipelago, Western Australia, through the Kimberley Division and along Northern Territory, Queensland, and New South Wales coasts and the islands of Torres Strait. They occur patchily elsewhere.

Figure 1. Distribution of Far Eastern Curlew (Yellow = Breeding, Pink = Passage and Blue = Non-breeding. Source: BirdLife International 2015b)

2.3 Population size and trend

The global population estimate in 2008 was 38,000 individuals (Bamford et al 2008), but documented declines in Australia (Garnett et al. 2011) resulted in a revised estimate of 32,000 (Wetlands International 2012). Applying a different approach using count data and extrapolation to non-counted habitat resulted in the most recent global population estimate of 35,000 (Hanson et al 2016). The majority of the estimated population – 26,000 to 28,000 birds – occurs in the non-breeding season in **Australia** (Bamford et al. 2008; Hansen et al. 2016), with an additional 5,000 in **Indonesia**, 3,000 in **China** and 2,000 in **Papua New Guinea** (Australian Government 2015a).

Barter (2002) estimated that 31,500 birds (83 per cent of the then estimated world population) stage in the Yellow Sea on northward migration. The species is affected by habitat loss and degradation of intertidal habitat caused by reclamation, major infrastructural development and pollution. There was a 99 per cent decline of Far Eastern Curlew staging at Saemangeum, **Republic of Korea** during northward migration between 2006 and 2014, with evidence of only limited displacement to adjacent sites following seawall closure there in 2006 (Moores et al. 2016). Numbers recorded at the Nakdong Estuary have also declined markedly following a series of development projects including construction of an estuarine barrage in the late 1980s, and reclamation projects and bridge-building in the 2000s, with a maximum count of 635 during southward migration in 1983 but of only 193 during southward migration in 2005 and 46 in 2014 (Wetlands and Birds Korea 2005; Shorebird Network Korea 2015). There were no clear trends in **Japan** between 1978 and 2008 (Amano et al. 2010), but this region lies outside the main migration route of the Far Eastern Curlew, especially during northward migration. There has been a fairly steady decline in Far Eastern Curlew numbers in **New Zealand** since the early 1980s, with an apparent acceleration in the decline since 2004; formerly about 20 birds wintered there (Higgins and Davies 1996) but now fewer do so (Southey 2009). Since 2008

fewer than ten have visited each summer. A few non-breeders stay in **New Zealand** over the southern winter (Riegen 2013).

In Micronesia, Baker (1951) noted the Far Eastern Curlew as 'a regular visitor to western Micronesia, especially Palau Islands', and Wiles et al. (2000) noted: This species was once apparently a regular migrant to western Micronesia but has become much rarer throughout its range in recent decades. Only a handful of reports have been published for the region since 1945'. McKinlay (2016) regularly recorded small numbers on Palau, but noted 'The species was once more common, but sightings elsewhere are now rare'. In **Australia**, numbers appear to have declined on Eighty-mile Beach, Western Australia by c.40 per cent between 2000 and 2008, whereas numbers at Roebuck Bay, Western Australia have remained relatively stable (Rogers et al., 2009). At Moreton Bay, Queensland they declined by c. 2.4 per cent per year between 1992 and 2008 (Wilson et al. 2011), across the whole of Queensland they declined by c. 4.1 per cent per year between 1992 and 2008 (Fuller et al., 2009), in Victoria by 2.2 per cent per year between 1982 and 2011 (Minton et al., 2012) and in Tasmania by 80 per cent between the 1950s and 2000 (Reid & Park 2003) and by 40 per cent across 49 Australian sites between 1983 and 2007 (BirdLife Australia in litt. 2011). An observation of over 2000 Far Eastern Curlews at Mud Islands, Port Phillip Bay, Victoria in 1953 (Tarr and Launder 1954), compared to current counts of fewer than 50 birds in Port Phillip Bay, suggests that population declines in the Far Eastern Curlew may have begun well before regular shorebird counts were initiated in **Australia**. Far Eastern Curlews have declined in south and east Australia more rapidly than those in the west (Clemens et al. 2016).

An unpublished assessment of the numbers of Far Eastern Curlews at roost sites in Tasmania showed decreases of between 55 per cent and 93 per cent, depending on site (cited in Australian Government 2015a). In the southeast, the decrease was 90 per cent for the period 1964/65 – 2010/11, and in the north, the decrease was 93 per cent between 1973/74 and 2010/11 (cited in Australian Government 2015a). At both of these sites, and at other roost sites in Tasmania, the decreases have continued, with fewer birds seen in 2014 (cited in Australian Government 2015a).

In 2015 this species was listed as 'endangered' in the IUCN Red List owing to the past, recent and ongoing rapid population decline of 50-79 per cent in three generations (30 years), based on survey data and habitat loss. Time series data from directly observed summer counts at a large number of sites across **Australia** indicated a severe population decline of 66.8 per cent over 20 years (5.8 per cent per year; Australian Government 2015a), and 81.4 per cent over 30 years which for this species is equal to three generations (Garnett et al. 2011; Australian Government 2015a).

2.4 Habitat requirements

2.4.1 Breeding habitat

Far Eastern Curlews nest during the boreal summer, from early May to late June, often in small congregations of two to three pairs. Pairs breed in open mossy or transitional bogs, moss-lichen bogs and wet meadows, on swampy shores of small lakes and tundra. Nests are positioned on small mounds in swampy ground, often near where wild berries are growing. The nest is lined with dry grass and twigs. Clutches usually contain four eggs. Juveniles may delay breeding until three or four years of age (del Hoyo et al. 1996; Ueta & Antonov 2000; Antonov 2010).

2.4.2 Non-breeding habitat

During the non-breeding season the Far Eastern Curlew is almost entirely dependent on freshwater lake shores, various wetlands, and coastal intertidal habitats. It is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass (Zosteraceae). Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes use the mangroves. The birds are also found in saltworks and sewage farms (Higgins & Davies, 1996).

2.4.3 Feeding habitat

The Far Eastern Curlew mainly forages during the non-breeding season on sheltered intertidal sandflats or mudflats, that are open and without vegetation or covered with seagrass. Far Eastern Curlew often forage near mangroves, on saltflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline, however, they have a preference for soft substrates containing little or no hard material (e.g. rock, shell grit, coral, debris) that provide better access to their prey (Finn et al., 2007, 2008). The birds are rarely seen on near-coastal lakes or in grassy areas (Higgins & Davies, 1996). Inland in East Asia individuals occur in open river valley, marshes and different wetlands with tall vegetation and fresh water lake shores and small islands (Gombobaatar et al. 2011), and saltponds (D.S. Melville unpublished).

2.4.4 Roosting habitat

The Far Eastern Curlew roosts during high tide periods on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. It occasionally roosts on reef-flats, in the shallow water of lagoons, aquaculture ponds and other near-coastal wetlands. Far Eastern Curlews are also recorded roosting in trees and on the upright stakes of oyster-racks (Higgins & Davies 1996). At Roebuck Bay, Western Australia, birds have been recorded flying from their feeding areas on the tidal flats to roost 5 km inland on a claypan (Collins et al. 2001). Within Moreton Bay, Queensland, Australia, the distance over which Far Eastern Curlew typically travel between feeding and roosting habitat is 5-10 km, with high mobility between alternative roosts and/or feeding grounds occurring at or below this distance (Finn et al. 2002). In some conditions, shorebirds may choose roost sites where a damp substrate lowers the local temperature. This may have important conservation implications where these sites are heavily disturbed beaches (Rogers, 1999). From the requirements known for roosting habitat, it may be possible to create artificial roosting sites to replace those destroyed by development (Harding et al., 1999). Far Eastern Curlews typically roost in large flocks, separate from other shorebirds (Higgins & Davies, 1996).

2.5 Migration patterns

The Far Eastern Curlew is migratory. After breeding, they move south for the austral summer.

2.5.1 Departure from breeding grounds

Far Eastern Curlews leave Kamchatka Peninsula (Eastern **Russia**) from mid-July (Ueta et al. 2002) to mid-September. Birds migrate through Ussuriland, **Russia**, from mid-July to late September, birds pass through Sakhalin, (Eastern **Russia**), from mid-July to late August (Higgins & Davies 1996). Fewer birds appear in continental Asia on the southern migration

than on the northern migration (Dement'ev & Gladkov 1951). Far Eastern Curlews are seen in **Democratic People's Republic of Korea, Republic of Korea**, **Japan** and **China** from June to November with birds seen in **Thailand**, the **Peninsular Malaysia**, **Singapore**, the **Philippines**, and Borneo (**Indonesia**, **Brunei** and **Malaysia**), from August to December (White & Bruce 1986; Dickson et al. 1991; Higgins & Davies 1996; Mann 2008; Moon et al. 2013; Choi et al. 2016) likely to be a mix of passage migrants and overwintering individuals. Migrating individuals are often seen with Eurasian Curlews (*Numenius arquata*) by late July to early September in Mongolia (Gombobaatar et al. 2011).

The birds arrive in north-west and eastern **Australia** as early as July (Lane 1987). In north-west Australia, the peak arrival time is in mid-August (Minton & Watkins 1993). There is an onward movement from north-west Australia by October (Lane 1987). Most birds arriving in eastern Australia appear to move down the coast from northern Queensland with influxes occurring on the east coast from mid-August to late December, particularly in late August (Choi et al. 2016). Counts suggest there is a general southward movement until mid-February (Alcorn 1988). Records from Toowoomba, Broken Hill and the Murray-Darling region in August and September suggest that some birds move overland (Higgins & Davies 1996) and the timing of arrival along the east and south-east Australian coasts suggests some fly directly to these areas (Alcorn 1988). In Victoria, most birds arrive in November, with small numbers moving west along the coast as early as August (Lane 1987). In southern Tasmania, most arrive in late August to early October, with a few continuing to arrive until December (Higgins & Davies 1996). When Far Eastern Curlews first arrive in Tasmania they are found at many localities before congregating at Ralphs Bay or Sorell (Thomas 1968).

Far Eastern Curlews arrive in **New Zealand** from the second week of August to mid-November with a median date of mid-October (Higgins & Davies 1996). Although in recent years, very few birds have been seen.

2.5.2 Non-breeding season

During the non-breeding season small numbers of Far Eastern Curlew occur in coastal southern **Republic of Korea**, **Japan**, and **China** (Li & Mundkur 2004). Unquantified numbers occur in **Indonesia**, **Papua New Guinea**, Borneo, and the **Philippines** (Higgins & Davies 1996.Li et al. (2006) recorded at total of 14 Far Eastern Curlews in the whole of **Malaysia** in the period November 2004 to February 2005. In Sabah, **Malaysia** Li et al. (2006) recorded 230 Far Eastern Curlews on the Bako-Semera coastline in April 2005, when it was considered that they may have been migrating.

The majority of the Far Eastern Curlew population is found in **Australia** during the non-breeding season (Bamford et al. 2008), mostly at a few sites on the east coast and in north-western **Australia** (Lane 1987). Population numbers are stable at most sites in November or between December-February, suggesting little movement during this period (Lane 1987; Alcorn 1988).

Analysis of biometrics of Far Eastern Curlew by Nebel et al. (2013) showed that they have a strongly skewed sex ratio in south-eastern **Australia**; only 35.3 per cent of adult Far Eastern Curlew captured were male (*n* = 383 birds). In contrast, 54.3 per cent of adult Far Eastern Curlew captured in north-western **Australia** were male (*n* = 102). These data suggest that male and female Far Eastern Curlew have preferences for different non-breeding areas, with females migrating further south.

2.5.3 Return to breeding grounds

Most Far Eastern Curlews leave **Australia** between late February and March-April (Higgins & Davies 1996; Driscoll & Ueta 2002). The birds depart **New Zealand** from mid-March to mid-May (Higgins & Davies 1996) and peak in abundance at some sites in the **Republic of Korea** in early to mid-April (Moores 2012), and in mid-April in Hong Kong (Carey et al. 2001). The species has been recorded on passage elsewhere mostly between March and May, arriving at Kamchatka, **Russia**, during May (Higgins & Davies 1996).

Like many other large shorebirds, young Far Eastern Curlew can spend their second austral winter in **Australia**, and some may also spend their third winter in **Australia** before undertaking their first northward migration to the breeding grounds (Wilson, 2000). The numbers of birds that remain on the non-breeding grounds during the austral winter are around 25 per cent of the peak austral summer numbers (Finn et al. 2001). Large numbers (locally tens or hundreds) apparently remain throughout the boreal summer at some coastal sites in the **Republic of Korea** (especially in Gyeonggi Bay) (N. Moores pers comm.), and in Liaoning, **China** (Q.Q. Bai unpublished). More research is required to determine whether these are immature birds and/or failed breeders.

2.6 Diet and foraging behaviour

The Far Eastern Curlew's diet on the breeding grounds includes insects, such as larvae of beetles and flies, and amphipods. During August-September, prior to southward migration, berries are also consumed (Gerasimov et al. 1997). During the non-breeding season, Far Eastern Curlew mainly eats crustaceans (including crabs, shrimps and prawns), but small molluscs, as well as some insects are also taken (Dann 2005; Finn et al., 2008; Dann 2014; Zharikov & Skilleter 2003, 2004a, 2004b). In the **Republic of Korea** Far Eastern Curlews principally feed on *Macrophthalmus* crabs (Piersma 1985; Yi et al. 1994).

In Roebuck Bay, Western Australia, the birds feed mainly on large crabs, but will also catch mantis shrimps and chase mudskippers (Rogers, 1999). In southern Australia, Far Eastern Curlews feed on a variety of crabs and shrimps (Dann 2014). Far Eastern Curlews find the burrows of prey by sight during the day or in bright moonlight, but also locate prey by touch. The sexual differences in bill length lead to corresponding differences in diet and behaviour (Higgins & Davies 1996; Dann 2005, 2014). Male and female Far Eastern Curlews use intertidal habitat area differently, with females using more sandy areas and males use more muddy areas (Dann 2014).

The birds are both diurnal and nocturnal with feeding and roosting cycles determined by the tides. Far Eastern Curlews usually feed alone or in loose flocks. Occasionally, this species is seen in large feeding flocks of hundreds (Higgins & Davies 1996).

2.7 Important Sites

In this Action Plan 'important sites' are defined based on a threshold of the Far Eastern Curlew global population. Here we consider sites that contain ≥1 per cent of the population as internationally important and requiring special protective measures (this being equivalent to Criterion 6 for identifying wetlands of international importance under the Ramsar Convention). In some countries, like **Australia**, 'nationally important sites' are defined as those areas that contain ≥0.1 per cent of the population (Australian Government 2015c).

Internationally, the Yellow Sea region is extremely important as stopover habitat for Far Eastern Curlews. It supports about 80 per cent of the estimated flyway population on the northward migration (most of the remaining population apparently staying on the non-breeding grounds). Fewer are counted in the region during the southward migration, but this may be an artefact of their staggered migration.

Relatively few Far Eastern Curlews pass through **Japan** (Brazil 1991). Thirteen sites of international importance were identified in the Yellow Sea (six in **China**, six in **Republic of Korea** and one in **Democratic People's Republic of Korea**) (Barter 2002; Bamford et al. 2008). Twelve sites were considered important during the northward migration and seven during the southward migration, with six sites (Dong Sha, Shuangtaizihekou National Nature Reserve, Ganghwa Do, Yeong Jong Do, Mangyeung Gang Hagu and Dongjin Gang Hagu) important during both (Barter 2002; Bamford et al. 2008). It is important to note that despite being recognized as internationally important, habitat in some of these sites has been destroyed since the Barter (2002) surveys. For example, Mangyeung Gang Hagu and Dongjin Gang Hagu in the **Republic of Korea** (both part of Saemangeum impounded since 2006) are no longer considered important sites for Far Eastern Curlew (Moores et al. 2016). Ganghwa Do (Island), Yeongjong Do (Island), Janghang Coast and Yubu Do (Island) in the Geum Estuary and Namyang Bay now account for nearly 90 per cent of the population in the **Republic of Korea**. In **China**, Bai et al. (2015) identified seven internationally important sites for Far Eastern Curlew in the Yellow Sea region. During northward migration, Yalu Jiang estuarine wetland, Yellow River Delta and Shuangtaizihekou National Nature Reserve are utilized by large numbers of Far Eastern Curlew, particularly Yalu Jiang with 4,840 individuals recorded in April 2011. During southward migration, Yalu Jiang estuarine wetland, Tianjin coast, Zhuanghe Bay, Shuangtaizihekou National Nature Reserve, Cangzhou coast, Rudong coast, and the Yellow River Delta are considered internationally important. Again, Yalu Jiang is the most important site with 5,289 individuals recorded in July 2011(Bai et al. 2015).

Recent surveys in the **Democratic People's Republic of Korea** (Riegen et al. 2016) found internationally important numbers of Far Eastern Curlews at three sites: Ilhae-ri/Sema-ri, Mundok and Undok-ri.

Outside the Yellow Sea, the Moroshechnaya River Estuary in Far East **Russia** is an internationally important site for Far Eastern Curlews during the southward migration. In **Indonesia**, the Banyuasin Delta in Sumatra is important during southward migration (Bamford et al. 2008) and in January (Li et al. 2009), while Pesisir Timur Pantai Sumatera Utara is internationally important in January (Conklin et al. 2014). In Sarawak, **Malaysia,** Pulau Bruit is internationally important for Far Eastern Curlews during northward migration (Mann 2008), and Sejinkat Ashponds is an internationally important non-breeding site (Conklin et al. 2014). There are few records from **Brunei Darussalam** (Moore undated). Bamford et al. (2008) identified the Kikori Delta as an important site in **Papua New Guinea** and Conklin et al. (2014) added the Bensbach-Bula coast.

During the non-breeding season, **Australia** is the most important country in the EAAF accounting for at least 73 per cent of the population (Bamford et al. 2008). At least 19 sites have been identified as internationally important for the Far Eastern Curlew (Bamford et al. 2008). Most are located along the north and east coasts of **Australia** and four sites are located in the southern state of Victoria. Both Moreton Bay in Queensland and Buckingham Bay in the Northern Territory have been identified as internationally important austral wintering sites for the Far Eastern Curlew, probably containing young birds that have not made the migration north.

Many of these sites are based on old count data and an outdated population level threshold (estimate 38 000; 1 per cent = 380 individuals). Recent work suggests the population estimate is no greater than 35,000 individuals (1 per cent = 350) (Hansen et al. 2016). There is an urgent need to reassess the number and location of sites of international importance based on this new population estimate.

3. THREATS

The main threat to Far Eastern Curlew is considered to be reclamation of intertidal flats for tidal power plants and barrages, port development, industrial use, agricultural and urban expansion in the Yellow Sea where it stages on migration (Bamford et al. 2008; van de Kam et al. 2010; Murray et al. 2014; Melville et al. 2016). Other threats along their migration route include hunting, incidental capture in fishing nets, environmental pollution, invasive cordgrass *Spartina,* reduced river flows resulting in reduced sediment flows competition for food from humans harvesting intertidal organisms, and human disturbance (Barter 2002; Chen and Qiang 2006; Moores 2006; Melville et al. 2016). Threats in **Australia**, especially eastern and southern **Australia**, include ongoing human disturbance, habitat loss and degradation from pollution and structural modification of soft-sediment feeding flats, changes to water regimes and invasive plants (Rogers et al. 2006; Finn 2009; Garnett et al. 2011; Australian Government 2015 a,b,c).

Human disturbance can cause shorebirds to interrupt their feeding or roosting and may influence the area of otherwise suitable feeding habitat that is actually used. Far Eastern Curlews are amongst the first shorebirds to take flight when humans approach to within 30–100 metres (Taylor & Bester, 1999), 185 metres (Paton et al. 2000), or even up to 250 metres away (Peter 1990). Coastal development, port development, land reclamation, construction of barrages and stabilization of water levels can destroy feeding habitat (Close & Newman 1984; Sutherland et al. 2012; Melville et al. 2016). Pollution around settled areas may reduce the availability of food by altering prey composition and/or reducing substrate penetrability (Close & Newman 1984; Finn 2009). The species has been hunted intensively on breeding grounds and at stopover points while on migration and on the non-breeding grounds (Higgins & Davies 1996; Gerasimov et al. 1997). Illegal hunting in Russia is still occurring occasionally (Y. Gerasimov pers. comm.).

3.1 Description of key threats

3.1.1 Habitat loss

Habitat loss occurring as a result of development is the most significant threat currently affecting migratory shorebirds along the EAAF (Melville et al. 2016). Of particular concern in the EAAF is coastal development and intertidal mudflat 'reclamation' in the Yellow Sea region, which is bordered by **China**, the **Democratic People's Republic of Korea** and the **Republic of Korea** (Murray et al. 2014; Melville et al. 2016). A migratory shorebird's ability to complete long migration flights depends on the availability of suitable habitat at sites throughout the EAAF that provide adequate food and roosting opportunities to rebuild energy reserves (Piersma et al. 2015).The Yellow Sea region is the major staging area for several species of shorebird, including almost the entire population of the Far Eastern Curlew, which flies between **Australia** and the east coast of Asia on migration (Barter 2002; Bamford et al. 2008; Minton et al. 2011, 2013; Iwamura et al. 2013; Moores et al. 2016). In a recent study using historical topographical maps and remote sensing analysis, Murray et al. (2014) showed that 65 per cent

of the tidal flats that existed in the Yellow Sea in the 1950s have disappeared, from a combination of coastal development and reduced sediment input to the Yellow Sea which is some areas is resulting in erosion. Losses of such magnitude are the key drivers of decreases in biodiversity and ecosystem services in the intertidal zone of the region (MacKinnon et al. 2012; Ma et al. 2014). Further reclamation projects are ongoing or are in the planning stage in the Yellow Sea region; for example, Jiangsu Province, **China** plans to reclaim 1,800 km^2 (Zhang et al. 2011).

Overall, coastal development in east and south-east Asia is accelerating and is already at a pace which is unprecedented in other parts of the world. Examples of urban expansion in coastal areas are well known from **Australia**, the **Republic of Korea**, **Japan**, and **Singapore** and most other countries in the region. Development for industry, housing, tourist and transport infrastructure is widespread. In some coastal areas, intertidal areas are increasingly used for conversion into land for new settlements and intensive aquaculture.

Habitat loss in the breeding grounds has also occurred, for instance, in the Amur River basin, there are examples of hydroelectric scheme dams inundating nesting areas e.g. the Zea reservoir in the 1970s and further dams in the future could destroy other breeding areas (Brown et al. 2014). Studies analysing satellite images indicated a decrease of 80 per cent marshland (i.e. potential nesting ground for Far Eastern Curlew) over the last 50 years in north-east Heilongjiang Province, **China** (Liu et al. 2004; Liu et al. 2015). The authors' study area overlapped with the breeding ranges identified in Far Eastern Curlew geolocator studies (Gosbell et al. 2012).

Drought and livestock overgrazing in the major migrating and stopover site in Mongolia have been leading to habitat degradation and loss (Gombobaatar et al. 2011).

3.1.2 Habitat degradation

Modification of wetland habitats can arise from a range of different activities including fishing or aquaculture, forestry and agricultural practices, mining, changes to hydrology and development near wetlands for housing or industry (Lee et al. 2006; Sutherland et al. 2012; Melville et al. 2016). Steppe fires in spring and autumn destroy their feeding habitats in Mongolia (Gombobaatar et al. 2011). Such activities may result in increased siltation, pollution, weed and pest invasion, all of which can change the ecological character of a shorebird area, potentially leading to deterioration of the quantity and quality of food and other resources available to support migratory shorebirds (Sutherland et al. 2012 and references therein; Ma et al. 2014; Murray et al. 2015; Melville et al. 2016). The notion that migratory shorebirds can continue indefinitely to move to other important habitats as their normal feeding, staging or roosting areas become unusable is erroneous. As areas become unsuitable to support migratory shorebirds, areas that remain will likely attract displaced birds, in turn creating overcrowding, competition for food, depletion of food resources, and increased risk of disease transmission. The areas identified today are likely to represent the great majority of suitable stop-over sites and are irreplaceable. They need to be protected immediately and managed appropriately to ensure the species' survival.

Structural modification of feeding flats

Far Eastern Curlews require deep deposits of soft, penetrable sediment to realize their greatest foraging potential. Any structural modification of the Far Eastern Curlews' soft- sediment feeding flats that reduces the substrate penetrability may inhibit successful foraging and be detrimental to them (Finn 2009). There are several causes of structural modification that may

reduce the substrate penetrability of intertidal flats. Direct effects include activities such as intertidal oyster farming, the compaction of sediments by vehicles, the dumping of rubbish or debris and the artificial building up of beaches by adding foreign sediment to the intertidal zone. Indirect effects on the structure of soft-sediment intertidal zones can come from processes such as nutrient enrichment and the use of chemicals, such as the organophosphorus pesticide triazophos, to kill predators prior to spat seeding in aquaculture (Melville et al. 2016).

Intertidal oyster or mussel farming, whether bottom or suspended culture, may degrade the foraging habitat of shorebirds (Hilgerloh et al. 2001; Caldow et al. 2003; Connolly & Colwell 2005). The sediment structure may be rendered less penetrable by the presence of hard-shelled bivalves in abnormally high densities, the structures used for attaching bivalves (such as trestles) and/or the use of mechanical devices during harvest (such as dredges; Piersma et al. 2001; Connolly & Colwell 2005).

The compaction of sediments by vehicles may reduce the penetrability of the substrate and thereby inhibit burying by invertebrates and probing by shorebirds (Evans et al.1998; Moss & McPhee 2006; Schlacher et al. 2008).

Physical modifications of soft sediments that increase their coarseness or hardness such as that caused by the dumping of rubbish or debris (including dredge spoil) and even beach filling (nourishment) are highly likely to degrade feeding habitats for deep-probing shorebirds (Peterson et al. 2006). The dumping of dredge spoil may however be important in some areas above highest astronomical tide for providing suitable roosting habitat for shorebirds (Yozzo et al. 2004).

Processes that increase the available nutrients in the intertidal zone (such as sewage discharge and runoff from terrestrial soils) may lead to eutrophication and the proliferation of algal mats (Raffaelli 1999; Lopes et al. 2006). These algal mats may reduce substrate penetrability and are therefore likely to be avoided by deep-probing shorebirds, unless there is an associated increase in suitable prey at the substrate surface (Lewis & Kelly 2001).

Farming

In southern parts of the breeding range, both arable and livestock farming are increasing, and this thought to be degrading breeding habitats (Brown et al. 2014). The burning of grasslands is an important land management practice in this area. Anecdotal evidence at one breeding site suggests Far Eastern Curlew preferentially nest within recently-burned grasslands, with high nest success recorded (Antonov 2010). After nesting, chicks are frequently observed foraging in nearby swamps and sedge meadows, suggesting a mosaic of unburnt grassland, burnt grasslands and wetlands is important (Antonov 2010). However, burning can also have a devastating impact on breeding success if undertaken during the nesting period: one study to the south of the Amur region recorded 28 per cent of nests destroyed by fires (Antonov 2010). The timing of burning is therefore of critical importance. The impact of regular burning on invertebrate food resources is not well understood (Brown et al. 2014).

Invasive species

Of specific concern for migratory shorebirds is the introduction of exotic marine pests resulting in loss of benthic food sources at important intertidal habitat (Neira et al. 2006). Predation by invasive animals, such as cats (*Felix catus*) and foxes (*Vulpes vulpes*) in **Australia** has not been quantified, but anecdotal evidence suggests some individuals are taken as prey.

Invasive species are negatively affecting coastal habitats, causing local species to be displaced by species accidentally or deliberately introduced from other areas. With an increase in global shipping trade the influx of such species is increasing, especially in the coastal zone. In **China** smooth cordgrass *Spartina alterniflora* was deliberately introduced to speed accretion and by 2007 covered at least 34,451 ha of former tidal flats (Zuo et al. 2012) and has been responsible for the severe degradation of the intertidal areas at Yancheng National Nature Reserve, Jiangsu Province (Liu et al. 2016) – a site that Barter (2002) noted as internationally important for the Far Eastern Curlew.

Harvesting of shorebird prey

Overharvesting of intertidal resources, including fish, crabs, molluscs, annelids, sea-cucumber, sea-urchins and seaweeds can lead to decreased productivity and changes in prey distribution and availability (MacKinnon et al. 2012). The recent industrialization of harvesting methods in **China** has resulted in greater harvests of intertidal flora and fauna with less manual labour required, which is impacting ecosystem processes throughout the intertidal zone (MacKinnon et al. 2012). In many important shorebirds areas, the intertidal zone is a maze of fishing platforms, traps and nets that not only add to overfishing, but prevent access to shorebird feeding areas by causing human disturbance (Melville et al. 2016).

Altered hydrological regimes

Altered hydrological regimes can directly and indirectly threaten migratory shorebird habitats. Water regulation, including extraction of surface and ground water (for example, diversions upstream for consumptive or agricultural use), can lead to significant changes to flow regime, water depth and water temperature. Reduced water flows and associated reduced sediment discharge from the Yellow and Yangtze Rivers in China are having major impacts on near coast environments (Murray et al. 2015). Changes to flows can lead to permanent inundation or drying of connected wetlands, and changes to the timing, frequency and duration of floods. These changes impact both habitat availability and type (for example, loss of access to mudflats through permanent higher water levels, or a shift from freshwater to salt-tolerant vegetation communities), and the disruption of lifecycles of plants and animals in the food chain for migratory shorebirds.

Reduced recharge of local groundwater that occurs when floodplains are inundated can change the vegetation that occurs at wetland sites, again impacting habitat and food sources.

Water regulation can alter the chemical make-up of wetlands. For example, reduced flushing flows can cause saltwater intrusion or create hyper-saline conditions. Permanent inundation behind locks and weirs can cause freshwater flooding of formerly saline wetlands, as well as pushing salt to the surface through rising groundwater.

3.1.3 Climate change

Climate change is expected to have a major impact on coastal mudflats and breeding habitat throughout the EAAF. Such changes have the potential to impact on all migratory shorebirds and their habitats by reducing the extent of coastal and inland wetlands or through a poleward shift in the range of many species (Chambers et al. 2005; Iwamura et al. 2013; Wauchope et al. 2015). Climate change projections for the EAAF suggest likely increased temperatures, rising sea levels, more frequent and/or intense extreme climate events resulting in likely species loss and habitat degradation (Chambers et al. 2005, 2011; Iwamura et al. 2013; Nicol et al. 2015).

The Far Eastern Curlew's breeding range is in a region predicted to be one of the most heavily influenced by climate change (Wauchope et al. 2015). Rising annual and summer temperatures will change the vegetation composition making areas less suitable as breeding habitat for the species. Predictions of decreasing precipitation in both winter and spring will lead to drying breeding habitat and loss of preferred nesting habitat around swampy ground. Depending on the exact geographical location and microclimate conditions, this could mean significant changes in key breeding habitats.

3.1.4 Hunting, Poaching and Incidental Take

Hunting of migratory shorebirds in **Australia** and **New Zealand** has been prohibited for a number of decades. It is unclear if illegal hunting occurs during the annual duck hunting season in certain Australian states. Far Eastern Curlews were shot for food in Tasmania, **Australia** until the 1970s (Park 1983; Marchant & Higgins 1993). Hunting also appears to have decreased in the **Republic of Korea**, with the only reported instance being minor hunting activity in Mangyeung Gang Hagu (Barter 2002).

Investigations into shorebird hunting activities at internationally important sites in **China** in the early 1990s, including in the Chang Jiang Estuary, Yellow River delta and Hangzhou Bay, suggested that tens of thousands of shorebirds were being trapped annually (Tang & Wang, 1991, 1992, 1995; Barter et al. 1997; Ma et al. 1998). Of 8,828 birds caught by hunters and identified there were 62 Far Eastern Curlews (0.7%) (Tang & Wang 1995). Studies during the 2000-2001 period indicate that hunting activity had declined at Chongming Dao, **China** (Ma et al. 2002).

Wang et al. (1991, 1992) reported hunting activity in the Yellow River Delta, estimating that 18,000-20,000 shorebirds were caught with clap nets during northward migration in 1992 and probably a higher number during southward migration in 1991. However, no hunting was observed in the Yellow River Delta during surveys in the 1997, 1998 and 1999 northward migrations (Barter 2002). With the exception of the Chang Jiang Estuary, no hunting activity was detected in **China** during shorebird surveys that covered about one-third of Chinese intertidal areas between 1996 and 2001 (Barter 2002).

They have been hunted at stopover points while on migration as well as on their breeding grounds in the **Russian Federation** where hunting has been reported since at least the 1980s (Tomkovich 1996), and Gerasimov et al. (1997) considered hunting to be main reason for the decline in numbers in Kamchatka. More recently, hunting of Far Eastern Curlews in **Russia** has been recorded as part of duck hunting (Victor Degtyaryev, Igor Fefelov, pers. comm. 2014). In the **Russian Federation** a special hunting season for shorebirds occurs before the season for hunting ducks, mainly for Whimbrels. It has been suggested that hunters cannot correctly distinguish Far Eastern Curlews from Whimbrels, particularly considering that young Far Eastern Curlews have a shorter bill in August (E. Syroechkovskiy). There are no current data on levels of take in the breeding grounds, and "occasional" hunting remains by most as a qualitative assessment, which is insufficient to assess population-level effects.

Mist-netting of shorebirds for local consumption and to supply local food markets still occurs in a number of countries, including **China**, although generally not in areas where Far Eastern Curlews are concentrated (Melville et al. 2016). Incidental catch in fishnets, however, is known to kill Far Eastern Curlews in Liaoning, **China** (D.S. Melville unpublished). Deliberate poisoning of curlews using the organochloride pesticide hexachlorocyclohexane has also been reported in **China** (Melville et al. 2016). It is unclear if the Far Eastern Curlew makes up a significant

proportion of the take. However, even if only small numbers are taken, the impact could be severe in the long term. Turrin & Watts (2016) were unable to estimate sustainable harvest levels for Far Eastern Curlews due to gaps in knowledge of the birds' life history. Considering that the current level of take across the entire range of this species is unknown, it is not justified to conclude that low levels of hunting at small spatial scales have negligible deleterious population-level effects.

Illegal fishing activities using gill nets, and abandoned gill nets on shore are potential impacts on the species in Mongolia (Gombobaatar et al. 2011).

3.1.5 Disturbance

Human disturbance of Far Eastern Curlews includes recreation, fishing, shell-fishing, research and monitoring activities. Disturbance from human activities has a high energetic cost to shorebirds and may compromise their capacity to build sufficient energy reserves to undertake migration (Goss-Custard et al. 2006; Weston et al. 2012; Lilleyman et al. 2016). Disturbance that renders an area unusable is equivalent to habitat loss and can exacerbate population declines. Disturbance is greatest where increasing human populations and development pressures impact important habitats. Migratory shorebirds are most susceptible to disturbance during daytime roosting and foraging periods. As an example, disturbance of migratory shorebirds in **Australia** is known to result from aircraft over-flights, industrial operations and construction, artificial lighting, and recreational activities such as fishing, off-road driving on beaches, unleashed dogs and jet-skiing (Weston et al. 2012; Lilleyman et al. 2016). Careful planning can allow for both recreational activities and maintenance of shorebird populations in important coastal habitats (Stigner et al. 2016).

A recent study by Martin et al. (2014) examined the responses to human presence of an abundant shorebird species in an important coastal migration staging area. Long-term census data were used to assess the relationship between bird abundances and human densities and to determine population trends. In addition, changes in individual bird behaviour in relation to human presence were evaluated by direct observation of a resident shorebird species. The results showed that a rapid increase in the recreational use of the study area in summer dramatically reduced the number of shorebirds and gulls which occurred, limiting the capacity of the site as a post-breeding stop-over area (Martin et al. 2014). In addition, the presence of people at the beach significantly reduced the time that resident species spent consuming prey. Martin et al. (2014) found negative effects of human presence on bird abundance remained constant over the study period, indicating no habituation to human disturbance in any of the studied species. Moreover, although intense human disturbance occurred mainly in summer, the human presence observed was sufficient to have a negative impact on the long-term trends of a resident shorebird species. Martin et al. (2014) suggested that the impacts of disturbance detected on shorebirds and gulls may be reversible through management actions that decrease human presence. The authors suggest minimum distances for any track or walkway from those areas where shorebirds are usually present, particularly during spring and summer, as well as appropriate fencing in the most sensitive areas.

Tidal flats in the Yellow Sea frequently have hundreds of people collecting sea food and undertaking aquaculture activities. In some areas where bivalve spat has been seeded out on to tidal flats fireworks are used to deliberately scare birds away, and firecrackers may be used by photographers to make birds fly for spectacular photographs (D.S. Melville unpublished). Disturbance from tourist camps and resorts near large lakes and rivers is also influence migrating individuals in Mongolia (Gombobaatar et al. 2011).

3.1.6 Pollution

Chronic pollution

Shorebird habitats are threatened by the chronic accumulation and concentration of pollutants. Chronic pollution may arise from both local and distant sources. Migratory shorebirds may be exposed to chronic pollution while utilising non-breeding habitats and along their migration routes, although the extent and implications of this exposure remains largely unknown although some studies have been conducted in the **Republic of Korea** (Kim et al. 2007a, b; Kim & Koo 2008; Kim et al. 2009). In their feeding areas, shorebirds are most at risk from bioaccumulation of human-made chemicals such as organochlorines from herbicides and pesticides and industrial waste. High levels of DDT are still found in many parts of **China**'s Yellow Sea coast, mostly apparently from anti-fouling paint used on wooden fishing boats (Melville et al. 2016). Agricultural, residential and catchment run-off carries excess nutrients, heavy metals, sediments and other pollutants into waterways, and eventually wetlands. Gold and other mining activities and pollution of wetlands, illegal fishing activities using gill nets, and abandoned gill nets on shore are potential impacts on the species in Mongolia (Gombobaatar et al. 2011). Shorebirds could be at risk from marine microplastics (Sutherland et al.2012), as these birds prey on invertebrates that are known to ingest microplastics by filter-feeding. This gap in our current knowledge provides an opportunity for directed research.

Acute pollution

Wetlands and intertidal habitats are threatened by acute pollution caused by, for example, oil or chemical spillage (Melville 2015). Acute pollution generally arises from accidents, such as chemical spills from shipping, road or industrial accidents. Generally, migratory shorebirds are not directly affected by oil spills, but the suitability of important habitat may be reduced for many years through catastrophic loss of marine benthic food sources.

3.2 Threat prioritization

Each of the threats outlined above has been assessed to determine the risk posed to Far Eastern Curlew populations using a risk matrix. This in turn determines the priority for actions outlined in Section 5. The risk matrix considers the likelihood of an incident occurring and the population level consequences of that incident. Threats may act differently in different locations and populations 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 uses a qualitative assessment drawing on peer reviewed literature and expert opinion. In some cases the consequences of activities are unknown. In these cases, the precautionary principle 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, the precautionary principle should be applied

Moderate – obtain additional information and develop mitigation action if required

Low – monitor the threat occurrence and reassess threat level if likelihood or consequences change

Figure 3. Risk Prioritization

Likelihood	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain	Low	Moderate	Very High	Very High	Very High
Likely	Low	Moderate	High	Very High	Very High
Possible	Low	Moderate	High	Very High	Very High
Unlikely	Low	Low	Moderate	High	Very High
Rare or Unknown	Low	Low	Moderate	High	Very High

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 on a worldwide basis 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

Figure 4. Far Eastern Curlew Population Residual Risk Matrix

Likelihood of occurrence	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain		Harvesting of shorebird prey	Hunting, Poaching and Incidental Take Disturbance	Climate change	Habitat loss
Likely		Chronic pollution Invasive species	Altered hydrological regimes Structural modification of feeding flats Farming		
Possible					
Unlikely			Acute pollution		
Rare or Unknown					

4. POLICIES AND LEGISLATION RELEVANT FOR MANAGEMENT

4.1 International conservation and legal status of the species

IUCN Status	CMS
EndangeredA2bc+3bc+4bc (2015): **A taxon is Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing a very high risk of extinction in the wild:** **A. Reduction in population size based on any of the following:** **1. An observed, estimated, inferred or suspected population size** reduction of ≥ 70% over the last 10 years or three generations, **whichever is the longer, where the causes of the reduction are clearly reversible AND understood AND ceased, based on (and specifying) any of the following:** **(a) direct observation** **(b) an index of abundance appropriate to the taxon** **(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat** **(d) actual or potential levels of exploitation** **(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.** **2. An observed, estimated, inferred or suspected population size** reduction of ≥ 50% over the last 10 years or three generations, **whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.** 3. A population size reduction of ≥nbsp;50%, projected or suspected **to be met within the next 10 years or three generations, whichever is the longer (up to a maximum of 100 years), based on (and specifying) any of (b) to (e) under A1.** **4. An observed, estimated, inferred, projected or suspected** population size reduction of ≥ 50% over any 10 year or three **generation period, whichever is longer (up to a maximum of 100 years in the future), where the time period must include both the past and the future, and where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible, based on (and specifying) any of (a) to (e) under A1.**	**Appendix I (2011)** **Appendix II as part of the Scolopacidae.** **Designated for Concerted and Cooperative action at COP11 (Quito, Ecuador, 2014).**

4.2 International conventions and agreements ratified by Range States

Country	CMS	CBD	Ramsar	EAAFP
Australia	✓	✓	✓	✓
Brunei Darussalam		✓		
Cambodia		✓	✓	✓
China		✓	✓	✓
Fiji*	✓	✓	✓	
Guam (to USA)*			✓	
Indonesia		✓	✓	✓
Japan		✓	✓	✓
Democratic People's Republic of **Korea**		✓		
Republic of Korea		✓	✓	✓
Malaysia		✓	✓	✓
Federated States of Micronesia*		✓		
Mongolia	✓	✓	✓	✓
New Zealand	✓	✓	✓	✓
New Caledonia & French Polynesia (to France)*	✓	✓	✓	
Northern Mariana Islands (to USA)*			✓	
Palau	✓	✓	✓	
Papua New Guinea		✓	✓	
Philippines	✓	✓	✓	✓
Russian Federation		✓	✓	✓
Singapore		✓		✓

Thailand		✓	✓	✓
Timor-Leste		✓		
Vietnam		✓	✓	✓

* Considered a vagrant.

4.3 National legislation relevant to the Far Eastern Curlew

Country	National Protection Status	Law protecting species	Legal protection from illegal killing, taking, trading, keeping or moving.	Penalties	Responsible Authority
Australia	Commonwealth: **Critically Endangered** State: QLD:**Near threatened** NSW: Not listed NT:**Vulnerable** SA:**Vulnerable** TAS: **Endangered** WA:**Vulnerable** VIC:**Vulnerable**	Australia has a Federal Government with 8 separate State or Territory Governments. The Australian Government has responsibility for matters in the national interest, and for non-state/territory areas, which includes the marine environment from 3 nautical miles out to the edge of the Exclusive Economic Zone (EEZ). The State and Territory governments have responsibility for issues within their jurisdictional borders, including State/Territory waters.	Yes, through Commonwealth and State/Territory implementing legislation.	The EPBC Act provides penalties (financial and incarceration time) for various offences relating to listed threatened and migratory shorebirds. Penalties for offenses relating to native wildlife exist under other Commonwealth, State and Territory legislation.	Department of the Environment (Commonwealth)

Country	National Protection Status	Law protecting species	Legal protection from illegal killing, taking, trading, keeping or moving.	Penalties	Responsible Authority
		Far Eastern Curlews are listed as threatened, migratory and marine under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is an offence to kill, injure, take, trade, keep or move the species in a Commonwealth area (i.e. Commonwealth waters), unless the person taking the action holds a permit under the EPBC Act. **Implementing legislation:** **Commonwealth**: *Environment Protection and Biodiversity Conservation Act 1999*			

Country	National Protection Status	Law protecting species	Legal protection from illegal killing, taking, trading, keeping or moving.	Penalties	Responsible Authority
		QLD: *Nature Conservation Act 1992* **NSW**: *Threatened Species Conservation Act 1995; National Parks and Wildlife Act 1974* **NT**: *Territory Parks and Wildlife Conservation Act 2000* **SA**: *National Parks and Wildlife Act 1972* **TAS**: *Threatened Species Protection Act 1995; Living Marine Resources Management Act 1995* **WA**: *Wildlife Conservation Act 1950; Conservation and Land Management Act 1984* **VIC**: *Wildlife Act 1975; Flora and Fauna Guarantee Act 1988*			
Brunei Darussalam					

Country	National Protection Status	Law protecting species	Legal protection from illegal killing, taking, trading, keeping or moving.	Penalties	Responsible Authority
Cambodia					
China	Far Eastern Curlew is listed in the *Lists of terrestrial wildlife under state protection, which are beneficial or of important economic or scientific value.*	*Environmental Protection Law 1989* *Law of the People's Republic of China on the Protection of Wildlife 1988* *Marine Environment Protection Law 1999*	Law of the People's Republic of China on the Protection of Wildlife indicates: -Hunting without licence is prohibited -Activities which are harmful to the living and breeding of wildlife shall be prohibited. - The areas and seasons closed to hunting as well as the prohibited hunting gear and methods shall be specified by governments at or above the county level or by the departments of wildlife administration under them - The hunting or catching of wildlife by the use of military weapons, poison or		

Country	National Protection Status	Law protecting species	Legal protection from illegal killing, taking, trading, keeping or moving.	Penalties	Responsible Authority
			explosives shall be prohibited.		
Hong Kong Special Administrative Region of China	Protected	*Wild Animals Protection Ordinance*	Hunting and possession prohibited	Depending on offense; imprisonment or a fine of HK$10,000-100,000.	Agriculture, Fisheries and Conservation Department
Indonesia					
Japan	National Red List: **Vulnerable**	Far Eastern Curlew is designated as a rare wild animal species under the *Wildlife Protection Control and Hunting Management Act*, and taking of the birds or their eggs is prohibited unless the person taking the action holds a permit by the Minister of the Environment.	Taking of the birds or their eggs is prohibited unless the person taking the action holds a permit by the Minister of the Environment.	The *Wildlife Protection Control and Hunting Management Act* provides penalties (financial and incarceration time) for illegal taking of the birds and their eggs.	Ministry of the Environment
Democratic People's Republic of Korea					
Republic of Korea	Endangered Species II Marine Organisms under Protection	*Wildlife Protection and Management Act*	Protected legally by prohibition of illegal	Punished by imprisonment for not more than 3 years or	Ministry of Environment Ministry of Oceans and Fisheries

Country	National Protection Status	Law protecting species	Legal protection from illegal killing, taking, trading, keeping or moving.	Penalties	Responsible Authority
		Conservation and Management of Marine Ecosystems Act	capture, collecting, keeping, trading.	by a fine not exceeding 30 million won.	
Malaysia	No National Red List for Birds	Peninsular Malaysia: Wildlife Conservation Act 2010 (Totally Protected) Sarawak: Wildlife Protection Ordinance 1998 (Protected) Sabah: Wildlife Conservation Enactment 1997 (Protected)	No hunting, taking etc. in Peninsular Malaysia under the law. For Sabah and Sarawak, limited hunting is permitted with proper licence.	Jail term and/or financial penalties.	Peninsular Malaysia: Department of Wildlife and National Parks (PERHILITAN) Sarawak: Sarawak Forestry Corporation (SFC) Sabah: Sabah Wildlife Department (SWD)
Mongolia	In Mongolia, it is assessed as Least Concern. Approximately 7.1% of the species' range in Mongolia occurs within protected areas (Gombobaatar et al. 2011).	Mongolian Law on Nature Protection (2005), Mongolian Law on Fauna (2012)	Mongolian Law on Nature Protection (2005), Mongolian Law on Fauna (2012)		Ministry of Environment and Tourism of Mongolia
New Zealand	New Zealand Threat Classification Status:	Far Eastern Curlew are "Absolutely Protected Wildlife"	Taking of the birds or their eggs is prohibited unless the	The Wildlife Act provides penalties (financial and	Department of Conservation.

Country	National Protection Status	Law protecting species	Legal protection from illegal killing, taking, trading, keeping or moving.	Penalties	Responsible Authority
	Migrant (Robertson et al. 2013)	pursuant to the *Wildlife Act 1953*.	person taking the action holds an Authority issued by the Department of Conservation.	incarceration time) for various offences relating to absolutely protected wildlife.	
Palau					
Papua New Guinea					
Philippines		*Wildlife Conservation and Protection Act of 2001* (R.A. 9147)	Illegal capture, trading, transport is prohibited.	Provisions for penalties include financial and imprisonment	Department of Environment and natural Resources
Russian Federation	Listed in Red Data Book of Birds	Yes	Yes	Yes	Ministry of Nature Resources and Ecology
Singapore	Rare passage migrant	*Parks & Trees Act, Wild Animals and Birds Act*	Yes	Penalties (financial and/or incarceration)	National Parks Board Agri-Food & Veterinary Authority of Singapore
Thailand					
Timor-Leste					
Vietnam					

5. FRAMEWORK FOR ACTION

5.1 Goal

To restore the Far Eastern Curlew's population to a positive growth rate for a period of at least three generations.

5.2 Objectives, Actions and Results

The objectives and corresponding actions and results are set out in the tables below for all threats identified for the Far Eastern Curlew in the EAAF. Tables have been listed according to ratings assigned in the risk matrix.

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

Objective 1: Protect all important habitats for Far Eastern Curlew across its range.				
Result	**Action**	**Priority**	**Time Scale**	**Organizations responsible**
1.1 All important staging and non-breeding sites along the EAAF are adequately protected and, where possible, managed .	1.1.1 Important non-breeding areas are identified Applicable to: **All Range States** that support staging and non-breeding habitat	Essential	Short	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
	1.1.2 Important non-breeding areas are adequately managed Applicable to: **All Range States** that support staging and non-breeding habitat	Essential	Medium	Government institutions in charge of nature conservation International and National conservation NGOs

	1.1.3 Important non-breeding areas are adequately protected Applicable to: **All Range States** that support staging and non-breeding habitat	Essential	Medium	Government institutions in charge of nature conservation International and National conservation NGOs
1.2 Breeding habitats are adequately protected and, where possible, managed.	1.2.1 Important breeding areas are identified Applicable to: **Russia** and **China**	Essential	Short	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
	1.2.2 Important breeding areas are adequately managed Applicable to: **Russia and China**	Essential	Medium	Government institutions in charge of nature conservation International and National conservation NGOs
	1.2.3 Important breeding areas are adequately protected Applicable to: **Russia and China**	Essential	Medium	Government institutions in charge of nature conservation International and National conservation NGOs
Objective 2: Establish a climate change response plan for Far Eastern Curlew				
2.1 The impacts of climate change on Far Eastern Curlew are buffered.	2.1.1 Quantify and predict changes to important breeding habitat Applicable to: **All Range States** that support breeding habitat	Medium	Medium	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions

	2.1.2 Quantify and predict changes to important staging and non-breeding sites Applicable to: **All Range States** that support staging and non-breeding habitat	Medium	Medium	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
	2.1.3 Validate predictions of population response to climate change against measured data Applicable to: **All Range States**	Medium	Long	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
	2.1.4 Identify potential shifts in nesting and non-breeding distribution and ensure adequate coverage of these areas in protected areas Applicable to: **All Range States** that support breeding and non-breeding habitat	Medium	Long	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
Objective 3: Ensure the legal direct take of Far Eastern Curlew is eliminated				
3.1 Far Eastern Curlew populations subject to legal direct take are protected	3.1.1 Immediately cease all forms of legal direct take of Far Eastern Curlew Applicable to: **All Range States** where legal hunting occurs.	Essential	Short	Government institutions in charge of nature conservation International and National conservation NGOs
Objective 4: Reduce, or eliminate, illegal take of Far Eastern Curlew				
4.1 The areas where the illegal take of Far Eastern Curlews	4.1.1 Identify key areas where Far Eastern Curlew illegal take occurs Applicable to: **All Range States**	Essential	Short	Government institutions in charge of nature conservation

occurs are identified				International and National conservation NGOs
	4.1.2 Strengthen legal mechanisms in areas affected by harvesting, trading and illegal use Applicable to: **All Range States**	Essential	Medium	Government institutions in charge of nature conservation.
4.2 Reduced illegal take of Far Eastern Curlew	4.2.1 Promote the enforcement of legal mechanisms to reduce illegal take Applicable to: **All Range States**	Essential	Short	Government institutions in charge of nature conservation International and National conservation NGOs
	4.2.2 Implement an educational awareness programme, which may include incentives for best practice, aimed at reducing the illegal and incidental take of Far Eastern Curlew in the EAAF Applicable to: **All Range States**	Medium	Immediate	Government institutions in charge of nature conservation International and National conservation NGOs
Objective 5: Support activities to reduce the risk and impact of chronic and acute pollution on Far Eastern Curlew in coastal foraging areas				
5.1 Reduced chronic pollution in sites of international importance	5.1.1 Work with policy and regulatory authorities to reduce levels of pollution Applicable to: **All Range States**	Medium	Medium	Government institutions in charge of nature conservation and pollution control International and National conservation NGOs Academic institutions
5.2 Monitoring programmes are in place to measure the impact of chronic	5.2.1 Monitor water quality and Far Eastern Curlew health in key coastal staging and non-breeding sites	Low	Medium	Government institutions in charge of nature conservation

pollution within coastal waters on the health of Far Eastern Curlew	Applicable to: **All Range States** that support staging and non-breeding habitat			International and National conservation NGOs Academic institutions
Objective 6: To monitor the population dynamics of Far Eastern Curlew in the EAAF to detect population responses to management implemented under this Single Species Action Plan				
6.1 Demographic data are available to allow assessment of the response of Far Eastern Curlew to anthropogenic impacts throughout the EAAF	6.1.1 Establish, or maintain long-term monitoring system of key demographic parameters following best practice guidelines Applicable to: **All Range States**	High	Medium	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
	6.1.2 Monitor numbers of birds at a statistically robust sample of staging and non-breeding sites and undertake analysis of data to improve the accuracy of the global population estimate Applicable to: **All Range States** that support staging and non-breeding habitat	Essential	Immediate	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
	6.1.3 Monitor numbers at a statistically robust sample of breeding areas in Russia and China Applicable to: **Russia and China**	Essential	Immediate	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
	6.1.4 Initiate research to accurately determine: Population structure Population trends Adult and juvenile survival Productivity Nest survival and causes of nest loss	Medium	Ongoing	Government institutions in charge of nature conservation International and National

	Chick survival Breeding density Foraging ecology and diet Applicable to: **All Range States**			conservation NGOs Academic institutions
	6.1.5 Identify through satellite tracking the migratory routes and non-breeding distributions of birds from different breeding populations, particularly while on southward migration. Applicable to: **All Range States**	Medium	Immediate	International and National conservation NGOs Academic institutions
	6.1.6 Maintain an internationally coordinated colour-marking scheme through the EAAFP Colour-marking Task Force and relevant national bird banding programmes Applicable to: **All Range States**	Medium	On-going	Government institutions in charge of nature conservation International and National conservation NGOs East Asian – Australasian Flyway Partnership
Objective 7: Assess the risk and impact of disturbance on Far Eastern Curlew				
7.1 The effect of disturbance on Far Eastern Curlew has been quantified	7.1.1 Quantify the impact of disturbance on the breeding grounds and assess the likely impact on the population Applicable to: **Russia and China**	High	Medium	Government institutions in charge of nature conservation International and National conservation NGOs Academic institutions
	7.1.2 Quantify the level of disturbance in key staging and non-breeding sites and assess the likely impact on the population Applicable to: **All Range States** that support staging and non-breeding habitat	High	Medium	Government institutions in charge of nature conservation International and National conservation NGOs

				Academic institutions
Objective 8: All Range States are actively implementing the Single Species Action Plan				
8.1 International cooperation is maximized through the full engagement of all Range States in relevant multilateral frameworks	8.1.1 Consider developing national action plans to assist in the implementation of this Single Species Action Plan Applicable to: **All Range States**	High	Immediate	Government institutions in charge of nature conservation International and National conservation NGOs
	8.1.2 Consider accession to all relevant multilateral frameworks by Range States Applicable to: **All Range States**	High	Long	Government institutions in charge of nature conservation International and National conservation NGOs
	8.1.3 Maintain the active work of the EAAFP Far Eastern Curlew Task Force to coordinate implementation of the Single Species Action Plan Applicable to: **All Range States**	Essential	Long	Government institutions in charge of nature conservation International and National conservation NGOs
	8.1.4 Hold regular meetings to exchange information and plan joint actions for the conservation of the Far Eastern Curlew Applicable to: **All Range States**	Essential	On-going	Government institutions in charge of nature conservation International and National conservation NGOs Academic Institutions
Objective 9: Raise public awareness of the Far Eastern Curlew and disseminate information material				
9.1 Use modern technologies and social media to raise	9.1.1 Prepare a brochure in Range States' languages and disseminate widely Applicable to: **All Range States**	High	Short	International and National conservation NGOs

public awareness				
9.2 Target local authorities and decision-makers on the needs of Far Eastern Curlew	9.2.1 Develop materials to raise awareness amongst local authorities responsible for approving developments at important sites identified in Action 1.1 and 1.2	High	Short	International and National conservation NGOs

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