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REPORT

HK

2014

PRIORITIZING MIGRATORY SHOREBIRDS FOR CONSERVATION

ACTION ON THE EAST ASIAN-AUSTRALASIAN FLYWAY

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Publisher: WWF-Hong Kong

Design: Jesse Conklin

Cover photograph: © Adrian Boyle. *Red Knots foraging in salt ponds in Bohai Bay, China (Luannan Coast & Saltworks; Site #91)*

FOREWORD

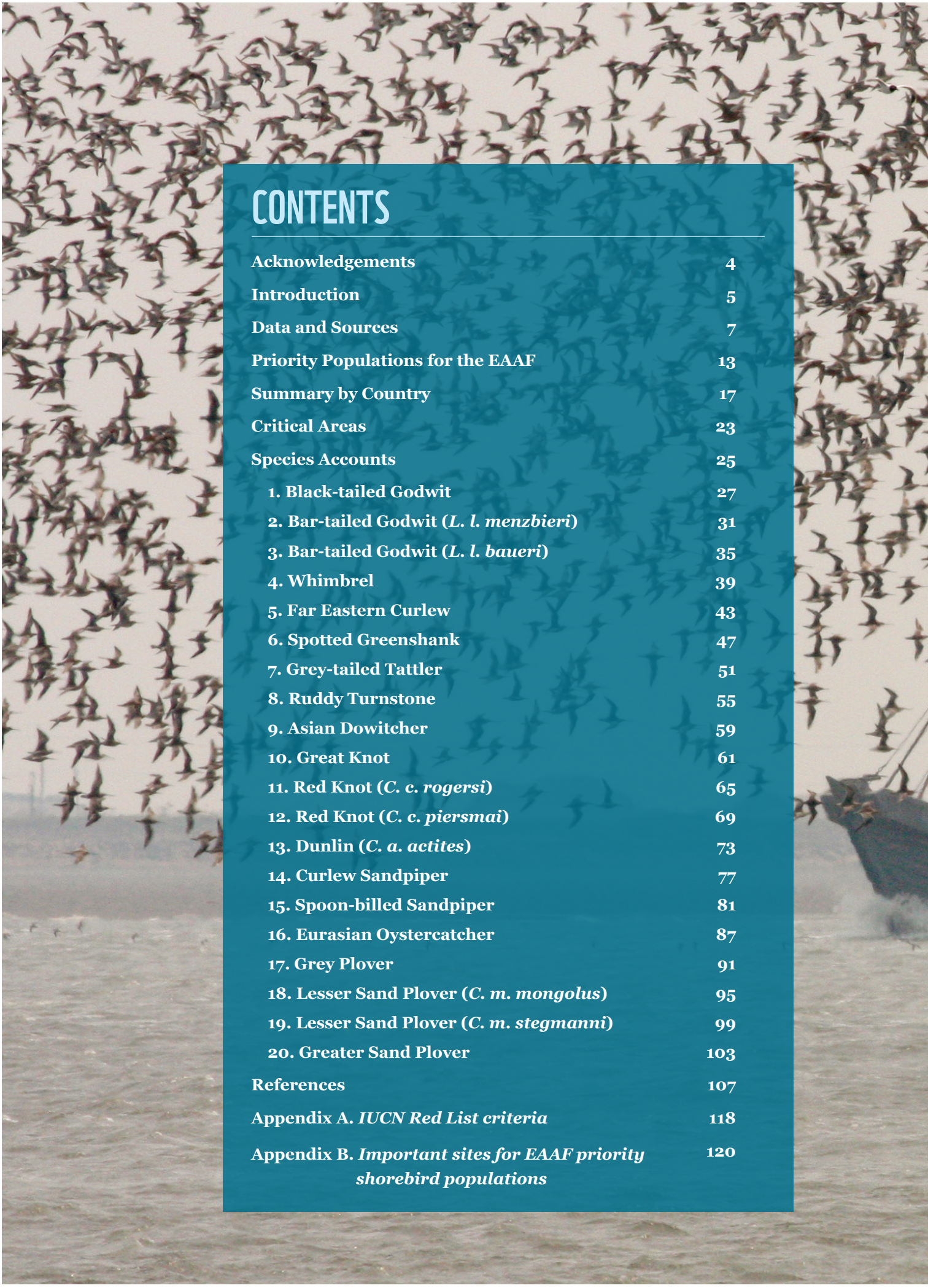
Migratory shorebirds travel some of the greatest distances of all migratory birds and those that traverse the East Asian-Australasian Flyway (EAAF) must pass through some of the most densely populated regions on the planet to reach their breeding grounds. Recent reports of major declines in shorebirds that migrate through this flyway indicate the serious effects of anthropogenic changes to the environment, which should be of major concern to governments and the international conservation community alike. Effective conservation planning is dependent on the availability of the highest quality information on the environment, including the status, distributions, and threats to these shorebird populations. It is for these reasons that this prioritization report is a fundamental and vital resource for both researchers and decision makers.

This publication is welcomed as it brings together and analyses the extensive amount of population data on shorebirds that has been collected in the flyway over many years. It has drawn on the expertise and data from a wide range of stakeholders throughout the flyway and is a testament to the many dedicated individuals and organizations who have contributed to the information used in this report.
The study also supports one of the fundamental objectives of the Shorebird Working Group of the EAAF Partnership, which is to share information and identify issues related to the understanding and conservation of shorebirds in the flyway. The report underlines the importance of supporting and strengthening these monitoring efforts and the need for effective national networks which will work to improve the quality and dependability of data collected at important waterbird sites.

This is a major contribution to the understanding of the vulnerability of shorebird species in the EAAF. The results of this study, analysed by specialists and peer-reviewed by experts across the flyway, will serve to focus awareness on what is happening to shorebirds in the EAAF by identifying relative conservation priority of species and the pressures on key regions and habitats that contribute to their decline. I commend WWF-Hong Kong for initiating, supporting, and publishing this important study. The challenge is now to utilize these data to formulate practical and effective conservation plans that will guide and encourage decision makers throughout the flyway to ensure that critical habitat is preserved and managed to ensure the future of these amazing birds.

Ken Gosbell

Chair, Shorebird Working Group of the EAAF Partnership



CONTENTS

© Jesse Conklin. *Bar-tailed Godwits at Yalujiang National Nature Reserve, Liaoning (Site #85)*

ACKNOWLEDGEMENTS

In addition to the specific contributions to this report listed below, the authors acknowledge and thank the many whose decades of hard work in the field provided the insights and count data summarized herein, and those whose previous efforts to compile and interpret such knowledge made this report possible. Chief among these are Mike Bamford, Roger Jaensch, Doug Watkins, and especially the late Mark Barter.

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INTRODUCTION
PRIORITIZING MIGRATORY SHOREBIRDS FOR CONSERVATION ACTION

This report is an initiative for regional prioritization of migratory shorebirds on the East Asian-Australasian Flyway and is intended to focus conservation efforts on shorebirds throughout the flyway.

Background

Every year 50 million migratory waterbirds migrate from southern non-breeding areas in Southeast Asia and Australasia, to northern breeding grounds, mostly in Russia, but also in China, Mongolia, Japan, the Korean peninsula, and Alaska[8,127]. The sum of these migration routes through 22 countries is defined as the East Asian-Australasian Flyway (EAAF)[36]. The EAAF is the most species-rich of the world's nine major flyways. Unfortunately, the EAAF also has the highest proportion of declining waterbird populations[65]. Waterbirds in the EAAF are in crisis.

Situational analyses of migratory waterbirds in the EAAF indicate that the main driver of these declines is reduction of the extent and quality of the primary waterbird habitats: coastal and inland wetlands. Major threats to these habitats include land claim or drainage, reduced river flow, human disturbance, intensification of aquaculture practices, and pollution. Medium-high threats include the lack of conservation management at important sites, unsustainable harvesting of shared food, climate change, hunting, and exotic invasive species[62,133,221]. The loss of coastal wetlands is currently the single greatest threat. In the Yellow Sea (including Bohai Bay), a loss of 35% of the intertidal habitat in the key areas for waterbirds since the 1980s has led to steep population declines; projected rates of on-going reclamation suggest a further 39% of those key areas will be lost by 2025[133]. The conservation status of inland wetlands in the region is less well known, but there are serious concerns about their stability and persistence as well[2,90].

Of all the threatened or Near Threatened waterbirds in the EAAF, more than 25% are shorebirds (i.e., sandpipers, plovers, snipes, and allies), while they represent about 15% of the waterbirds species in the EAAF[8,133]. Shorebirds are especially sensitive to habitat quality and habitat loss because they are top predators and their tendency to make long-distance migrations makes them dependent on limited key habitats[40].

Assessing the conservation status of shorebird species using the EAAF

This report is an initiative for regional prioritization of the status of shorebird species using the EAAF, and is an objective assessment of the conservation status of EAAF populations using the latest available data on population size, trends, and distribution (e.g., endemism and use of sites), to determine which populations are most likely to reach or approach extinction if measures are not taken. For the prioritization, criteria of the Red List of Threatened Species of the International Union of the Conservation of Nature (IUCN) were applied. IUCN has the global mandate to assess and catalogue the current status of threatened biodiversity to promote conservation. The IUCN Red List criteria and associated terminology are internationally accepted and understood. The priority list of this report is not the end product of an IUCN regulated process, and therefore this document cannot

be regarded as an official regional Red List. We however recommend that the presented regional status assessment will be used for global (re-)assessment of the status of threatened shorebird species that occur mainly in the EAAF.

The prioritization presented here relied on a vast array of primary and secondary data sources on the distribution and conservation status of shorebirds in the EAAF. Central among these was the seminal report by Bamford *et al.*, *Migratory shorebirds of the East Asian-Australasian Flyway: population estimates and internationally important sites*[8]. Although published in 2008, much of the information in that report was significantly older; recent changes along the flyway have been so drastic and widespread that constant effort is required to keep available data current and applicable. Importantly, the species prioritization process presented in this report does not include threats to habitats and also does not include values, costs, practicality, or feasibility of conservation actions. This allows an objective prioritization based on population data only.

In summary, this report constitutes an assessment of 63 populations of 52 migratory shorebird species using the EAAF. In total, 20 populations of 17 species are found to be likely to reach or approach extinction in the near future if no measures are taken. Detailed information on key threats, population status, distribution, important sites, and relevant ecology of each of the priority populations is provided in the *Species Accounts* section. In addition, a number of species which may be of future conservation concern, but do not currently warrant listing according to Red List criteria, are identified. The section *Summary by Country* reviews the distribution of the 20 priority populations in the 17 EAAF countries where they occur in internationally important numbers. The *Critical Areas* section identifies regional geographic 'hotspots' for potential conservation action, based on their importance to multiple EAAF priority shorebird populations.

Toward effective conservation action

This report is designed to stimulate and enable stakeholders in the EAAF (e.g., national governments, national/international conservation organisations, academics, and shorebird experts) to take actions that will effectively minimize further decline and loss of migratory shorebird populations in the flyway. The data presented here allow targeting of species and populations most in need, as well as the sites or regions most important to their persistence, to ensure protection at all stages of the annual cycle.

Important next steps may include: 1) identifying demographic drivers of observed population declines; 2) examining ecological function and threats to important sites; 3) promoting site management plans and official protection status (e.g., Ramsar site or Flyway Site Network designation); 4) identifying conservation strategies that may benefit multiple species; 5) promoting integrated coastal zone management and ensuring that international obligations regarding biodiversity conservation are reflected in management planning; and 6) continued monitoring of population trends, site use, and effectiveness of existing management plans. Ultimately, this process will help to ensure long-term protection and persistence of shorebirds in the flyway.

DATA AND SOURCES

Fifty-two shorebird species that are migratory within the EAAF are considered in this report.

Six of these species are represented by more than one recognized subspecies within the flyway; therefore, 63 populations in total are under consideration (see Table 1). Populations that are thought to be wholly sedentary (e.g., three subspecies of Little Ringed Plover *Charadrius dubius*) are excluded. Also, species in which the entire migration of most individuals occurs within a single country (e.g., Australian Pratincole *Stiltia isabella*) or a limited geographic region (e.g., Double-banded Plover *Charadrius bicinctus*) are not considered.

Sources

For each species, the latest available information on conservation status, population size, and population trend was compiled, both at global scale and for the portion of the species using the EAAF. For this purpose, the following sources were reviewed, and updated with more recent or complete information, including expert opinion, where appropriate:

1) Wetlands International. 2013. *Waterbird Population Estimates – Fifth Edition*[215]

2) BirdLife International. 2013. *Species factsheets: IUCN Red List for birds*[31]

3) Garnett, S., J. Szabo & G. Dutson. 2011. *Action Plan for Australian Birds 2010*[80]

4) Watkins, D., R. Jaensch, D. Rogers & K. Gosbell. 2012. *Preliminary updated estimates of population size of selected shorebird species in the East Asian-Australasian Flyway based on trends in The Action Plan for Australian Birds 2010 (Garnett et al. 2011)*[210]

5) Bamford, M., D. Watkins, W. Bancroft, G. Tischler & J. Wahl. 2008. *Migratory shorebirds of the East Asian-Australasian Flyway: population estimates and internationally important sites*[8]

6) Barter, M. 2002. *Shorebirds of the Yellow Sea: importance, threats and conservation status*[15]

Data Summary

For a summary of species and population information, see Table 1.

Of 52 shorebird species considered in this report, the global populations of 16 are confined to the EAAF. Seven species appear on the IUCN global Red List (Critically Endangered = 1 species, Endangered = 1, Vulnerable = 2, Near Threatened = 3); five of these species are endemic to the EAAF. The global populations of 29 species are considered to be declining, 11 are stable, 10 are unknown, and only two are thought to be increasing.

At the scale of the flyway, 32 of 63 populations (51%) are endemic to the EAAF. Of 25 populations with known trends, 24 are declining and only one is increasing (Black-winged Stilt *Himantopus himantopus*). For most populations (60%), the population trend is unknown. Thirty-eight populations primarily use coastal habitats outside the breeding season (17 are considered coastal obligates), whereas 24 use primarily non-coastal habitats and one is pelagic (Red-necked Phalarope). In 13 populations, more than 50% of individuals are thought to depend upon coastal habitats in the Yellow Sea region (for this report, 'Yellow Sea' is meant to include Bohai Bay) at some stage in the annual cycle.

Data Limitations

Various factors influence the dependability and comparability of the data used for this analysis:

1) Many population estimates are not current. For some species, recent data has not yet been analysed for updates of Waterbird Population Estimates (WPE), or no new data are available to revise estimates that may be 10–20 years old.

2) Many population estimates are extremely imprecise (sometimes including an order of magnitude), and some are based on expert opinion rather than census data. This is especially true for populations that: a) are difficult to distinguish in the field from other species or conspecific populations; b) are difficult to count because they do not congregate; or c) make use of cryptic habitats or unsurveyed (particularly inland) regions.

3) There are insufficient data to confidently establish population trend in most cases (38 of 63; 60%). Consequently, populations may be de-prioritized based on a lack of information rather than actual evidence that the population is not declining.

4) Some recognized declines are based simply on expected impacts on critical habitats, rather than quantified decreases in abundance.

TABLE 1

Summary data for all populations considered in this report

The species order is consistent with Bamford *et al.* 2008[8].

Key to abbreviations
IUCN Red List Status: CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern.

Population trend: DEC = declining; STA = stable; INC = increasing; UNK = insufficient data to identify population trend.

Non-breeding habitats: NC = primarily non-coastal (<50% of population found in coastal habitats); C = primarily coastal (50–99%); CO = coastal obligate (100%); P = pelagic.

* Note on taxonomic status of Kentish plover *Charadrius alexandrinus* on the EAAF: subspecies *C. a. dealbatus* has been proposed as a separate species White-faced Plover (*Charadrius dealbatus*), which would be endemic to the EAAF; this is currently unresolved[169]. The flyway estimate of 100,000 includes both populations *C. a. alexandrinus* and *dealbatus*. There is no information with which to estimate population size or trend for *C. a. dealbatus* alone.

Table 1 *Summary data for all populations.*

English Name	Species	Subspecies	Species Endemic to EAAF	Subspecies Endemic to EAAF	IUCN Red List Status (Global)	Global Population Estimate	Global Population Trend	EAAF Population Estimate	EAAF Population Trend	Estimated % of EAAF Population Using Coastal Habitats of the Yellow Sea	Non-breeding Habitats
Common Snipe	*Gallinago gallinago*	*gallinago*			LC	6,270,000–8,070,000	DEC	100,000–1,000,000	UNK	0%	NC
Latham's Snipe	*Gallinago hardwickii*		x	x	LC	25,000–100,000	DEC	25,000–100,000	DEC	0%	NC
Swinhoe's Snipe	*Gallinago megala*		x	x	LC	25,000–100,000	UNK	25,000–100,000	UNK	0%	NC
Solitary Snipe	*Gallinago solitaria*				LC	10,000–110,000	STA	10,000–110,000			
		japonica		x				1,000–10,000	UNK	0%	NC
		solitaria				10,000–110,000	UNK	10,000–100,000	UNK	0%	NC
Pintail Snipe	*Gallinago stenura*				LC	50,000–2,000,000	UNK	25,000–1,000,000	UNK	1–20%	NC
Eurasian Woodcock	*Scolopax rusticola*				LC	10,025,000–25,025,000	STA	25,000–1,000,000	UNK	1–20%	NC
Black-tailed Godwit	*Limosa limosa*	*melanuroides*		x	NT	540,000–730,000	DEC	139,000	DEC	20–50%	C
Bar-tailed Godwit	*Limosa lapponica*				LC	1,099,000–1,149,000	DEC	279,000			
		menzbieri		x				146,000	DEC	>80%	CO
		baueri		x				133,000	DEC	>80%	CO
Little Curlew	*Numenius minutus*		x	x	LC	180,000	STA	180,000	UNK	1–20%	NC

Table continues

Table 1 *Summary data for all populations, continued.*

Whimbrel	*Numenius phaeopus*	*variegatus*		x	LC	962,000–2,087,000	DEC	55,000	DEC	20–50%	CO
Eurasian Curlew	*Numenius arquata*	*orientalis*			NT	795,000–1,260,000	DEC	100,000	UNK	>80%	C
Far Eastern Curlew	*Numenius madagascariensis*		x	x	VU	32,000	DEC	32,000	DEC	50–80%	CO
Spotted Redshank	*Tringa erythropus*				LC	105,000–345,000	STA	25,000	UNK	1–20%	NC
Common Redshank	*Tringa totanus*				LC	963,000–2,649,000	UNK	75,000		1–20%	
		ussuriensis				25,000–100,000	UNK	UNK	UNK		C
		terrignotae		x				10,000–100,000	UNK		C
		craggi		x				10,000–100,000	UNK		C
Marsh Sandpiper	*Tringa stagnatilis*				LC	264,000–1,240,000	DEC	100,000–1,000,000	UNK	1–20%	C
Common Greenshank	*Tringa nebularia*				LC	440,000–1,470,000	STA	100,000	UNK	1–20%	C
Spotted Greenshank	*Tringa guttifer*		x	x	EN	1,200	DEC	1,200	DEC	20–50%	CO
Green Sandpiper	*Tringa ochropus*				LC	1,150,000–3,990,000	STA	25,000–100,000	UNK	1–20%	NC
Wood Sandpiper	*Tringa glareola*				LC	3,100,000–3,500,000	STA	100,000	UNK	1–20%	NC
Terek Sandpiper	*Xenus cinereus*				LC	160,000–1,150,000	STA	50,000	UNK	20–50%	CO
Common Sandpiper	*Actitis hypoleucos*				LC	2,600,000–3,150,000	DEC	50,000	UNK	1–20%	NC
Grey-tailed Tattler	*Heteroscelus brevipes*		x	x	LC	44,000	DEC	44,000	DEC	1–20%	CO
Ruddy Turnstone	*Arenaria interpres*	*interpres*			LC	475,000–713,000	DEC	28,500	DEC	1–20%	CO
Asian Dowitcher	*Limnodromus semipalmatus*		x	x	NT	23,000	DEC	23,000	DEC	1–20%	CO
Great Knot	*Calidris tenuirostris*		x	x	VU	290,000	DEC	290,000	DEC	>80%	CO

Table continues

Table 1 *Summary data for all populations, continued.*

Red Knot	*Calidris canutus*				LC	1,010,000–1,030,000	DEC	105,000				
		rogersi	x					50,500–62,000	DEC	>80%	CO	
		piersmai	x					48,500–60,000	DEC	>80%	CO	
Sanderling	*Calidris alba*				LC	620,000–695,000	UNK	22,000	UNK	20–50%	CO	
Red-necked Stint	*Calidris ruficollis*		x	x	LC	315,000	UNK	315,000	UNK	1–20%	C	
Long-toed Stint	*Calidris subminuta*				LC	25,000	UNK	25,000	UNK	1–20%	NC	
Temminck's Stint	*Calidris temminckii*				LC	189,000–1,280,000	UNK	10,000–100,000	UNK	1–20%	NC	
Sharp-tailed Sandpiper	*Calidris acuminata*		x	x	LC	160,000	STA	160,000	UNK	1–20%	C	
Dunlin	*Calidris alpina*				LC	4,643,200–6,491,000	DEC	650,000		>80%		
		sakhalina		x				100,000–1,000,000	UNK	UNK	C	
		actites		x				900	UNK	UNK	C	
		kistchinskii		x				100,000–1,000,000	UNK	UNK	C	
		arcticola		x				304,000–696,000	DEC	>80%	CO	
Curlew Sandpiper	*Calidris ferruginea*				LC	1,735,000–1,835,000	INC	135,000	DEC	20–50%	C	
Spoon-billed Sandpiper	*Eurynorhynchus pygmeus*		x	x	CR	140–480	DEC	140–480	DEC	50–80%	CO	
Broad-billed Sandpiper	*Limicola falcinellus*	*sibirica*			LC	86,000–89,000	DEC	25,000	UNK	1–20%	NC	
Red-necked Phalarope	*Phalaropus lobatus*				LC	3,600,000–4,500,000	DEC	100,000–1,000,000	DEC	1–20%	P	
Greater Painted Snipe	*Rostratula benghalensis*				LC	35,000–1,025,000	DEC	10,000–25,000	UNK	0%	NC	
Pheasant-tailed Jacana	*Hydrophasianus chirurgus*				LC	100,000–150,000	DEC	25,000–100,000	DEC	0%	NC	

Table continues

Table 1 *Summary data for all populations, continued.*

Eurasian Oystercatcher	*Haematopus ostralegus*	*osculans*		x	LC	1,130,000–1,230,000	DEC	11,000	UNK	50–80%	CO
Black-winged Stilt	*Himantopus himantopus*	*himantopus*			LC	446,000–777,000	INC	25,000–100,000	INC	1–20%	NC
Pied Avocet	*Recurvirostra avosetta*				LC	210,000–460,000	UNK	100,000	UNK	1–20%	C
Pacific Golden Plover	*Pluvialis fulva*				LC	190,000–250,000	DEC	100,000	UNK	0%	C
Grey Plover	*Pluvialis squatarola*	*squatarola*			LC	671,000	DEC	104,000	DEC	50–80%	CO
Little Ringed Plover	*Charadrius dubius*	*curonicus*			LC	275,000–525,000	STA	25,000	UNK	20–50%	NC
Kentish Plover	*Charadrius alexandrinus*	*alexandrinus, dealbatus**			LC	305,200–457,200	DEC	100,000	UNK	50–80%	C
Lesser Sand Plover	*Charadrius mongolus*				LC	288,000–368,000	DEC	108,500		1–20%	
		mongolus		x				25,500	DEC	UNK	C
		atrifrons				120,000–150,000	UNK	40,000	UNK	0%	C
		schaeferi				30,000	UNK	30,000	UNK	0%	C
		stegmanni		x				13,000	DEC	UNK	C
Greater Sand Plover	*Charadrius leschenaultii*	*leschenaultii*			LC	164,000–339,000	DEC	79,000	DEC	1–20%	C
Long-billed Plover	*Charadrius placidus*		x	x	LC	<10,000–25,000	DEC	<10,000–25,000	DEC	0%	NC
Oriental Plover	*Charadrius veredus*		x	x	LC	150,000	UNK	145,000–155,000	UNK	1–20%	NC
Grey-headed Lapwing	*Vanellus cinereus*		x	x	LC	25,000–100,000	DEC	25,000–100,000	DEC	1–20%	NC
Northern Lapwing	*Vanellus vanellus*				LC	5,200,000–10,000,000	DEC	100,000–1,000,000	UNK	1–20%	NC
Oriental Pratincole	*Glareola maldivarum*		x	x	LC	2,890,000–2,980,000	UNK	2,880,000	UNK	0%	NC

PRIORITY POPULATIONS FOR THE EAAF

We applied the IUCN Red List criteria at the regional scale to rank the conservation priority of migratory shorebird populations.

The IUCN Red List criteria are a threshold-based method to classify populations into priority categories based on their degree of perceived extinction risk (see *Appendix A*). This well-established and internationally recognized system was originally designed to assess the extinction risk of species of any taxonomic group at the global scale, but IUCN has published guidelines for its application to smaller geographical areas:

1) *IUCN Red List Categories and Criteria; Version 3.1, Second edition*[106]

2) *Guidelines for Application of IUCN Red List Criteria at Regional and National Levels; Version 4.0*[107]

To date, there has been no formal publication of a regional Red List for the EAAF, nor is this report intended to serve that function. However, there is a recently published assessment against Red List criteria for avian populations occurring in Australia:

Garnett, S., J. Szabo & G. Dutson. 2011. *Action Plan for Australian Birds 2010*[80].

As Australia comprises a significant portion of the non-breeding range for many shorebirds in the EAAF, this means that many of the populations considered in this report have already been assessed using Red List criteria, but at a national level only, using essentially the same data available here.

Briefly, the Red List criteria involve assessing a population against a number of arbitrary thresholds (*Appendix A*), with regard to population trend (criteria A/C), size (C/D), extent of geographic range (B), and explicit probability of extinction (E). For each criterion, the population is assessed against thresholds indicating Vulnerable, Endangered, and Critically Endangered status; the status of Near Threatened is available for populations that do not currently meet thresholds for Vulnerable, but are expected to in the near future if current conditions persist. The population is assigned the highest status indicated by any single criterion. For this exercise, criteria A, C, and D are explicitly evaluated. Criterion B (geographic range) was clearly designed with sedentary organisms in mind; by definition, migratory birds do not have restricted ranges by these standards. Criterion E could not be evaluated, because no formal population viability analysis has been performed for any of the populations in the EAAF.

Results

According to IUCN Red List criteria, 20 populations of 17 species qualified for Near Threatened status or higher, based on information from the EAAF (Table 2). One qualified for Critically Endangered (Spoon-billed Sandpiper), three for Endangered, eight for Vulnerable, and eight for Near Threatened status. Detailed justifications for recommended status of each population can be found in the *Species Accounts*.

Of the 20 prioritized populations, 15 are members of Family Scolopacidae (sandpipers and allies), four are Family Charadriidae (plovers), and one is Family Haematopodidae (oystercatchers). Eight represent species endemic to the EAAF; eight others represent flyway-endemic populations of species with wider global distributions. All 20 priority populations use primarily coastal habitats outside the breeding season, and 14 are considered coastal obligate. All 20 populations use intertidal mudflats to some extent outside the breeding season, and this is the primary non-breeding and migratory foraging habitat for 14 populations. For nine populations, intertidal habitats of the Yellow Sea region support 50–100% of the population during migratory periods (one of these, Eurasian Oystercatcher, makes significant use of the Yellow Sea for the entire year); 20–50% of at least four other priority populations use the Yellow Sea during migration.

Eight additional EAAF populations deserve mention as a separate group of potential conservation concern (Table 3). Six of these populations are known or suspected to be declining in the EAAF, but do not currently qualify for regional Red List status because insufficient data exist to confirm either the existence or the severity of the decline. Although the trend is currently unknown for Solitary Snipe *G. s. japonica*, its small population is a reason for concern; the current estimate includes an order of magnitude of uncertainty, but the low end of this range would qualify for Vulnerable status under criterion D (<1,000 mature individuals). Additionally, Eurasian Curlew is unique in having recognized declines and official Red List status (Near Threatened) at the global scale, but no evidence supporting a decline in the EAAF population specifically. With the accumulation of more relevant data, these eight populations (five of which are endemic to the flyway) could qualify for inclusion on the regional Red List in the near future.

TABLE 2

Status and critical data for 20 EAAF priority populations

Populations are ordered according to regional conservation priority.

Key to abbreviations
IUCN Red List Status: CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern.

Population threshold figures refer to minimum number of individuals required to identify internationally important sites (1.0% of flyway population; as recognized under the Ramsar Convention on Wetlands, 1971) and important staging sites during migration (0.25%; as proposed by Bamford *et al.* 2008[8] and applied under the Asia-Pacific Migratory Waterbird Conservation Strategy).

Table 2 *Status and critical data for priority populations.*

Species Account #	English Name	Species	Subspecies	Population Endemic to EAAF	IUCN Red List Status (Global)	Regional Red List Criteria	EAAF Population Estimate	EAAF 1.0 % Flyway Population Threshold	EAAF 0.25 % Staging Threshold
15	Spoon-billed Sandpiper	*Eurynorhynchus pygmeus*		x	**CR**	**CR**	140–480	1	1
6	Spotted Greenshank	*Tringa guttifer*		x	**EN**	**EN**	1,200	12	3
18	Lesser Sand Plover	*Charadrius mongolus*	*mongolus*	x	LC	**EN**	25,500	255	64
19	Lesser Sand Plover	*Charadrius mongolus*	*stegmanni*	x	LC	**EN**	13,000	130	33
10	Great Knot	*Calidris tenuirostris*		x	**VU**	**VU**	290,000	2,900	725
2	Bar-tailed Godwit	*Limosa lapponica*	*menzbieri*	x	LC	**VU**	146,000	1,460	365
3	Bar-tailed Godwit	*Limosa lapponica*	*baueri*	x	LC	**VU**	133,000	1,330	333
11	Red Knot	*Calidris canutus*	*rogersi*	x	LC	**VU**	50,500–62,000	505	126
12	Red Knot	*Calidris canutus*	*piersmai*	x	LC	**VU**	48,500–60,000	485	121
13	Dunlin	*Calidris alpina*	*actites*	x	LC	**VU**	900	9	2
14	Curlew Sandpiper	*Calidris ferruginea*			LC	**VU**	135,000	1,350	338
20	Greater Sand Plover	*Charadrius leschenaultii*	*leschenaultii*		LC	**VU**	79,000	790	198
5	Far Eastern Curlew	*Numenius madagascariensis*		x	**VU**	**NT**	32,000	320	80
1	Black-tailed Godwit	*Limosa limosa*	*melanuroides*	x	**NT**	**NT**	139,000	1,390	348
9	Asian Dowitcher	*Limnodromus semipalmatus*		x	**NT**	**NT**	23,000	230	58
4	Whimbrel	*Numenius phaeopus*	*variegatus*	x	LC	**NT**	55,000	550	138
7	Grey-tailed Tattler	*Heteroscelus brevipes*		x	LC	**NT**	44,000	440	110
8	Ruddy Turnstone	*Arenaria interpres*	*interpres*		LC	**NT**	28,500	285	71
16	Eurasian Oystercatcher	*Haematopus ostralegus*	*osculans*	x	LC	**NT**	11,000	110	28
17	Grey Plover	*Pluvialis squatarola*	*squatarola*		LC	**NT**	104,000	1,040	260

TABLE 3

Other populations of potential conservation concern

Abbreviations are as explained in Table 2.

English Name	Species	Subsp.	Population Endemic to EAAF	IUCN Red List Status (Global)	Regional Red List Criteria	EAAF Population Estimate	EAAF Population Trend	Justification for Regional Least Concern Status
Latham's Snipe	*Gallinago hardwickii*		x	LC	LC	25,000–100,000	DEC	Unquantified decline
Solitary Snipe	*Gallinago solitaria*	*japonica*	x	LC	LC	1,000–10,000	UNK	Unknown trend; imprecise population estimate
Eurasian Curlew	*Numenius arquata*	*orientalis*		**NT**	LC	100,000	UNK	Unknown trend
Dunlin	*Calidris alpina*	*arcticola*	x	LC	LC	304,000–696,000	DEC	Unquantified decline; very large population
Red-necked Phalarope	*Phalaropus lobatus*			LC	LC	100,000–1,000,000	DEC	Unquantified decline; very large population
Pheasant-tailed Jacana	*Hydrophasianus chirurgus*			LC	LC	25,000–100,000	DEC	Unquantified decline
Long-billed Plover	*Charadrius placidus*		x	LC	LC	<10,000–25,000	DEC	Unquantified decline
Grey-headed Lapwing	*Vanellus cinereus*		x	LC	LC	25,000–100,000	DEC	Unquantified decline

SUMMARY BY COUNTRY

For the 20 populations of migratory shorebirds in the East Asian-Australasian Flyway that are prioritized for conservation action, the sites of international importance were identified.

Where do the priority populations occur?

This section summarizes the distribution of the priority populations in the East Asian-Australasian Flyway. Considering data from all countries and territories in the flyway, information is given for 17 countries where the 20 priority populations occur in internationally important numbers. The Ramsar Convention on Wetlands (1971) defines internationally important numbers as ≥1.0% of the total flyway population. The Asia-Pacific Migratory Waterbird Conservation Strategy additionally recognizes migratory staging sites that support ≥0.25% of the flyway population as internationally important. By these criteria, sites of international importance were identified using count data from a variety of sources including the International Waterbird Counts database, published data in peer reviewed journals, respected ornithologists in each country, and key publications (e.g., Bamford *et al.* 2008[8]). Important sites identified for each priority population are shown in the *Species Accounts*; a complete listing of 354 important sites (327 confirmed and 27 potential sites; see below) and their locations are provided in *Appendix B*.

Four species have multiple populations in the flyway that cannot always be distinguished during a census count (Bar-tailed Godwit, Dunlin, Lesser Sand Plover, and Red Knot). For the populations of these four species, confirmed and potential sites are defined. Confirmed sites are based on counts where the populations could be distinguished. Where populations could not be or were not distinguished, potential sites are cautiously assigned to a population, using known ecology and migration routes for the population. In two cases (Bar-tailed Godwit *L. l. baueri* and Dunlin *C. a. actites*), the number of potential sites shown in Tables 4–6 consequently does not match the number of 'unknown population' sites shown in the *Species Accounts*; sites that were removed from consideration due to low likelihood of use by a particular population are indicated in these *Species Accounts*.

The summary information on site use is presented in three tables. First, for each priority population, the number of sites of international importance is tabulated per country, summing up to the total number of confirmed and potential sites of international importance for each population (Table 4). Second, for each country, the number of priority populations and the number of confirmed and potential sites of international importance is given (Table 5). Finally, for the entire flyway, a list of sites is presented that are used by five or more priority populations that locally meet the 1.0% threshold or the 0.25% staging threshold for international importance (Table 6).

It should be noted that the count data summarized in this report pertains almost entirely to the non-breeding and migratory periods, because most populations are sparsely distributed in Arctic and subarctic regions during the breeding season, a situation which is not well suited to a site-based analysis. In fact, Russia encompasses most or all of the breeding range for 16 of 20 priority populations in the EAAF[122], and therefore naturally supports internationally important numbers of more populations than are indicated in Tables 4–6, if the entire annual cycle is considered.

TABLE 4

Distributions of 20 EAAF priority populations by country

Distribution of sites of international importance for each of the 20 priority populations, across 17 countries in the East Asian-Australasian Flyway. Figures in parentheses represent additional sites used in potentially important numbers, based on an interpretation of 'unknown population' counts in that country, using known ecology and migration routes for the population (see text). The last column gives, for each population, the total number of confirmed and potential (in parentheses) sites of international importance in the flyway.

Country codes: AUS = Australia; BGD = Bangladesh; CHN = China; IDN = Indonesia; JPN = Japan; KHM = Cambodia; KOR = South Korea; MMR = Myanmar; MYS = Malaysia; NZL = New Zealand; PHL = Philippines; PNG = Papua New Guinea; PRK = North Korea; RUS = Russia; THA = Thailand; USA = United States of America; VNM = Vietnam

The countries of the EAAF where internationally important sites for priority shorebird populations are identified

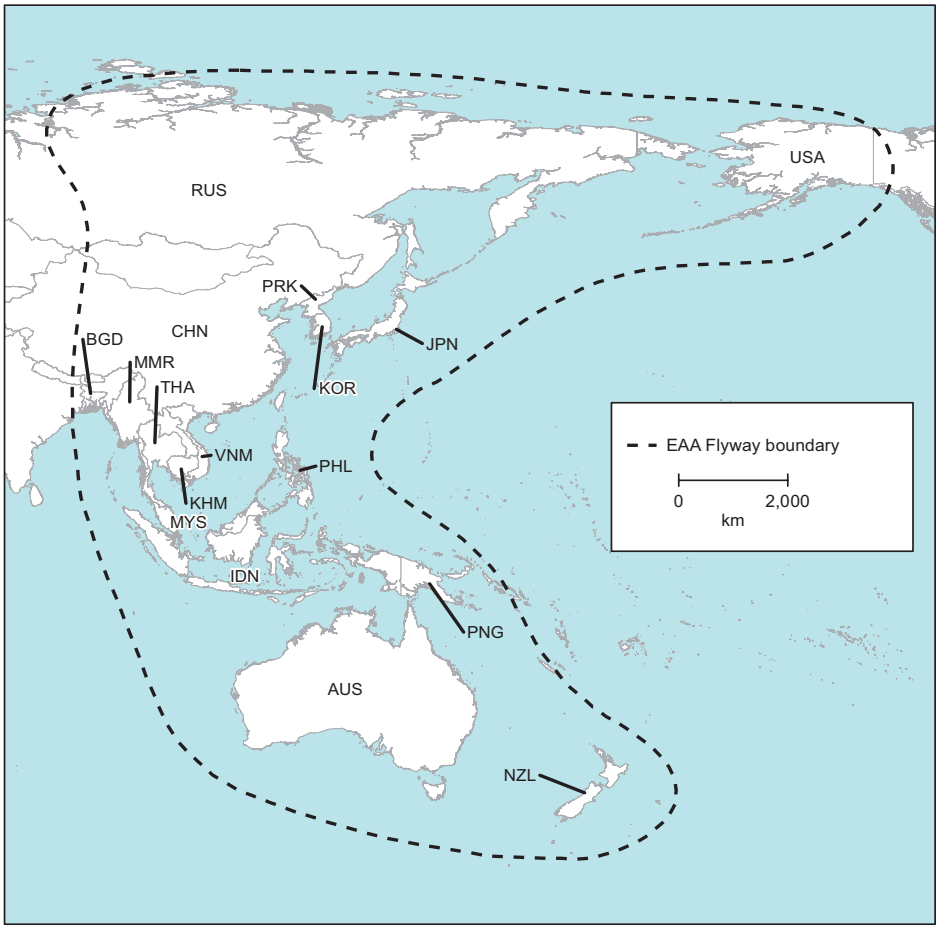


Table 4 *Number of internationally important sites for 20 EAAF priority populations by country.*

Species	Country																	
	AUS	BGD	CHN	IDN	JPN	KHM	KOR	MMR	MYS	NZL	PHL	PNG	PRK	RUS	THA	USA	VNM	Total
Black-tailed Godwit	14		12	4			14	1	2					6	1		2	56
Bar-tailed Godwit (*L. l. menzbieri*)	4 (2)		(16)	(1)	(2)		(13)		(1)					(1)				4 (36)
Bar-tailed Godwit (*L. l. baueri*)	6 (2)		(16)		(2)		(13)			19			1	(1)		5		31 (34)
Whimbrel	7		11	3	38		13	2	8					5	1			88
Far Eastern Curlew	19		14	2	5		9		3			2	1	1				56
Spotted Greenshank		4	7	3	1	1	12		4					4	4		2	42
Grey-tailed Tattler	17		3		41		4				3			1			1	70
Ruddy Turnstone	17	1	6	1	25		5			8				3		2	1	69
Asian Dowitcher	1		7	4					2						1			15
Great Knot	11		11		1		10		2					4	1			40
Red Knot (*C. c. rogersi*)	2 (3)		1 (9)	(1)			(3)		(1)	11				(2)				14 (19)
Red Knot (*C. c. piersmai*)	3 (3)		1 (9)	(1)			(3)		(1)					(2)	1			5 (19)
Dunlin (*C. a. actites*)			(31)		(8)		(9)							(3)				0 (51)
Curlew Sandpiper	25	1	8	2				1	1		1				1			40
Spoon-billed Sandpiper		3	41		31		10	1	2					9	1		6	104
Eurasian Oystercatcher			14		5		5							1				25
Grey Plover	6		19		5		9		1									40
Lesser Sand Plover (*C. m. mongolus*)	(6)		(17)	(2)			(14)				(2)			(2)				0 (43)
Lesser Sand Plover (*C. m. stegmanni*)	(6)		(17)	(2)	20		(14)				(2)			(2)				20 (43)
Greater Sand Plover	7	1	5	2				2	6		2	1			1		1	28

TABLE 5

Number of important sites and priority populations by country

Total number of sites of international importance for priority shorebird populations identified in 17 countries in the East Asian-Australasian Flyway, and the number of priority populations supported by those sites.

The additional number of potential important sites and priority populations is based on an interpretation of 'unknown population' counts in that country using known ecology and migration routes for the subspecies (see text).

Country	No. of important sites	No. of priority populations supported in internationally important numbers	Additional no. of (a) important sites and (b) priority populations supported in potentially important numbers (a)	(b)
Japan	82	10		3
China	66	15	16	5
Australia	61	14	4	2
South Korea	25	10	3	7
Russia	21	9	4	7
New Zealand	19	3		
Malaysia	12	10		3
Indonesia	9	8		5
Vietnam	7	6		
USA	6	2		
Bangladesh	5	5		
Thailand	4	9		
Myanmar	3	5		
Philippines	3	3		2
Papua New Guinea	2	2		
Cambodia	1	1		
North Korea	1	2		

TABLE 6

Most important sites for EAAF priority populations

Sites in the East Asian-Australasian Flyway supporting ≥25% of the 20 priority populations in internationally important numbers (1% threshold or 0.25% staging threshold). 'Potential' populations refer to those that may occur at the site based on 'unknown population' counts, but are not confirmed because subspecies of Bar-tailed Godwit, Dunlin, Red Knot, or Lesser Sand Plover were not distinguished. Table includes all sites supporting five or more confirmed and potential priority populations combined. Sites are ranked by highest number of priority populations present at any time of year (non-breeding, migration, and breeding combined). Site codes correspond with those used in the *Species Accounts* and *Appendix B*.

Site	Country	Name	No. of priority species supported in internationally important numbers		
			Confirmed	Potential	Total
85	China	Yalujiang National Nature Reserve, Liaoning	9	7	16
332	South Korea	Namyang Bay	9	7	16
318	South Korea	Geum River Estuary (incl. Yubu Island)	10	5	15
316	South Korea	Dongjin River Estuary	8	7	15
136	China	Tianjin Coast	7	7	14
84	China	Deep Bay (incl. Mai Po & Futian)	10	3	13
99	China	Huang He Delta Nature Reserve	8	5	13
328	South Korea	Mangyung River Estuary	8	5	13
124	China	Rudong Mudflats	8	5	13
311	South Korea	Asan Bay	6	7	13
130	China	Shuangtaizihekou National Nature Reserve	6	7	13
54	Australia	Roebuck Bay	12	0	12
337	South Korea	Yeongjong Island	7	5	12
109	China	Lianyungang Coast	5	7	12
317	South Korea	Ganghwa Tidal Flat	6	5	11
100	China	Huanghua Coast (Cangzhou)	6	5	11
57	Australia	SE Gulf of Carpentaria	8	2	10
87	China	Dongsha Shoals	5	5	10
324	South Korea	Han River Estuary	5	5	10
20	Australia	Eighty Mile Beach	9	0	9
339	Thailand	Inner Gulf of Thailand	9	0	9
170	Japan	Daijugarami	8	1	9
250	Malaysia	North-central Selangor Coast	7	2	9
154	Indonesia	Banyuasin Delta	7	2	9
165	Japan	Arao Kaigan	6	3	9
81	China	Chongming Dongtan National Nature Reserve	6	3	9
91	China	Luannan Coast & Saltworks	8	0	8
108	China	Laoting (Daqinghe – Shijiutuo)	6	2	8

Table continues

Table 6 *Most important sites for EAAF priority populations, continued.*

Site	Country	Name	No. of priority species supported in internationally important numbers		
			Confirmed	Potential	Total
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	6	2	8
334	South Korea	Songdo Tidal Flat	5	3	8
305	Russia	Schastiya Bay	3	5	8
187	Japan	Inner Tokyo Bay	6	1	7
40	Australia	Moreton Bay	5	2	7
330	South Korea	Nakdong Estuary	5	2	7
88	China	Dongtai (Zhou Gang – Qiang Gang Coast)	4	3	7
111	China	Linghekou, Jin, Liaoning	3	4	7
296	Russia	Lososei Bay	6	0	6
24	Australia	Great Sandy Strait	4	2	6
39	Australia	Milingimbi Coast	4	2	6
227	Japan	Sone Higata (Sone-Higata Tideland)	4	2	6
147	China	Yancheng Nature Reserve	4	2	6
301	Russia	Odoptu Gulf	3	3	6
2	Australia	Adele Island	5	0	5
5	Australia	Ashmore Reef	5	0	5
245	Malaysia	Bako-Buntal Bay	5	0	5
174	Japan	Furen-ko	5	0	5
25	Australia	Hunter Estuary	5	0	5
257	Myanmar	Inner Gulf of Martaban	5	0	5
60	Australia	Shoalwater Bay & Broad Sound	5	0	5
69	Bangladesh	Sonadia & Moheskhali Island	5	0	5
181	Japan	Hikawa Estuary, Shiranui	4	1	5
224	Japan	Shio-kawa Higata	4	1	5
83	China	Dandong Port East	3	2	5
248	Malaysia	Kuala Samarahan – Kuala Sadong	3	2	5
283	Philippines	Manila Bay	3	2	5
114	China	Minjiang Estuary	3	2	5
133	China	Wudi-Zhanhua-Hekou Coast, Shandong	3	2	5
335	South Korea	Suncheon Bay	3	2	5
152	China	Zhuanghe East Coast	2	3	5
310	South Korea	Aphae Island	1	4	5
105	China	Laizhou Wan	1	4	5

CRITICAL AREAS

A visualization of regional 'hotspots' of high diversity of priority shorebird populations on the EAAF.

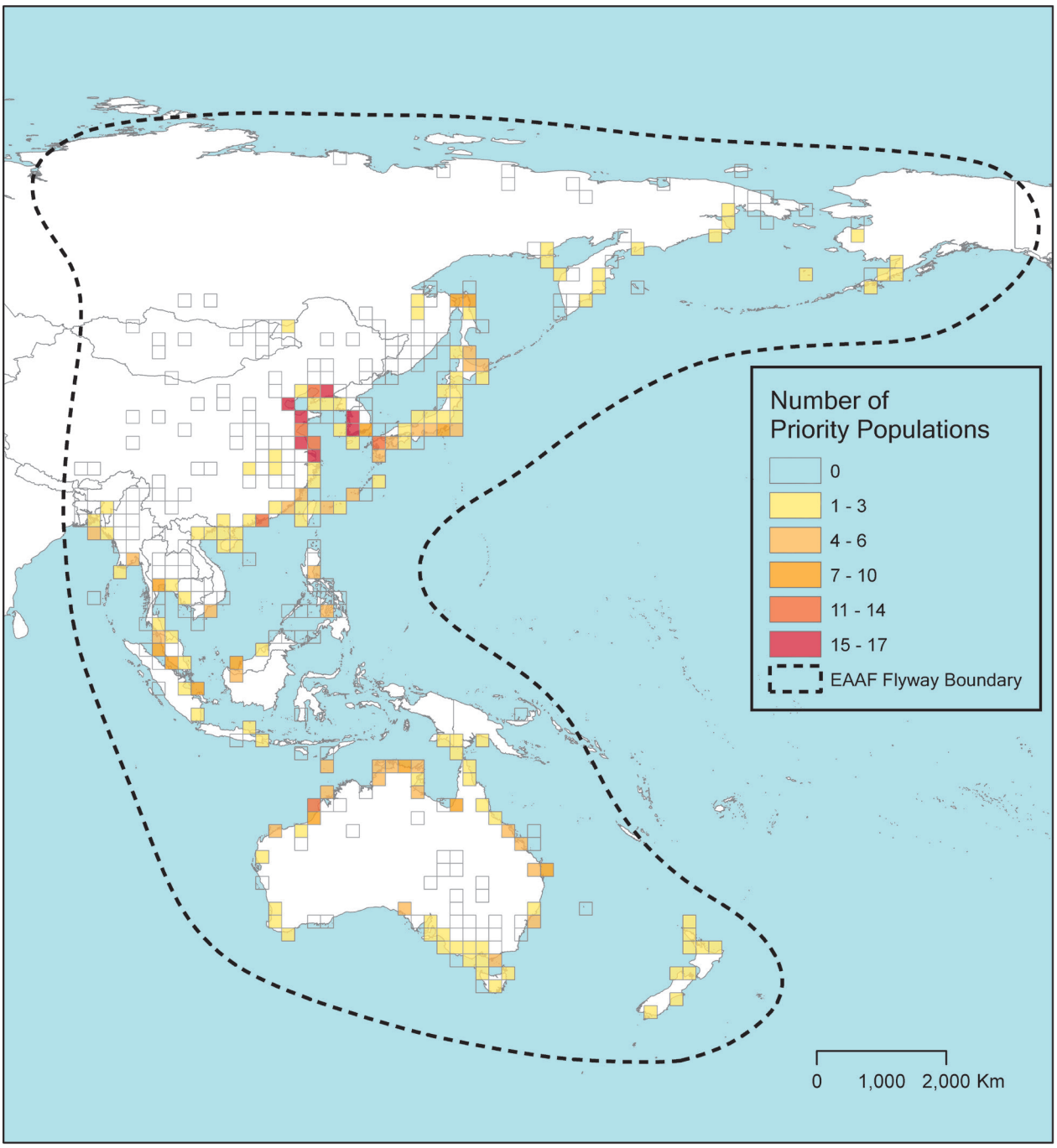
This section provides a multi-species perspective on the importance of regions of the EAAF used by priority shorebird populations, and is an alternative to a strictly site-based view. This graphic representation of geographic areas supporting the highest diversity of priority populations is intended to identify critical areas where conservation action is most likely to benefit multiple species.

A grid (1 square = 200 x 200 km at the equator) was applied to the entire flyway. Sites were assigned to grid squares based on the geographic midpoint of the site; therefore, when the spatial extent of a site spanned multiple grid squares, data from the site was included in only one grid square. For each grid square, the number of priority populations that use at least one site within the grid in internationally important numbers (1% threshold or 0.25% staging threshold) was calculated. Number of priority populations for which internationally important sites occur within each grid is indicated by color; empty grids indicate important areas for migratory waterbirds other than the 20 EAAF priority populations[113.1].

For comparison, this exercise was first performed considering only confirmed priority populations, and then again with the inclusion of potential priority populations (where counts of 'unknown' populations were cautiously assigned to a population; see the *Summary by Country* section for more details). Inclusion or exclusion of potential populations made essentially no difference to the relative importance of regions. The final map presented includes both confirmed and potential populations.

It should be noted that occurrence in internationally important numbers was the only criterion considered here. This exercise does not consider functionality of sites (e.g., for moulting, staging, etc.) or migratory connections among sites. It should not be inferred that conservation directed only at regions of the greatest shorebird diversity would be sufficient to maintain these populations.

The map indicates seven areas that support ≥15 priority shorebird populations in internationally important numbers, all of which are found along the Yellow Sea coasts of South Korea and China (including Bohai Bay). An additional three areas supporting 11–14 priority populations are also found along the Yellow Sea coast. These results reflect the region's pivotal importance as a migratory staging area for populations using a wide range of breeding and non-breeding areas. Three other areas supporting 11–14 priority populations are identified in southern Japan, southeast China, and northwest Australia. Areas supporting 4–10 priority populations are numerous in the flyway, and can be found from the Russian Sea of Okhotsk to southeast Australia, and west to Bangladesh.



Critical areas of the EAAF, based on the number of priority shorebird populations supported in internationally important numbers.

SPECIES ACCOUNTS

Critical information regarding 20 priority migratory shorebird populations in the East Asian-Australasian Flyway.

For species on the EAAF priority list, the accounts in this section provide detailed information on conservation status, distribution, and known threats within the flyway. When more than one population of a species was prioritized, an account for each population was compiled, to clearly separate information specific to a population or subspecies. The order of the accounts is consistent with Bamford *et al.* 2008[8].

Each account begins with a summary box, providing the latest flyway population estimate and trend, and the current global conservation status of the species according to the IUCN Red List. The opening paragraph then summarizes the information relevant to the population's placement on the EAAF priority list. The remaining text is organized as follows: 1) subspecific taxonomy regarding the portion of the species that uses the EAAF; 2) justification for the current population estimate and trend; 3) known geographic distribution throughout the breeding, non-breeding, and migratory periods; 4) primary habitats used throughout the annual cycle; 5) known threats to persistence of the EAAF population; and 6) critical knowledge gaps relevant to conservation of the population.

Information in the text of the accounts was assembled largely from five primary sources:

1) Birdlife International. 2013. *Species factsheets: IUCN Red List for birds*. Online at: http://www.birdlife.org/datazone/species/search[31]

2) Bamford, M., D. Watkins, W. Bancroft, G. Tischler & J. Wahl. 2008. *Migratory shorebirds of the East Asian-Australasian Flyway: population estimates and internationally important sites*[8]

3) Garnett, S., J. Szabo & G. Dutson. 2011. *Action Plan for Australian Birds 2010*[80]

4) Piersma, T., J. van Gils & P. Wiersma. 1996. *Family Scolopacidae (Sandpipers, Snipes and Phalaropes)*. Pages 444–533 in: *Handbook of the Birds of the World, Vol. 3. Hoatzin to Auks*[165]

5) Piersma, T. & P. Wiersma. 1996. *Family Charadriidae (Plovers)*. Pages 384–443 in: *Handbook of the Birds of the World, Vol. 3. Hoatzin to Auks*[166]

Unreferenced information in the account texts was derived from these five sources. Regional experts were additionally consulted to identify the most critical threats and knowledge gaps for each population. References to additional sources are included in the account texts as appropriate.

Details of possible threats are not exhaustively listed, but have been limited to major threats known or suspected to currently affect the particular population. There are additional threats that may generally affect migratory shorebirds in the EAAF, the ultimate consequences of which are difficult to predict for specific populations. Such potential threats include, but are certainly not limited to, effects of predicted sea level rise on coastal wetlands[111], changes in high-latitude tundra ecosystems related to global climate change, increased environmental contamination by pollution[133], and long-term effects of oil and natural gas exploration[39].

For each population, the map shows the known breeding (in purple), non-breeding (in orange), and year-round (in yellow; Eurasian Oystercatcher only) distributions, and the location of sites meeting either the 1.0% flyway population (larger black circles) or 0.25% staging (smaller black circles) thresholds for international importance to the population. Where count data refer to 'unknown' populations of the species, grey circles are used. The table then provides details of each of these sites, including country, name, and magnitude and date of the maximum count of individuals at that site (sites meeting only the 0.25% threshold are tinted blue in the table). Both the maps and tables represent information presented in Bamford *et al.* 2008[8], updated with more current data where available. Count records older than 35 years (as of April 2014) have been excluded . For some counts, the exact date (and in a few cases, the year) was not available; in these instances, the best estimation of the timing is shown. Appendix B provides a complete listing of important sites and their locations.

Maximum counts are provided to indicate the historical and potential relative importance of sites to the population; it should be noted that a maximum count may misrepresent numbers that regularly use a site for a number of reasons. For example, some maximum counts may far exceed the typical number of individuals at the site; available data did not allow identification of such cases. Also, many maximum counts are not recent (>15 years ago) and are unlikely to represent current or future circumstances, due to more recent changes in population size or relative site quality. For a number of sites at which there is known to have been a significant long-term decrease in the maximum number of birds using the site during the 35-year period considered here, an updated figure for the maximum number observed in more recent years (since 2004 for Spoon-billed Sandpiper; since 1999 for all other populations) is additionally provided. There are more cases for which such updated data were not currently available. Moreover, habitat changes are widespread and accelerating in the flyway, particularly in the Yellow Sea region. Therefore, even relatively recent counts may misrepresent numbers using sites that have been recently degraded or lost; sites within the reclaimed Saemangeum area in South Korea, such as the Dongjin and Mangyung River Estuaries, are notable examples, but many more sites may fall in this category.

 Mai Po in Deep Bay, Hong Kong (Site #84)

Eight of 20 priority populations, including **Asian Dowitcher**, represent species endemic to the EAAF.

BLACK-TAILED GODWIT
LIMOSA LIMOSA MELANUROIDES

EAAF population size: **139,000**
EAAF population trend: **Decline**
Global Red List status: **Near Threatened**

1

The Black-tailed Godwit has a global Red List status of Near Threatened, based on observed and predicted declines across its entire range. Despite its large population, observed declines also qualify it for **Near Threatened** status at the regional level[80]. Although threats and ecology are very well-studied in the two European subspecies, much less is known about the Black-tailed Godwit in the EAAF, where the cause of its decline is unknown[80].

Taxonomy

Three global subspecies recognized: *L. l. limosa, islandica*, and *melanuroides*. Only *L. l. melanuroides* occurs in the EAAF, where it is endemic.

Population

Size: preliminary current population estimate of 139,000[210] derived by applying observed flyway declines[80] to previous population estimate of 160,000[8].

Trend: non-breeding surveys in Australia have indicated a recent population decline of 20–29% in three generations (26 years); it is unclear whether this decline continues[80]. EAAF trends outside Australia are largely unknown, but migration counts in Japan show no clear recent trend[1].

Distribution

Breeding: disjunct range in Mongolia, northern China, Siberia, and Russian Far East.

Non-breeding: approximately 50% in Australia; the remainder in Indonesia and SE Asia (Thailand, Malaysia, Vietnam, China). In China, there is evidence of a northward expansion of the non-breeding range by at least 500 km since 1981[41].

Migration: broad-fronted on both northward and southward migrations, using both the Yellow Sea (approximately 40% of flyway population) and inland areas. Large numbers in Southeast Asia on both migrations. Large numbers observed in Kamchatka during southward migration, but much lower numbers during northward migration. Also stages in southeast Sumatra on southbound migration.

Habitat

Breeding: mostly subarctic, but Arctic in Chukotka[122]. In the Selenga Delta of Lake Baikal, uses low-land wet grasslands and sedge areas, and sandy river dunes[92]. In Kamchatka, uses wet grasslands and marshes[83]; also raised bogs and moorland, lake margins, and damp grassy depressions in steppes.

Non-breeding and migration: brackish habitats in sheltered estuaries, tidal flats, sandy beaches, saltpans, and saltmarshes. Also shores of inland lakes and other wetlands.

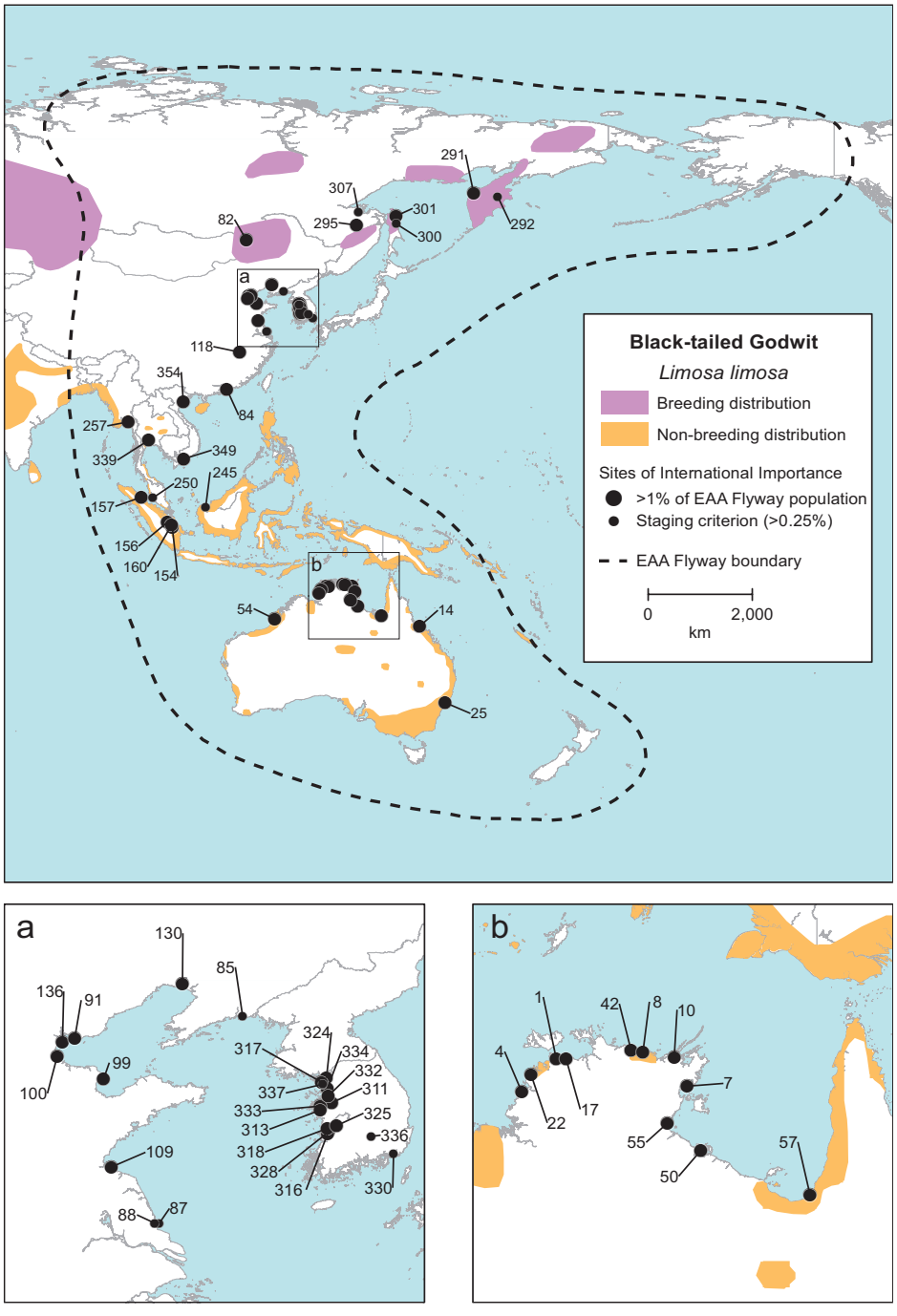
Major Threats

Destruction and degradation of intertidal staging sites in East Asia (including the Yellow Sea), through reclamation, pollution, disturbance, and reduced river flows.

Knowledge Gaps

Causes of apparent population decline in the EAAF are unknown. Although relatively well-censused in Australia, counts from rest of the non-breeding range are limited, and so a redistribution of at least part of the population cannot

Black-tailed Godwit
Range and sites of international importance. Site details on next page.



currently be ruled out. Basic ecology and life history, though well-studied in Europe, are poorly described in the EAAF. Moulting sites used by birds wintering in East/Southeast Asia unknown. Morphometrics and band recoveries suggest the possible existence of two distinct sub-populations within *L. l. melanuroides*[99]; this requires more study. Migration of birds from the western part of the breeding range, which may use primarily inland migration routes through Asia, is poorly described.

General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3003

Black-tailed Godwit *Sites of international importance (1% = 1,390; 0.25% = 348).*

Site	Country	Name	Max Count	Date	Ref.
154	Indonesia	Banyuasin Delta	30,000	04 Aug 85	*61*
57	Australia	SE Gulf of Carpentaria	26,971	01 Mar 99	*71*
311	South Korea	Asan Bay	18,282	08 May 98	*146*
301	Russia	Odoptu Gulf	15,000	14 Jul 09	*197*
118	China	Poyang Lake (incl. nearby wetlands)	13,260	Jan 11	*42*
156	Indonesia	Kuala Tungal – Tanjung Djabung Coast	12,800	31 Jul 85	*61*
136	China	Tianjin Coast	11,125	01 Apr 07	*46*
324	South Korea	Han River Estuary	10,500	01 May 00	*184*
339	Thailand	Inner Gulf of Thailand	8,439	2006–07	*192*
328	South Korea	Mangyung River Estuary	8,008	01 Sep 98	*229*
334	South Korea	Songdo Tidal Flat	7,950	2006–2010	*34*
54	Australia	Roebuck Bay	7,374	02 Dec 90	*6*
99	China	Huang He Delta Nature Reserve	7,196	18 Apr 97	*230*
		updated count	***1,350***	***01 May 10***	*46*
91	China	Luannan Coast & Saltworks	6,471	02 May 02	*17*
42	Australia	Nungbalgarri Creek	6,350	19 Feb 84	*6*
333	South Korea	Seosan	6,006	01 May 98	*229*
10	Australia	Buckingham Bay	6,000	25 Mar 92	*45*
50	Australia	Port McArthur	5,230	<2001	*44*
8	Australia	Boucat Bay	5,000	25 Mar 99	*45*
291	Russia	Khairyuzova Bay	5,000	23 Jul 83	*131*
354	Vietnam	Xuan Thuy Ramsar Site	5,000	03 May 96	*163*
109	China	Lianyungang Coast	4,425	01 Aug 12	*46*
7	Australia	Blue Mud Bay	4,000	15 Sep 96	*45*
25	Australia	Hunter Estuary	4,000	<1991	*188*
313	South Korea	Cheonsu Bay	3,935	12 May 96	*123*
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	3,780	28 Mar 02	*57*
		updated count	***1,500***	***03 Jan 09***	*108*
257	Myanmar	Inner Gulf of Martaban	3,405	Winter 2009	*232*
55	Australia	Roper River Area	3,015	<1991	*79*
317	South Korea	Ganghwa Tidal Flat	2,915	01 Sep 97	*229*
316	South Korea	Dongjin River Estuary	2,750	01 Sep 98	*15*
100	China	Huanghua Coast (Cangzhou)	2,404	01 Sep 10	*46*
84	China	Deep Bay (incl. Mai Po & Futian)	2,400	04 Apr 13	*102*
130	China	Shuangtaizihekou National Nature Reserve	2,070	07 Sep 99	*15*
		updated count	***1,750***	***14 Aug 11***	*46*
14	Australia	Cape Bowling Green	2,058	13 Dec 96	*94*
318	South Korea	Geum River Estuary (incl. Yubu Island)	2,049	06 May 98	*146*
332	South Korea	Namyang Bay	2,020	01 May 01	*229*
1	Australia	Adelaide River Floodplain	2,000	16 Jul 96	*45*
82	China	Dalai Hu National Nature Reserve	2,000	15 Apr 96	*207*
160	Indonesia	Sungai Cemara Beach	2,000	01 Mar 11	*110*
17	Australia	Chambers Bay	1,960	<2001	*44*

Table continues

Black-tailed Godwit *Sites of international importance (1% = 1,390; 0.25% = 348), continued.*

Site	Country	Name	Max Count	Date	Ref.
295	Russia	Lake Evoron	1,948	10 Aug 88	*168*
325	South Korea	Hungwun River	1,701	01 May 97	*146*
22	Australia	Fog Bay	1,700	<2004	*45*
4	Australia	Anson Bay, South	1,600	<2004	*45*
349	Vietnam	Hoa Trinh	1,600	20 Dec 00	*147*
292	Russia	Kharchinskoe Lake	1,355	23 May 99	*87*
87	China	Dongsha Shoals	1,354	01 Sep 97	*205*
250	Malaysia	North-central Selangor Coast	960	20 Mar 11	*33*
88	China	Dongtai (Zhou Gang – Qiang Gang Coast)	900	01 May 00	*15*
337	South Korea	Yeongjong Island	800	01 Sep 92	*78*
85	China	Yalujiang National Nature Reserve, Liaoning	770	17 Aug 11	*46*
307	Russia	Tugurskiy Bay	680	10 Jul 90	*168*
245	Malaysia	Bako-Buntal Bay	500	27 Oct 11	*7*
330	South Korea	Nakdong Estuary	450	01 Sep 83	*184*
336	South Korea	Wolgwang	450	01 Sep 93	*146*
300	Russia	Nabilsky Bay	400	19 Jul 86	*154*

BAR-TAILED GODWIT
LIMOSA LAPPONICA MENZBIERI

EAAF population size: **146,000**

EAAF population trend: **Strong decline**

Global Red List status: **Least Concern**

2

The Bar-tailed Godwit is currently considered a species of Least Concern according to IUCN Red List criteria[2]. However, the species is a candidate for upgrading to Near Threatened or Vulnerable status based on observed declines worldwide[133], and is proposed as a Cooperative Action Species of the Convention on Migratory Species[55]. Populations in the EAAF qualify for **Vulnerable** status at the regional level (criterion A3/4), due to substantial documented declines in the flyway, and recognition that further proposed degradation of intertidal staging habitats, particularly in the Yellow Sea, will perpetuate this decline[80].

Taxonomy

Four global subspecies recognized: *L. l. lapponica, taimyrensis, menzbieri,* and *baueri. L. l. menzbieri and baueri* are endemic to the EAAF. A small breeding population in far eastern Siberia has been proposed as a distinct subspecies (*L. l. anadyrensis*)[76,199], but its migration and non-breeding range are unknown; if this represents a third endemic population in the EAAF, it would probably qualify for regional Red List status of Vulnerable or Near Threatened based on its small population size (criterion D).

Population

Size: preliminary current population estimate of 146,000[210] derived by applying observed flyway declines[80] to previous population estimate of 170,000[8].

Trend: non-breeding surveys in Australia have indicated a population decline of 30–49% in three generations (27 years) for both *L. l. baueri* and *menzbieri*[80].

Distribution

Breeding: northern Siberia east of the Kolyma River.

Non-breeding: primarily northwest Australia, but smaller numbers in coastal southern China, Taiwan, Southeast Asia, and Indonesia. First breeding at 2–3 years of age; approximately 10% of population (mostly immature birds) remains in the non-breeding range during the breeding season[190].

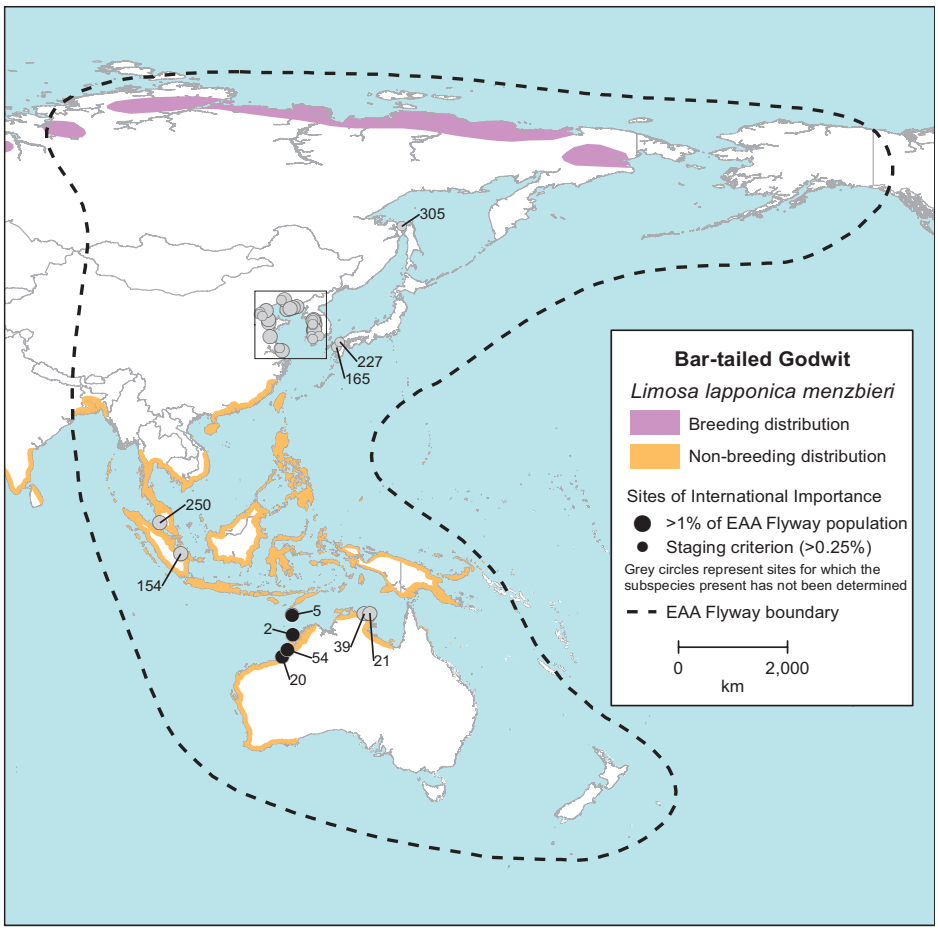
Migration: uses similar routes for northward and southward migrations. On northward migration, birds generally fly non-stop from non-breeding sites to the western and northern Yellow Sea, where they stage for more than one month[24]. Then, they fly non-stop to breeding sites in northeastern Siberia[24]. On southward migration, birds fly non-stop from New Siberian Islands to the Yellow Sea, again staging for more than a month before generally flying non-stop back to non-breeding sites[24].

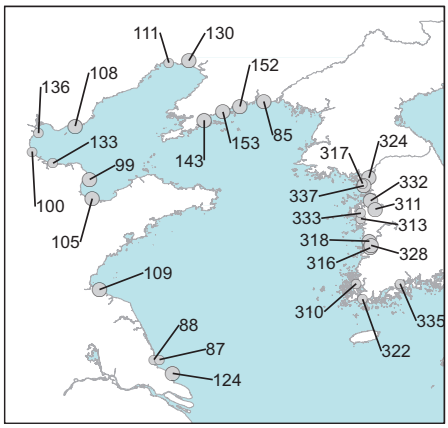
Habitat

Breeding: grassy moss and Arctic shrub (willow and birch) tundra. This subspecies characteristically uses mountain valleys and gentle slopes in addition to the southern tundra and forest tundra on plains[122].

Non-breeding and migration: tidal flats along muddy coastlines, estuaries, river deltas, inlets, mangrove-fringed lagoons, and sheltered bays.

Bar-tailed Godwit (*L. l. menzbieri*)
Range and sites of international importance. Breeding range includes L. l. anadyrensis. Site details on next page.





Major Threats

Survival analysis of birds marked in northwest Australia indicates a sharp decline in adult survival, particularly outside the non-breeding season, since 2010[167]. Threatened by loss and degradation of intertidal non-breeding and staging areas, particularly in the Yellow Sea, through reclamation, pollution, disturbance, and reduced river flows. Highly concentrated at a few major sites during both northward and southward migration.

Bar-tailed Godwit (*L. l. menzbieri*) *Sites of international importance (1% = 1,460; 0.25% = 365).*

Site	Country	Name	Max Count	Date	Ref.
20	Australia	Eighty Mile Beach	110,290	17 Oct 98	*5*
		updated count	***63,456***	***01 Nov 12***	*6*
54	Australia	Roebuck Bay	65,000	01 Jan 93	*121*
		updated count	***36,491***	***01 Nov 06***	*6*
2	Australia	Adele Island	4,819	21 Nov 04	*37*
5	Australia	Ashmore Reef	4,560	2005	*193*

Bar-tailed Godwit (unknown population) *Sites of international importance (L. l. menzbieri and baueri combined: 1% = 2,790; 0.25% = 698).*

Site	Country	Name	Max Count	Date	Ref.
85	China	Yalujiang National Nature Reserve, Liaoning	66,134	25 Apr 04	*18*
105	China	Laizhou Wan	25,961	10 May 04	*18*
143	China	Pulandian – Jinzhou East Coast, Liaoning	12,785	May 05	*19*
318	South Korea	Geum River Estuary (incl. Yubu Island)	12,479	Late Apr 06	*175*
99	China	Huang He Delta Nature Reserve	10,678	21 Apr 97	*230*
316	South Korea	Dongjin River Estuary	8,430	01 May 98	*229*
324	South Korea	Han River Estuary	8,000	01 May 00	*184*
152	China	Zhuanghe East Coast	7,700	May 05	*19*
124	China	Rudong Mudflats	7,555	Late Apr 05	*19*
39	Australia	Milingimbi Coast	7,000	15 Dec 98	*45*
154	Indonesia	Banyuasin Delta	7,000	01 Jan 96	*184*
332	South Korea	Namyang Bay	5,800	01 May 98	*229*
21	Australia	Elcho Island	5,000	25 Mar 99	*45*
109	China	Lianyungang Coast	4,702	01 Apr 13	*46*
130	China	Shuangtaizihekou National Nature Reserve	3,738	20 Apr 99	*20*
		updated count	***2,470***	***13 Aug 11***	*46*
250	Malaysia	North-central Selangor Coast	3,500	23 Mar 12	*33*
311	South Korea	Asan Bay	3,500	16 Apr 99	*146*
337	South Korea	Yeongjong Island	3,500	30 Apr 99	*15*
328	South Korea	Mangyung River Estuary	3,350	01 May 98	*229*
108	China	Laoting (Daqinghe – Shijiutuo)	3,000	14 Aug 94	*66*
153	China	Zhuanghe West Coast	2,890	May 05	*19*

Table continues

Knowledge Gaps

Poorly studied in the breeding season. More knowledge required regarding dependence on key staging sites. Precise mechanism for decreasing adult survival requires more study. Some uncertainty exists regarding the degree of spatial overlap in northern Australian non-breeding ranges of *L. l. menzbieri* and *baueri*, which complicates population estimates of the two subspecies.

General Information

http://www.birdlife.org/datazone/speciesfactsheet.php?id=3005

Bar-tailed Godwit (unknown population) *Sites of international importance (L. l. menzbieri and baueri combined: 1% = 2,790; 0.25% = 698), continued.*

Site	Country	Name	Max Count	Date	Ref.
136	China	Tianjin Coast	2,321	12 Apr 00	*17*
317	South Korea	Ganghwa Tidal Flat	2,200	01 May 98	*229*
310	South Korea	Aphae Island	2,157	01 May 98	*146*
111	China	Linghekou, Jin, Liaoning	2,045	29 Apr 99	*13*
335	South Korea	Suncheon Bay	1,868	15 Apr 98	*146*
313	South Korea	Cheonsu Bay	1,752	15 Apr 98	*146*
333	South Korea	Seosan	1,732	01 May 97	*146*
88	China	Dongtai (Zhou Gang – Qiang Gang Coast)	1,725	28 Apr 01	*16*
100	China	Huanghua Coast (Cangzhou)	1,725	01 May 10	*46*
87	China	Dongsha Shoals	1,668	01 Sep 97	*205*
133	China	Wudi-Zhanhua-Hekou Coast, Shandong	1,499	02 May 02	*17*
322	South Korea	Haenam Hwangsan	1,272	15 Apr 98	*146*
305	Russia	Schastiya Bay	953	01 Sep 02	*4*
165	Japan	Arao Kaigan	900	01 May 02	*222*
227	Japan	Sone Higata (Sone-Higata Tideland)	781	29 Apr 02	*114*

© Phil Battley. *Manawatu River Estuary, New Zealand*

The annual journey of Alaska-breeding **Bar-tailed Godwits** (*L. l. baueri*) includes three non-stop flights of 6,000–12,000 km, and requires one month of refuelling on intertidal mudflats of the Yellow Sea during northward migration. A number of other EAAF migrants, such as Red Knots, make similarly extreme non-stop flights, demonstrating how shorebirds need networks of safe and productive staging sites to support their remarkable migrations.

BAR-TAILED GODWIT
LIMOSA LAPPONICA BAUERI

EAAF population size: **133,000**

EAAF population trend: **Strong decline**

Global Red List status: **Least Concern**

3

The Bar-tailed Godwit is currently considered a species of Least Concern according to IUCN Red List criteria[2]. However, the species is a candidate for upgrading to Near Threatened or Vulnerable status based on observed declines worldwide[133], and is proposed as a Cooperative Action Species of the Convention on Migratory Species[55]. Populations in the EAAF qualify for **Vulnerable** status at the regional level (criterion A3/4), due to substantial documented declines in the flyway, and recognition that further proposed degradation of intertidal staging habitats, particularly in the Yellow Sea, will perpetuate this decline[80]. Its conservation status in New Zealand is 'At Risk, Declining'[172].

Taxonomy

Four global subspecies recognized: *L. l. lapponica, taimyrensis, menzbieri,* and *baueri. L. l. menzbieri and baueri* are endemic to the EAAF. A small breeding population in far eastern Siberia has been proposed as a distinct subspecies (*L. l. anadyrensis*)[76,199], but its migration and non-breeding range are unknown; if this represents a third endemic population in the EAAF, it would probably qualify for regional Red List status of Vulnerable or Near Threatened based on its small population size (criterion D).

Population

Size: preliminary current population estimate of 133,000[210] derived by applying observed flyway declines[80] to previous population estimate of 155,000[8].

Trend: non-breeding surveys in Australia have indicated a population decline of 30–49% in three generations (27 years) for both *L. l. baueri* and *menzbieri*[80]. Long-term count data from New Zealand suggest a similar decline in *L. l. baueri* of 18% between 1993 and 2003[190], but more recent census data do not appear to support a continuing decline in New Zealand[159]; these data await formal analysis.

Distribution

Breeding: northern and western coastal Alaska.

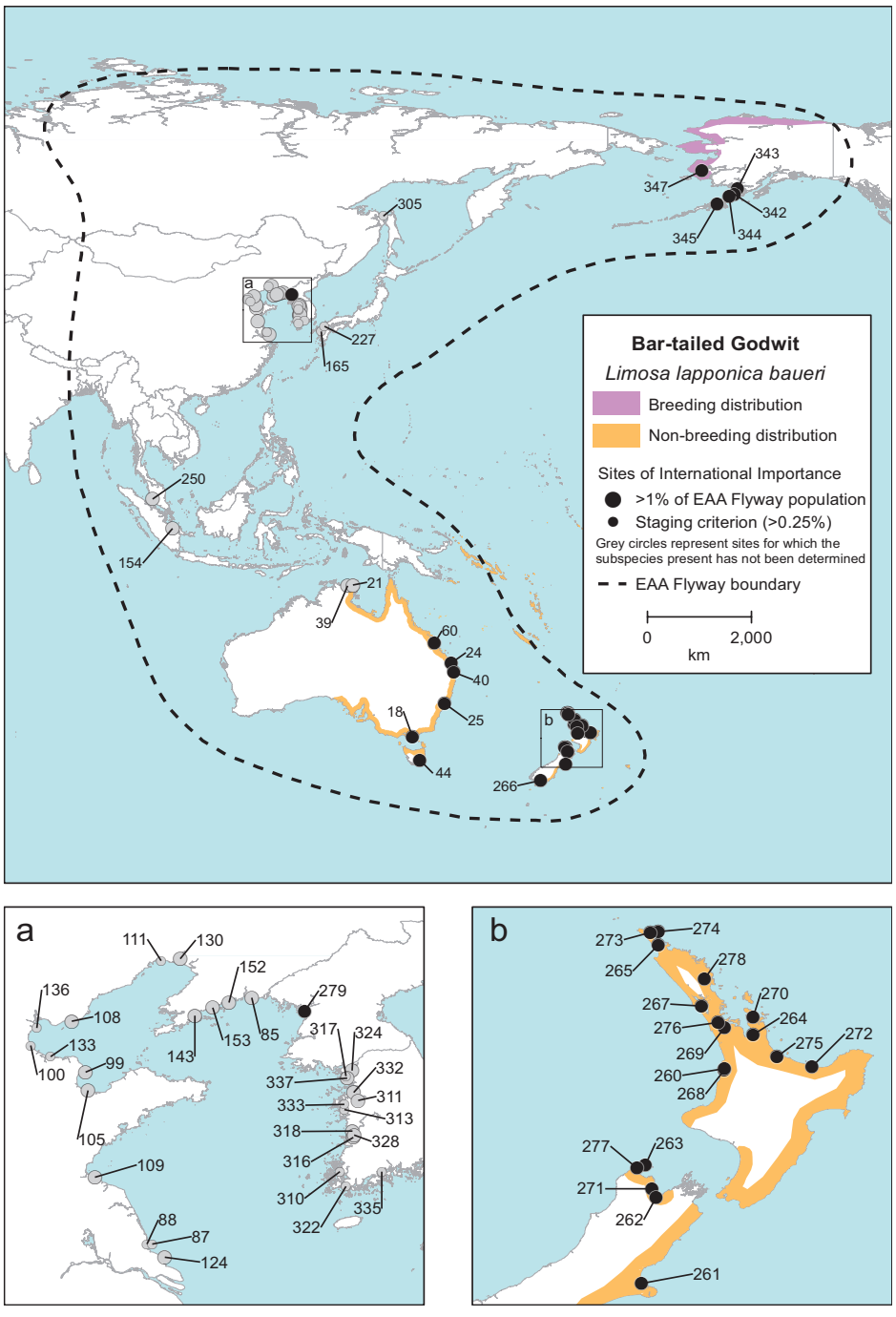
Non-breeding: approximately 60–65% in New Zealand and the remainder in eastern/northern Australia. Extremely high adult fidelity to non-breeding sites[54]. First breeding at 2–3 years of age; approximately 10% of population (mostly immature birds) remains in the non-breeding range during the breeding season[190].

Migration: Uses completely different routes for northward and southward migrations. On northward migration, birds generally fly non-stop from non-breeding sites to the Yellow Sea region, where they stage for more than one month[24]. Approximately 70% are thought to use the area around the Yalu River mouth in Liaoning, China; most of the rest are found on the Korean peninsula, with smaller numbers in Japan. Then, they fly non-stop to southwest Alaska, before dispersing to breeding sites[24]. Pre-breeding moult, initiated at non-breeding grounds, is completed at northward staging sites[53]. On southward migration, the entire population stages in southwest Alaska before flying non-stop across the Pacific Ocean to New Zealand and Australia[24].

Habitat

Breeding: grassy moss and shrub (willow and birch) tundra, in lowlands or gently sloping mountain valleys of both Arctic and subarctic zone.

Bar-tailed Godwit (*L. l. baueri*)
Range and sites of international importance. Site details on next page.



Non-breeding and migration: tidal flats along muddy coastlines, estuaries, river deltas, inlets, mangrove-fringed lagoons, and sheltered bays.

Major Threats

Loss and degradation of intertidal non-breeding and staging areas, particularly in the Yellow Sea, through reclamation, pollution, disturbance, and reduced river flows. Highly concentrated at a few major sites during both northward and southward migration.

Knowledge Gaps

More knowledge required regarding dependence on key staging sites; in particular, driving mechanisms and likely persistence of the apparent high suitability of the

Bar-tailed Godwit (*L. l. baueri*) *Sites of international importance (1% = 1,330; 0.25% = 333).*

Site	Country	Name	Max Count	Date	Ref.
347	USA	Yukon-Kuskokwim Delta	61,000	03–05 Sep 97	*89*
343	USA	Egegik Bay	30,000	03–05 Sep 97	*89*
269	New Zealand	Manukau Harbour	22,571	1983–1994	*182*
		updated count	***21,110***	***05 Dec 10***	*160*
263	New Zealand	Farewell Spit	17,181	1983–1994	*182*
		updated count	***15,723***	***Feb 10***	*160*
267	New Zealand	Kaipara Harbour	15,426	26 Nov 11	*160*
18	Australia	Corner Inlet	13,139	01 Jan 93	*6*
24	Australia	Great Sandy Strait	12,986	01 Jan 93	*69*
264	New Zealand	Firth of Thames	12,264	1983–1994	*182*
		updated count	***8,667***	***26 Nov 06***	*160*
40	Australia	Moreton Bay	11,751	01 Jan 96	*6*
342	USA	Cinder Lagoon	10,000	<1997	*88*
344	USA	Port Heiden	10,000	<1997	*88*
345	USA	Port Moller/Nelson Lagoon/Mud Bay	10,000	<1997	*88*
275	New Zealand	Tauranga Harbour	9,426	12 Nov 11	*160*
274	New Zealand	Rangaunu Harbour	7,850	1983–1994	*182*
		updated count	***3,850***	***12 Nov 07***	*160*
278	New Zealand	Whangarei Harbour	7,245	1983–1994	*182*
		updated count	***3,205***	***04 Nov 06***	*160*
268	New Zealand	Kawhia Harbour	5,350	1983–1994	*182*
		updated count	***4,353***	***19 Nov 05***	*160*
273	New Zealand	Parengarenga Harbour	5,200	1983–1994	*182*
		updated count	***4,062***	***12 Dec 10***	*160*
60	Australia	Shoalwater Bay & Broad Sound	5,151	01 Dec 95	*70*
272	New Zealand	Ohope/Ohiwa Harbour	5,000	1983–1994	*182*
		updated count	***3,809***	***12 Nov 09***	*160*
25	Australia	Hunter Estuary	4,000	<1991	*188*
271	New Zealand	Motueka Estuary	3,465	Feb 11	*160*
44	Australia	Orielton Lagoon	3,002	2007	*127*
270	New Zealand	Matarangi Spit – Whangapoa	3,000	10 Nov 10	*160*
276	New Zealand	Waitemata Harbour	3,000	14 Nov 04	*160*
260	New Zealand	Aotea Harbour	2,950	Nov 99	*160*
277	New Zealand	Westhaven (Whanganui) Inlet	2,738	Feb 11	*160*
265	New Zealand	Houhora Harbour	2,567	1994–2003	*190*
		updated count	***1,300***	***11 Dec 10***	*160*
279	North Korea	Mundok Migratory Bird Wetland Reserve	2,400	27 Apr 09	*171*

Table continues

Yalu River mouth region warrant investigation. Some uncertainty exists regarding the degree of spatial overlap in northern Australian non-breeding ranges of *L. l. menzbieri* and *baueri*, which complicates population estimates of the two subspecies.

General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3005

Bar-tailed Godwit (*L. l. baueri*) *Sites of international importance (1% = 1,330; 0.25% = 333), cont.*

Site	Country	Name	Max Count	Date	Ref.
266	New Zealand	Invercargill – Awarua Bay	2,342	06 Nov 10	*160*
262	New Zealand	East Waimea Inlet	2,300	Nov 10	*160*
261	New Zealand	Avon-Heathcote Estuary	2,088	01 Dec 10	*160*

Bar-tailed Godwit (unknown population) *Sites of international importance (L. l. menzbieri and baueri combined: 1% = 2,790; 0.25% = 698).*

Site	Country	Name	Max Count	Date	Ref.
85	China	Yalujiang National Nature Reserve, Liaoning	66,134	25 Apr 04	*18*
105	China	Laizhou Wan	25,961	10 May 04	*18*
143	China	Pulandian – Jinzhou East Coast, Liaoning	12,785	May 05	*19*
318	South Korea	Geum River Estuary (incl. Yubu Island)	12,479	Late Apr 06	*175*
99	China	Huang He Delta Nature Reserve	10,678	21 Apr 97	*230*
316	South Korea	Dongjin River Estuary	8,430	01 May 98	*229*
324	South Korea	Han River Estuary	8,000	01 May 00	*184*
152	China	Zhuanghe East Coast	7,700	May 05	*19*
124	China	Rudong Mudflats	7,555	Late Apr 05	*19*
39	Australia	Milingimbi Coast	7,000	15 Dec 98	*45*
154	Indonesia	Banyuasin Delta*	7,000	01 Jan 96	*184*
332	South Korea	Namyang Bay	5,800	01 May 98	*229*
21	Australia	Elcho Island	5,000	25 Mar 99	*45*
109	China	Lianyungang Coast	4,702	01 Apr 13	*46*
130	China	Shuangtaizihekou National Nature Reserve	3,738	20 Apr 99	*20*
		updated count	***2,470***	***13 Aug 11***	*46*
250	Malaysia	North-central Selangor Coast*	3,500	23 Mar 12	*33*
311	South Korea	Asan Bay	3,500	16 Apr 99	*146*
337	South Korea	Yeongjong Island	3,500	30 Apr 99	*15*
328	South Korea	Mangyung River Estuary	3,350	01 May 98	*229*
108	China	Laoting (Daqinghe – Shijiutuo)	3,000	14 Aug 94	*66*
153	China	Zhuanghe West Coast	2,890	May 05	*19*
136	China	Tianjin Coast	2,321	12 Apr 00	*17*
317	South Korea	Ganghwa Tidal Flat	2,200	01 May 98	*229*
310	South Korea	Aphae Island	2,157	01 May 98	*146*
111	China	Linghekou, Jin, Liaoning	2,045	29 Apr 99	*13*
335	South Korea	Suncheon Bay	1,868	15 Apr 98	*146*
313	South Korea	Cheonsu Bay	1,752	15 Apr 98	*146*
333	South Korea	Seosan	1,732	01 May 97	*146*
88	China	Dongtai (Zhou Gang – Qiang Gang Coast)	1,725	28 Apr 01	*16*
100	China	Huanghua Coast (Cangzhou)	1,725	01 May 10	*46*
87	China	Dongsha Shoals	1,668	01 Sep 97	*205*
133	China	Wudi-Zhanhua-Hekou Coast, Shandong	1,499	02 May 02	*17*
322	South Korea	Haenam Hwangsan	1,272	15 Apr 98	*146*
305	Russia	Schastiya Bay	953	01 Sep 02	*4*
165	Japan	Arao Kaigan	900	01 May 02	*222*
227	Japan	Sone Higata (Sone-Higata Tideland)	781	29 Apr 02	*114*

* These two sites are not included in the 'potential' sites for *L. l. baueri* in Tables 4–6 of the *Summary by Country* section, because they lie outside the likely range of the population.

WHIMBREL
NUMENIUS PHAEOPUS VARIEGATUS

EAAF population size: **55,000**

EAAF population trend: **Decline**

Global Red List status: **Least Concern**

4

Despite apparent overall declines globally, Whimbrel is currently considered a species of Least Concern according to IUCN Red List criteria, due to its worldwide distribution and very large population[31]. In the EAAF, substantial declines in the endemic subspecies *N. p. variegatus* are evident in both non-breeding and migration counts[80], and further proposed degradation of intertidal staging habitats, particularly in the Yellow Sea, are likely to perpetuate or exacerbate this decline. Therefore, the EEAF population may qualify for **Near Threatened** status at the regional level (criterion A3/4).

Taxonomy

Circumpolar breeding distribution, with six global subspecies recognized. Only one of these (*N. p. variegatus*) occurs in the EAAF, where it is endemic.

Population

Size: the flyway population estimate of 55,000 is based on expert opinion and has not been revised since 2002[64]. Estimates of very large numbers of Whimbrel moving through Kamchatka on southward migration (≥100,000)[86,104] have not been supported by numbers elsewhere in the EAAF. No new data exist to estimate the non-breeding population on the flyway.

Trend: non-breeding surveys in Australia (where perhaps as little as 10–20% of the population occurs) have indicated a population decline of 20–29% in three generations (27 years)[80]. Numbers passing through Japan on southward migration have declined more rapidly (by about 80% during 1978–2008), although the long-term trend during northward migration is less clear[1].

Distribution

Breeding: northeastern Siberia, both Arctic and subarctic.

Non-breeding: previously thought to be primarily northern and eastern Australia. The revised population size implies that far greater numbers occur in Southeast Asia and Indonesia than have been recorded. Many non-breeders and probably all first-year birds remain at non-breeding grounds all year round.

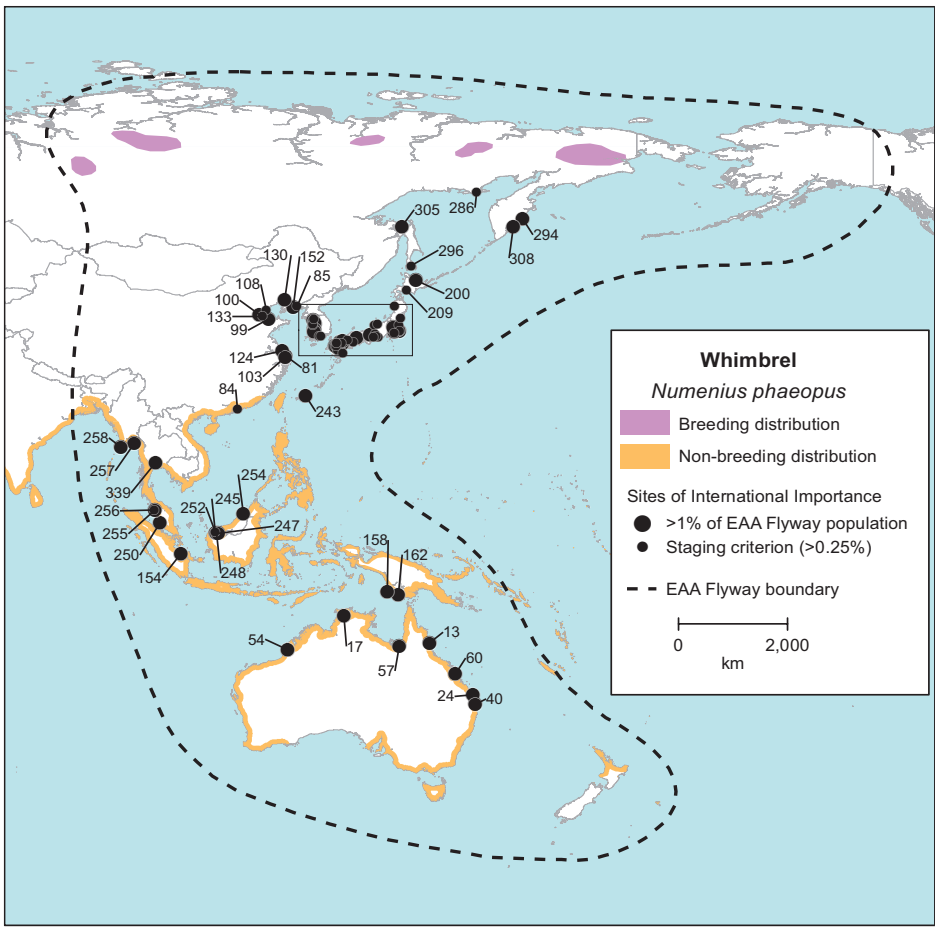
Migration: northward migration concentrated at few staging sites in the Yellow Sea and Japan. Most birds probably make a non-stop flight from non-breeding grounds to East Asian staging sites, and then fly non-stop to Siberian breeding grounds. Post-breeding, nearly entire flyway population stages in Kamchatka and many may bypass the Yellow Sea region on southward migration. Substantial numbers stage in Hong Kong and Malaysia on southward migration[43,211].

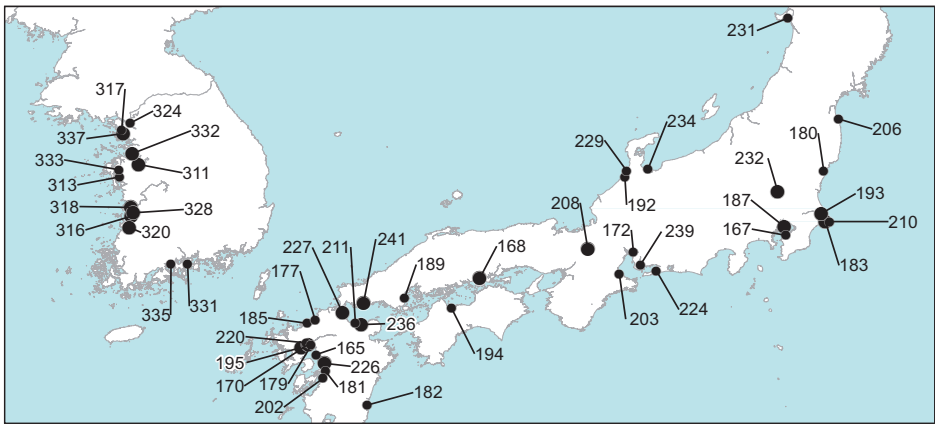
Habitat

Breeding: dry exposed locations in open areas and forests of boreal, subarctic, and subalpine zones, in variety of habitats such as sparse larch forest[122], moss and lichen tundra, sedge meadows, mossy hummock bogs, wet moorlands, and dry scrub heathland.

Non-breeding and migration: in non-breeding season, essentially coastal; beaches, tidal flats, marshes, exposed reefs, and mangroves. Also uses saline grasslands with standing water left after high spring-tides, and similar habitats in salt works.

Whimbrel
Range and sites of international importance. Site details on next page.





Major Threats	Destruction and degradation of intertidal non-breeding and staging sites, particularly in the Yellow Sea, through reclamation, pollution, disturbance, and reduced river flows. Unknown threats in the breeding season.
Knowledge Gaps	Insufficient data exist to evaluate current flyway population size. Causes of apparent declines are unknown. Range of migration strategies and routes is poorly described. Use of non-breeding sites in Southeast Asia and Indonesia apparently underestimated and poorly understood.
General Information	http://www.birdlife.org/datazone/speciesfactsheet.php?id=3009

Whimbrel *Sites of international importance (1% = 550; 0.25% = 138).*

Site	Country	Name	Max Count	Date	Ref.
60	Australia	Shoalwater Bay & Broad Sound	7,124	01 Dec 95	*70*
294	Russia	Kronotsky Nature Reserve	6,000	25 May 84	*130*
305	Russia	Schastiya Bay	4,325	01 Sep 02	*4*
183	Japan	Iioka Kaigan	4,041	01 May 98	*118*
57	Australia	SE Gulf of Carpentaria	3,414	01 Mar 99	*71*
193	Japan	Kamisu-Chou Takahama	3,340	12 May 01	*224*
24	Australia	Great Sandy Strait	3,128	<1991	*69*
250	Malaysia	North-central Selangor Coast	3,000	06 Dec 09	*33*
152	China	Zhuanghe East Coast	2,658	May 05	*19*
99	China	Huang He Delta Nature Reserve	2,626	27 Apr 98	*230*
308	Russia	Vakhil River Mouth	2,500	01 May 91	*86*
257	Myanmar	Inner Gulf of Martaban	1,597	Winter 2008	*232*
17	Australia	Chambers Bay	1,500	<2004	*45*
40	Australia	Moreton Bay	1,440	01 Jan 96	*6*
162	Indonesia	Wasur National Park	1,400	02 Oct 83	*186*
195	Japan	Kashima Shingomori Kaigan	1,320	09 May 06	*114*
311	South Korea	Asan Bay	1,310	01 May 98	*229*
130	China	Shuangtaizihekou National Nature Reserve	1,306	12 May 98	*20*
187	Japan	Inner Tokyo Bay	1,220	01 May 00	*223*
318	South Korea	Geum River Estuary (incl. Yubu Island)	1,215	Mid-May 06	*175*
81	China	Chongming Dongtan National Nature Reserve	1,200	20 Apr 99	*15*
124	China	Rudong Mudflats	1,162	20–26 Apr 05	*19*
54	Australia	Roebuck Bay	1,140	01 Dec 08	*6*
316	South Korea	Dongjin River Estuary	1,070	01 May 98	*229*
252	Malaysia	Sejinkat Ashponds	1,060	30 Aug 11	*33*
158	Indonesia	Pulau Komolom	1,050	30 Sep 83	*35*
13	Australia	Cairns Foreshore	1,027	21 Mar 95	*93*
258	Myanmar	Irrawaddy Delta	1,025	01 Feb 06	*152*
154	Indonesia	Banyuasin Delta	1,000	13 Feb 93	*214*
200	Japan	Komuke-ko	970	15 Sep 00	*223*
232	Japan	Tochigi-ken Nanbu Suiden-chitai	928	05 May 96	*77*
248	Malaysia	Kuala Samarahan – Kuala Sadong	875	Jan–Feb 06	*145*
100	China	Huanghua Coast (Cangzhou)	865	01 Aug 07	*46*
236	Japan	Usa Kaigan	839	01 May 98	*118*
337	South Korea	Yeongjong Island	825	01 May 98	*229*
103	China	Jiu Duan Sha National Nature Reserve	800	01 May 01	*15*
168	Japan	Chidorihama, Kiya-gawa Kako	760	29 Apr 10	*114*
254	Malaysia	Tanjung Situngkat	750	21 Feb 12	*7*
339	Thailand	Inner Gulf of Thailand	750	03 Sep 00	*26*
332	South Korea	Namyang Bay	740	02 May 99	*15*
226	Japan	Shira-kawa Kako	708	06 May 07	*114*
243	Japan	Yonaha-wan	657	01 May 98	*118*
247	Malaysia	Kuala Sadong – Kuala Lupar	650	20 Jan 11	*7*
227	Japan	Sone Higata (Sone-Higata Tideland)	625	06 May 96	*77*

Table continues

Whimbrel *Sites of international importance (1% = 550; 0.25% = 138), continued.*

Site	Country	Name	Max Count	Date	Ref.
328	South Korea	Mangyung River Estuary	620	01 May 98	*229*
320	South Korea	Gomso Bay	609	Late Apr 06	*175*
170	Japan	Daijugarami	607	01 May 01	*224*
208	Japan	Moriyamashi-kogan	572	01 May 98	*118*
241	Japan	Yamaguti-wan	559	24 Apr 12	*114*
256	Malaysia	Teluk Air Tawar-Kuala Muda Coast	550	Jan–Apr 05	*126*
335	South Korea	Suncheon Bay	528	14 May 98	*146*
172	Japan	Fujimae Higata	515	30 Apr 93	*77*
181	Japan	Hikawa Estuary, Shiranui	488	29 Apr 12	*114*
317	South Korea	Ganghwa Tidal Flat	485	01 May 98	*229*
165	Japan	Arao Kaigan	483	04 May 12	*114*
313	South Korea	Cheonsu Bay	432	01 May 98	*146*
333	South Korea	Seosan	432	01 May 97	*146*
192	Japan	Kahokugata	426	14 May 96	*77*
194	Japan	Kamo-gawa Kako	415	08 May 05	*114*
224	Japan	Shio-kawa Higata	415	01 May 01	*224*
229	Japan	Takamatsu, Kahoku Kaigan	411	15 May 04	*114*
331	South Korea	Namhae	407	15 May 98	*146*
239	Japan	Yahagi-gawa Kako Shuhen	354	01 May 00	*223*
203	Japan	Kumozugawa, Atagogawa & Kongogawa Estuaries	352	16 May 96	*77*
220	Japan	Rokkaku-gawa Kako (Ashikari-cho)	330	23 Apr 00	*114*
180	Japan	Hikata Hachimangoku	326	29 Apr 98	*118*
231	Japan	Ten-no Kaigan	323	11 May 04	*114*
324	South Korea	Han River Estuary	320	01 May 00	*184*
108	China	Laoting (Daqinghe –Shijiutuo)	300	25 Aug 99	*181*
84	China	Deep Bay (incl. Mai Po & Futian)	300	24 Aug 91	*102*
		updated count	***237***	***24 Aug 10***	*102*
210	Japan	Nagasaki Kaigan	300	01 May 98	*118*
245	Malaysia	Bako-Buntal Bay	300	26 Oct 11	*7*
296	Russia	Lososei Bay	300	27 May 87	*154*
85	China	Yalujiang National Nature Reserve, Liaoning	286	02 May 99	*14*
202	Japan	Kuma-gawa Kako	283	01 May 09	*114*
133	China	Wudi-Zhanhua-Hekou coast, Shandong	278	02 May 02	*17*
286	Russia	Babushkina Bay	278	01 Aug 95	*63*
189	Japan	Iwakuni-shi Ozu Hasuda	272	08 May 05	*114*
209	Japan	Mukawa Kako	250	19 May 01	*224*
255	Malaysia	Tanjung Tokong Mudflats	250	26 Sep 06	*33*
211	Japan	Nakatsu Kaigan (Higashi-hama)	218	28 Apr 02	*114*
182	Japan	Hitotsuba Irie	200	20 Apr 10	*114*
234	Japan	Toyama Shinko	200	29 Aug 01	*114*
185	Japan	Imazu Higata	198	25 Apr 04	*114*
179	Japan	Hayatsue-gawa Kako (Kawasoe-machi)	189	22 Apr 01	*114*
206	Japan	Matsukawa-ura	180	09 May 07	*114*
167	Japan	Banzu	171	27 Apr 08	*114*
177	Japan	Hakata-wan Tobu (Wajiro, Tatara)	146	02 May 10	*114*

FAR EASTERN CURLEW
NUMENIUS MADAGASCARIENSIS

EAAF population size: **32,000**
EAAF population trend: **Strong decline**
Global Red List status: **Vulnerable**

5

Recent strong population declines in this EAAF endemic species qualify it for **Vulnerable** status at both global and regional level under IUCN Red List criterion A2/3/4[80]. The Far Eastern Curlew is listed on Appendix I of the Convention on Migratory Species, and is proposed as a Cooperative Action Species[55]. Concerns that the rather small population may yet be overestimated suggest that additional data may support upgrading of its status to Endangered in the near future.

Taxonomy

Monotypic species endemic to EAAF.

Population

Size: preliminary current population estimate of 32,000[210] derived by applying observed flyway declines[80] to previous population estimate of 38,000[8]. However, according to expert opinion, the current population may not exceed 20,000 individuals[215].

Trend: non-breeding surveys in Australia have indicated a population decline of 30–49% in three generations (30 years)[80]. However, numbers migrating through Japan showed no clear trend over the same time period[1]. Approximately 1,800 birds are thought to have disappeared following the reclamation of a major staging site at Saemangeum, South Korea[149].

Distribution

Breeding: northeast Mongolia, northeast China, and eastern Siberia to Kamchatka.

Non-breeding: more than 70% in Australia, with small numbers in New Zealand, Indonesia, Papua New Guinea, and southeast China. Females appear to migrate further south than males[153]. Immature birds may remain year-round on the non-breeding grounds until their third year.

Migration: capable of non-stop flight from non-breeding grounds to eastern China and Yellow Sea region, but many migration strategies, with varying number of northward stops, appear to exist[72]. Southward migration is more easterly and less continental, with many more birds passing through Japan, than northward migration. Southbound birds typically make one major flight to Australasia, followed by a series of shorter flights to the final non-breeding destination[72].

Habitat

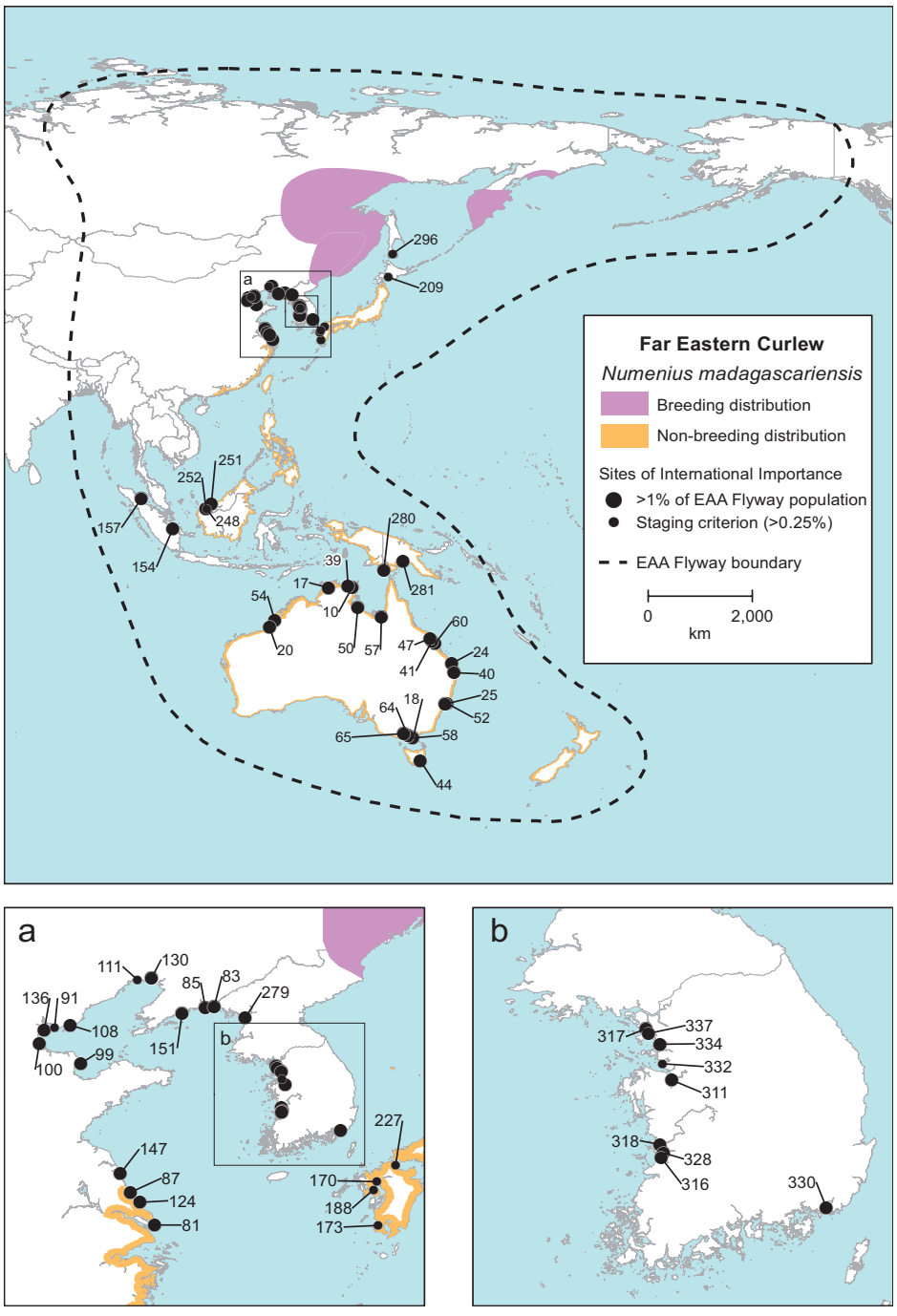
Breeding: open mossy or transitional bogs, moss-lichen bogs, wet meadows, swampy shores of small lakes.

Non-breeding and migration: coastal estuaries, mangrove swamps, saltmarshes, and tidal flats. Particularly on tidal flats with extensive seagrass (Zosteraceae) meadows. Often roosts in salt marshes, behind mangroves and on sandy beaches.

Major Threats

Destruction and degradation of intertidal non-breeding and staging sites, particularly in the Yellow Sea, through reclamation, pollution, disturbance, and reduced river flows. May face direct persecution, including subsistence hunting and deliberate poisoning, throughout its range. Farming, fire management, and development represent potential threats to the southern part of the breeding range[39]. Differential migration may result in sex-bias in threats during the non-breeding season, because coastal sites in southern Australia (predominantly

Far Eastern Curlew
Range and sites of international importance. Site details on next page.



occupied by females) are more threatened by disturbance and development than northern sites.

Knowledge Gaps

Severity of threats in breeding season is unknown. Difficult to determine the proportion of observed declines that may represent displacements to unknown sites. Variation in individual migration strategies poorly understood. Migration routes and non-breeding range of birds from the northern part of the breeding range are unknown. Although reported in Liaoning and Shandong, extent of deliberate poisoning in China is unknown.

Far Eastern Curlew *Sites of international importance (1% = 320; 0.25% = 80).*

Site	Country	Name	Max Count	Date	Ref.
24	Australia	Great Sandy Strait	6,018	01 Jan 93	*69*
85	China	Yalujiang National Nature Reserve, Liaoning	5,289	16 Jul 11	*46*
83	China	Dandong Port East	5,200	Jul 09	*101*
40	Australia	Moreton Bay	3,500	01 Jan 96	*6*
60	Australia	Shoalwater Bay & Broad Sound	2,986	01 Dec 95	*70*
154	Indonesia	Banyuasin Delta	2,620	01 Oct 88	*202*
318	South Korea	Geum River Estuary (incl. Yubu Island)	2,582	Mid-May 06	*175*
18	Australia	Corner Inlet	2,281	01 Jan 93	*6*
54	Australia	Roebuck Bay	2,160	01 Jan 93	*6*
		updated count	***776***	***01 Nov 05***	*6*
317	South Korea	Ganghwa Tidal Flat	2,120	01 May 98	*229*
58	Australia	Shallow Inlet/Sandy Point	1,954	01 Jan 95	*6*
279	North Korea	Mundok Migratory Bird Wetland Reserve	1,890	<2001	*15*
41	Australia	Notch Point	1,850	25 Oct 94	*6*
130	China	Shuangtaizihekou National Nature Reserve	1,817	19 Aug 99	*15*
57	Australia	SE Gulf of Carpentaria	1,811	01 Mar 99	*71*
147	China	Yancheng Nature Reserve	1,718	01 Jul 94	*204*
136	China	Tianjin Coast	1,675	01 Sep 07	*46*
337	South Korea	Yeongjong Island	1,620	26 Aug 99	*15*
87	China	Dongsha Shoals	1,532	01 Sep 97	*205*
151	China	Zhuanghe Wan	1,323	02 Sep 11	*46*
64	Australia	Western Port	1,294	02 Jan 87	*6*
311	South Korea	Asan Bay	1,170	16 Apr 99	*15*
99	China	Huang He Delta Nature Reserve	1,125	04 Apr 99	*230*
328	South Korea	Mangyung River Estuary	1,100	03 Oct 99	*15*
17	Australia	Chambers Bay	1,050	<2001	*44*
316	South Korea	Dongjin River Estuary	1,045	17 Apr 99	*15*
52	Australia	Port Stephens	960	<1991	*188*
334	South Korea	Songdo Tidal Flat	870	2006–2010	*34*
65	Australia	Western Port Phillip Bay	808	02 Sep 86	*6*
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	800	04 Jan 09	*108*
81	China	Chongming Dongtan National Nature Reserve	794	31 Mar 96	*12*
47	Australia	Pioneer River – McEwan's Beach	710	<1988	*121*
20	Australia	Eighty Mile Beach	709	17 Oct 98	*5*
10	Australia	Buckingham Bay	700	25 Jun 99	*45*
39	Australia	Milingimbi Coast	700	<2001	*44*
44	Australia	Orielton Lagoon	696	2007	*127*
252	Malaysia	Sejinkat Ashponds	660	20 Feb 11	*7*

Table continues

General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3014

Far Eastern Curlew *Sites of international importance (1% = 320; 0.25% = 80), continued.*

Site	Country	Name	Max Count	Date	Ref.
25	Australia	Hunter Estuary	653	02 Mar 84	*6*
330	South Korea	Nakdong Estuary	635	01 Sep 83	*184*
100	China	Huanghua Coast (Cangzhou)	603	01 Jul 07	*46*
124	China	Rudong Mudflats	519	Late Apr 05	*19*
		updated count	***495***	***01 Jun 11***	*46*
108	China	Laoting (Daqinghe – Shijiutuo)	500	30 Aug 99	*181*
251	Malaysia	Pulau Bruit	411	15 Apr 86	*103*
50	Australia	Port McArthur	407	<2001	*44*
280	Papua New Guinea	Bensbach-Bula Coast	350	23 Oct 00	*35*
281	Papua New Guinea	Kikori Delta	343	20 Mar 00	*212*
332	South Korea	Namyang Bay	280	01 May 97	*229*
173	Japan	Fukiagehama Kaigan	254	01 May 97	*115*
248	Malaysia	Kuala Samarahan – Kuala Sadong	230	10 Apr 05	*33*
91	China	Luannan Coast & Saltworks	221	02 May 02	*17*
111	China	Linghekou, Jin, Liaoning	132	29 Apr 99	*13*
188	Japan	Isahaya Higata	120	11 Sep 96	*77*
227	Japan	Sone Higata (Sone-Higata Tideland)	105	01 May 98	*118*
296	Russia	Lososei Bay	100	23 May 90	*154*
170	Japan	Daijugarami	98	06 Apr 03	*114*
209	Japan	Mukawa Kako	87	15 May 09	*114*

SPOTTED GREENSHANK
TRINGA GUTTIFER

EAAF population size: **1,200**
EAAF population trend: **Steep decline**
Global Red List status: **Endangered**

6

Also known as 'Nordmann's Greenshank', this species is listed on Appendix I of the Convention on Migratory Species[55], and has been considered **Endangered** since 1994, based on its very small population and apparent strong decline (Red List criterion C2)[31]. As an endemic species to the EAAF, this status applies at both the global and regional level. Recent breeding surveys in Russia have indicated that the population decline may be very steep, and that a review of its threat status in the near future is warranted[31]. However, a recent report of more than 1,100 Spotted Greenshanks at Rudong, China during southward migration[191] suggests the current population is at least double the most recent estimate of 400–600 birds[215].

Taxonomy

Monotypic species endemic to EAAF.

Population

Size: after breeding surveys in Russia during 2010–2011 indicated a very rapid decline[31], the previous population estimate of 1,000[8] was deemed optimistic and revised downward to 400–600[215]. However, in October 2013, a single group of 1,117 was recorded at Rudong, China[191]. Therefore, the estimate must be revised to a minimum of 1,200 birds, but the actual number is almost certainly higher.

Trend: unquantified but thought to be severe[31].

Distribution

Breeding: Sakhalin Island and Russian coast of Sea of Okhotsk.

Non-breeding: Bangladesh, northeastern India, Southeast Asia, and small numbers to western Indonesia.

Migration: routes through China, Russia, and the Yellow Sea appear similar for northward and southward migrations, with greater apparent use of Southeast Asia during northward migration.

Habitat

Breeding: boreal forest in sparse larch (*Larix*) forest and wet coastal meadows and swamps, close to shallow bays. Adults feed on mudflats during breeding season.

Non-breeding and migration: coastal estuaries, tidal flats, and lowland swamps. Often roosts in association with Grey Plover *Pluvialis squatarola*.

Major Threats

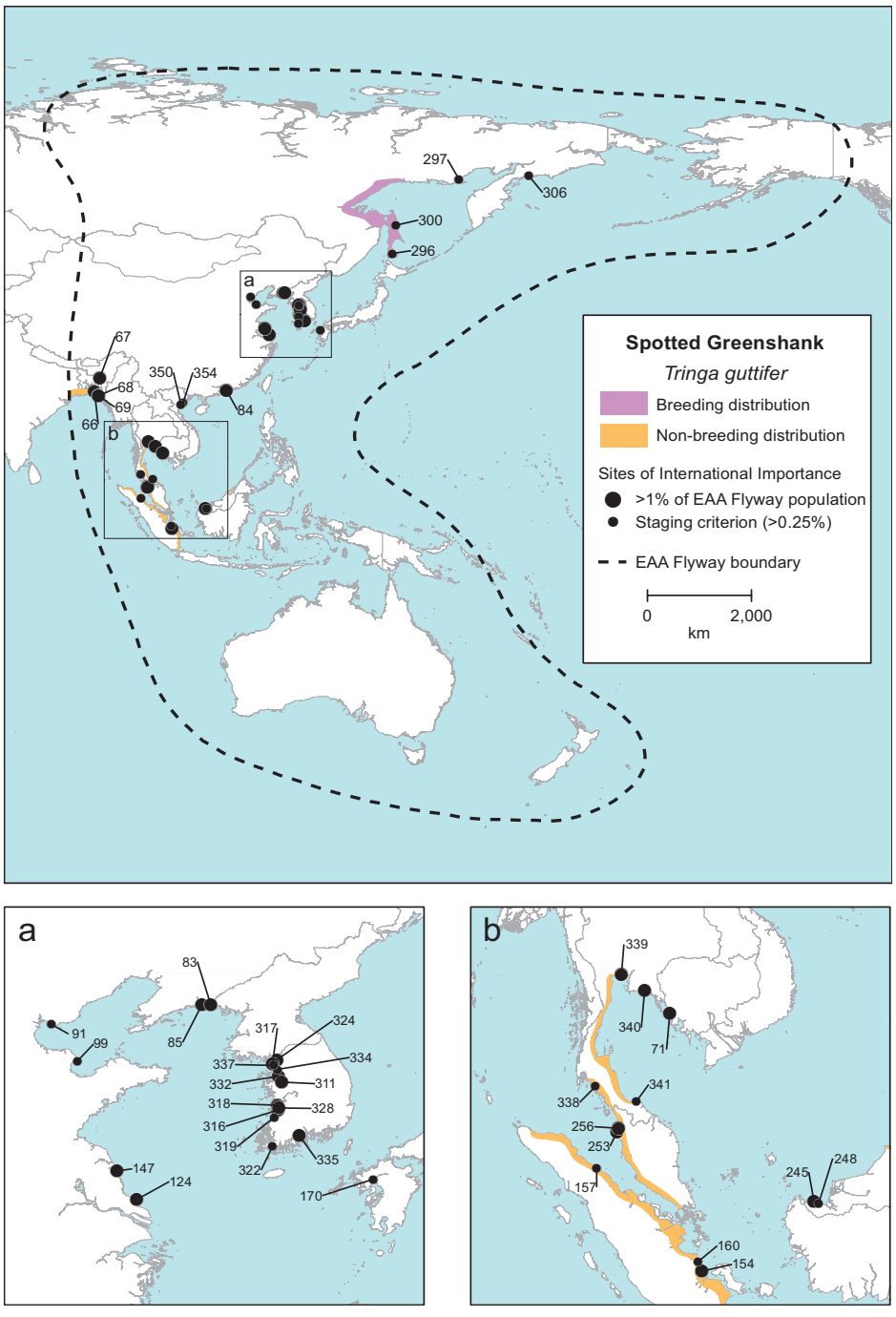
Destruction and degradation of coastal staging and non-breeding sites through reclamation, pollution, disturbance, and reduced river flows. Degradation of breeding habitat by grazing reindeer, and future oil development. Also subject to hunting in the breeding season. Formerly used as a live decoy bird by commercial bird trappers in Hangzhou Bay, China[206].

Knowledge Gaps

Year-round ecology and life history are poorly described. Lifespan and age at first breeding unknown. Insufficient data exist for precise estimates of population size or trend. Ultimate causes for decline are poorly understood. Non-breeding counts are complicated by lack of major concentrations and use of poorly surveyed habitats.

Spotted Greenshank

Range and sites of international importance. Site details on next page.



General Information

http://www.birdlife.org/datazone/speciesfactsheet.php?id=3020

http://www.birdlife.org/datazone/userfiles/file/Species/AsRDBPDFs/species/tringutt.pdf

© John & Jemi Holmes. *Mai Po in Deep Bay, Hong Kong (Site #84)*

Although the total population had been previously estimated at 400–600 individuals, a single group of more than 1,100 **Spotted Greenshanks** was observed at China's Rudong Mudflats in October 2013. This underscores the need for constant monitoring of both populations and use of specific sites on the flyway.

Spotted Greenshank *Sites of international importance (1% = 12; 0.25% = 3).*

Site	Country	Name	Max Count	Date	Ref.
124	China	Rudong Mudflats	1,117	Mid-Oct 13	*191*
66	Bangladesh	Ganges-Brahmaputra-Meghna Delta	200	18 Jan 88	*214*
		updated count	***19***	***28 Mar 10***	*29*
324	South Korea	Han River Estuary	79	01 May 00	*184*
253	Malaysia	Sungai Nibong, Pulau Pinang	75	03 Feb 07	*33*
318	South Korea	Geum River Estuary (incl. Yubu Island)	70	Mid-May 06	*175*
256	Malaysia	Teluk Air Tawar-Kuala Muda Coast	63	16 Feb 13	*33*
339	Thailand	Inner Gulf of Thailand	60	24 Dec 05	*179*
316	South Korea	Dongjin River Estuary	59	<2003	*15*
84	China	Deep Bay (incl. Mai Po & Futian)	58	13 Apr 93	*102*
		updated count	***46***	***09 Apr 07***	*102*
332	South Korea	Namyang Bay	57	02 May 99	*15*
328	South Korea	Mangyung River Estuary	52	<2003	*15*
340	Thailand	Mouth of the Prasae River	50	11–12 Nov 10	*28*

Table continues

Spotted Greenshank *Sites of international importance (1% = 12; 0.25% = 3), continued.*

Site	Country	Name	Max Count	Date	Ref.
85	China	Yalujiang National Nature Reserve, Liaoning	42	15 Sep 12	*46*
317	South Korea	Ganghwa Tidal Flat	40	<2004	*229*
147	China	Yancheng Nature Reserve	35	01 Apr 90	*204*
83	China	Dandong Port East	34	May 09	*101*
69	Bangladesh	Sonadia & Moheskhali Island	28	Mar 10	*50*
335	South Korea	Suncheon Bay	26	03 Sep 98	*146*
67	Bangladesh	Hakaluki Haors	25	Dec 92	*196*
68	Bangladesh	Hasher Char	24	11 Mar 10	*29*
154	Indonesia	Banyuasin Delta	21	01 Dec 89	*202*
245	Malaysia	Bako-Buntal Bay	14	20 Jan 11	*7*
71	Cambodia	Koh Kong (Kaoh Kapik)	13	30 Jan 96	*213*
311	South Korea	Asan Bay	12	01 May 97	*229*
99	China	Huang He Delta Nature Reserve	11	09 Sep 91	*208*
334	South Korea	Songdo Tidal Flat	11	2006–2010	*34*
91	China	Luannan Coast & Saltworks	10	Apr–May 12	*97*
297	Russia	Malkachan River Mouth	10	23 Aug 97	*119*
300	Russia	Nabilsky Bay	10	20 Jul 84	*154*
354	Vietnam	Xuan Thuy Ramsar Site	8	03 May 96	*163*
337	South Korea	Yeongjong Island	7	17 Aug 98	*229*
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	6	08 Oct 05	*59*
160	Indonesia	Sungai Cemara Beach	5	2002	*127*
296	Russia	Lososei Bay	5	23 May 91	*154*
306	Russia	Skobeleva Bay	5	25 May 98	*85*
319	South Korea	Gochang-gun	5	01 Oct 94	*229*
350	Vietnam	Nghia Hung	5	04 May 96	163
170	Japan	Daijugarami	4	15 Sep 07	*114*
322	South Korea	Haenam Hwangsan	4	30 Aug 98	*146*
338	Thailand	Bo Muang/Tha Maprao	4	29 Jun 05	*127*
341	Thailand	Pattani Bay	4	2007	*127*
248	Malaysia	Kuala Samarahan – Kuala Sadong	3	10 Apr 05	*33*

GREY-TAILED TATTLER
HETEROSCELUS BREVIPES

EAAF population size: **44,000**

EAAF population trend: **Decline**

Global Red List status: **Least Concern**

7

Currently, the Grey-tailed Tattler is considered a species of Least Concern, because its population was previously thought to be stable[31]. However, the species is a candidate for upgrading based on recent declines in the EAAF[133]. As a flyway endemic, the species would qualify for **Near Threatened** status at both the global and regional level under IUCN Red List criterion A[80].

Taxonomy

Monotypic species endemic to EAAF.

Population

Size: preliminary current population estimate of 44,000[210] derived by applying observed flyway declines[80] to previous population estimate of 50,000[8].

Trend: non-breeding surveys in Australia have indicated a population decline of 20–29% in three generations (25 years)[80]. Numbers passing through Japan on southward migration have declined more rapidly (by 57% during 1998–2008)[1].

Distribution

Breeding: boreal central and eastern Siberia to Kamchatka. Breeding range appears to extend much further west than previously thought (as far as the Yenisey River)[122].

Non-breeding: approximately 90% of population in coastal Australia, with small numbers in Southeast Asia, Taiwan, Philippines, Indonesia, Papua New Guinea, and New Zealand. Juveniles and non-breeders often remain in the non-breeding range during the breeding season.

Migration: both northward and southward migrations go primarily through Japan; numbers using the Yellow Sea are low, but greater during southward migration. The small number of important sites south of Japan suggests that long, direct flights occur between Australia and Japan, with moderate numbers stopping in the Philippines.

Habitat

Breeding: gravel beds along fast-running rivers and streams in mountainous areas, and in rocky fields in lake valleys. Sometimes uses deserted nests in trees. Altitudes of 50–1,750 m, from boreal zone to Arctic alpine areas[122].

Non-breeding and migration: coastal mudbanks, reefs, and tidal flats, especially those with seagrass and near mangroves; also rocky shores.

Major Threats

Generally threatened by coastal wetland loss and degradation through reclamation, pollution, disturbance, and reduced river flows. Unknown threats in the breeding season.

Knowledge Gaps

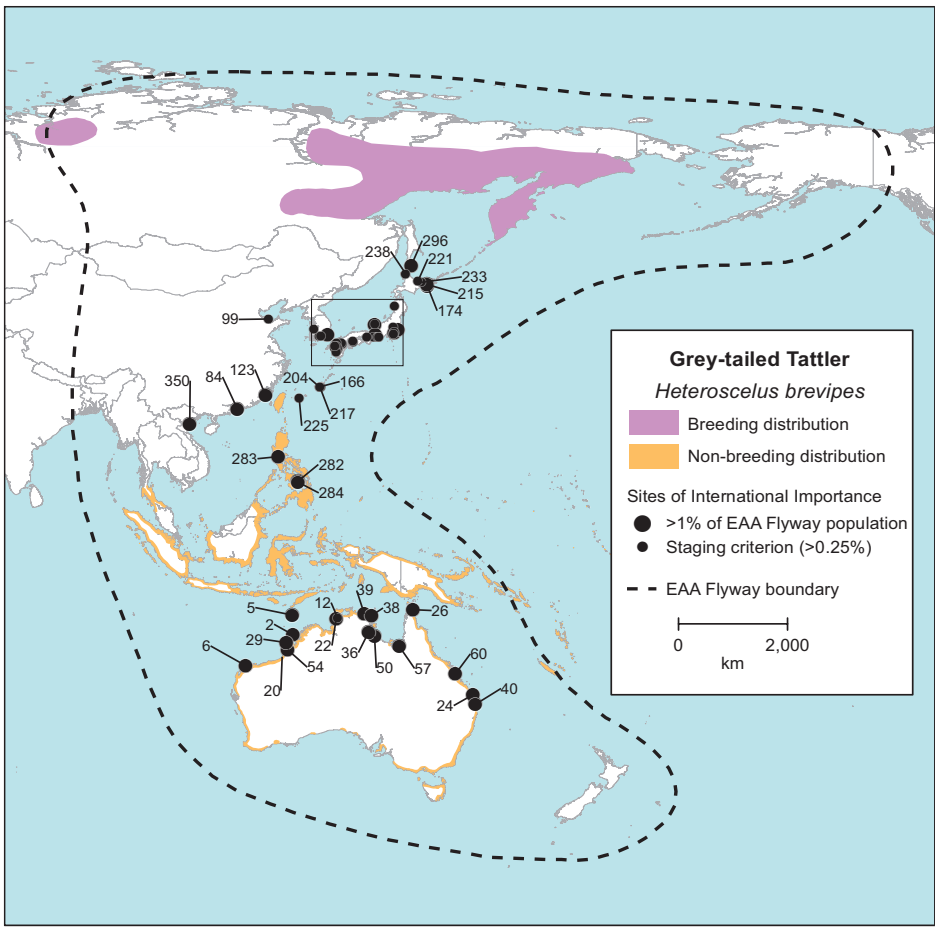
Causes for observed population decline are unknown. Estimates of breeding and non-breeding populations are made difficult by lack of major concentrations. Breeding ecology and range are poorly understood.

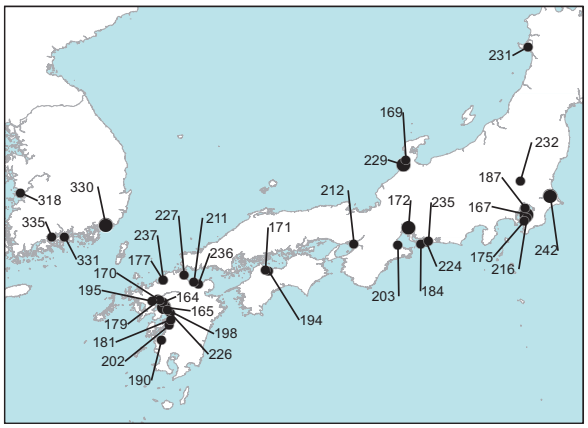
General Information

http://www.birdlife.org/datazone/speciesfactsheet.php?id=3029

Grey-tailed Tattler

Range and sites of international importance. Site details on next page.





Grey-tailed Tattler *Sites of international importance (1% = 440; 0.25% = 110).*

Site	Country	Name	Max Count	Date	Ref.
20	Australia	Eighty Mile Beach	15,704	01 Nov 12	*6*
24	Australia	Great Sandy Strait	7,680	01 Jan 93	*69*
2	Australia	Adele Island	5,489	21 Nov 04	*37*
40	Australia	Moreton Bay	3,736	01 Dec 89	*68*
174	Japan	Furen-ko	3,263	03 Aug 11	*114*
60	Australia	Shoalwater Bay & Broad Sound	3,014	01 Dec 95	*70*
54	Australia	Roebuck Bay	2,805	01 Dec 08	*6*
6	Australia	Barrow Island	2,634	12 Jan 04	*11*
215	Japan	Notsuke-zaki, Odaito	1,924	15 Sep 01	*224*
5	Australia	Ashmore Reef	1,791	01 Feb 05	*193*
29	Australia	Lacepede Islands	1,593	01 Dec 04	*177*
50	Australia	Port McArthur	1,550	15 Oct 96	*45*
296	Russia	Lososei Bay	1,500	09 Aug 03	*105*
26	Australia	Islands off False Orford Ness	1,078	25 Nov 87	*56*
165	Japan	Arao Kaigan	975	05 Aug 08	*114*
330	South Korea	Nakdong Estuary	966	2004–05	*73*
229	Japan	Takamatsu, Kahoku Kaigan	891	15 May 04	*114*
167	Japan	Banzu	808	15 Sep 97	*117*
39	Australia	Milingimbi Coast	800	<2001	*44*
57	Australia	SE Gulf of Carpentaria	745	01 Mar 99	*71*
282	Philippines	Cebu-Mactan	710	23 Apr 87	*151*
38	Australia	Low Island, Arnhem Bay	600	15 Nov 98	*45*
242	Japan	Yodaura Suiden	562	10 May 09	*114*
22	Australia	Fog Bay	560	<2004	*45*
84	China	Deep Bay (incl. Mai Po & Futian)	554	16 May 87	*102*
		updated count	***207***	***14 May 00***	*102*
123	China	Quanzhou Wan	520	05 May 11	*46*
172	Japan	Fujimae Higata	512	24 May 91	*77*
		updated count	***188***	***25 May 02***	*114*
36	Australia	Limmen River Mouth	500	15 Jul 98	*45*
283	Philippines	Manila Bay	500	25 Jan 94	*214*
350	Vietnam	Nghia Hung	480	25 Apr 94	*162*
284	Philippines	Olango Island	452	2005	*127*
203	Japan	Kumozugawa, Atagogawa & Kongogawa Estuaries	431	22 Sep 96	*77*
		updated count	***234***	***08 May 06***	*114*
335	South Korea	Suncheon Bay	429	14 May 98	*146*
224	Japan	Shio-kawa Higata	403	01 May 01	*224*
12	Australia	Bynoe Harbour	400	15 Sep 93	*45*
232	Japan	Tochigi-ken Nanbu Suiden-chitai	400	19 May 05	*114*
216	Japan	Obitsu-gawa Kakou	369	16 Sep 91	*77*
194	Japan	Kamo-gawa Kako	360	17 May 08	*114*
169	Japan	Chiri-hama	354	09 May 11	*114*

Table continues

Grey-tailed Tattler *Sites of international importance (1% = 440; 0.25% = 110), continued.*

Site	Country	Name	Max Count	Date	Ref.
331	South Korea	Namhae	347	12 Aug 98	*146*
187	Japan	Inner Tokyo Bay	336	15 Sep 01	*224*
170	Japan	Daijugarami	321	21 May 05	*114*
202	Japan	Kuma-gawa Kako	321	10 May 89	*77*
226	Japan	Shira-kawa Kako	293	24 May 03	*114*
227	Japan	Sone Higata (Sone-Higata Tideland)	278	01 May 98	*118*
99	China	Huang He Delta Nature Reserve	253	09 Sep 91	*208*
164	Japan	Anogawa & Shitomogawa Estuaries, Toyotsuura	237	17 May 11	*114*
225	Japan	Shiraho, Miyara-wan	224	15 Sep 98	*116*
236	Japan	Usa Kaigan	204	01 May 97	*115*
177	Japan	Hakata-wan Tobu (Wajiro, Tatara)	202	09 May 04	*114*
181	Japan	Hikawa Estuary, Shiranui	202	11 May 10	*114*
211	Japan	Nakatsu Kaigan (Higashi-hama)	200	01 May 02	*222*
233	Japan	Tofutsu-ko	196	06 Aug 11	*114*
198	Japan	Kikuchi-gawa Kakou	185	08 May 95	*77*
237	Japan	Wajiro Higata	182	01 May 01	*224*
238	Japan	Wakkanai-shi Koetoi	181	24 May 05	*114*
204	Japan	Man-ko	168	24 Aug 96	*77*
231	Japan	Ten-no Kaigan	162	16 May 06	*114*
318	South Korea	Geum River Estuary (incl. Yubu Island)	161	22 May 98	*146*
166	Japan	Awase Higata	154	10 Aug 04	*114*
217	Japan	Okina Higata	151	01 May 97	*115*
175	Japan	Futtsu	150	01 May 98	*118*
221	Japan	Saroma-ko	142	10 Aug 96	*77*
171	Japan	Daimyoujin-gawa Kakou	138	01 May 98	*118*
179	Japan	Hayatsue-gawa Kako (Kawasoe-machi)	135	07 May 11	*114*
212	Japan	Nanko Yachoen	132	23 May 05	*114*
190	Japan	Izumi Kantaku	131	10 May 92	*77*
184	Japan	Ikawazu	125	01 May 00	*223*
235	Japan	Umeda-gawa Kakou	125	08 Aug 96	*77*
195	Japan	Kashima Shingomori Kaigan	122	15 May 03	*114*

RUDDY TURNSTONE
ARENARIA INTERPRES INTERPRES

EAAF population size: **28,500**
EAAF population trend: **Strong decline**
Global Red List status: **Least Concern**

8

Although its global population is thought to be generally declining, the Ruddy Turnstone is currently considered a species of Least Concern, due to its worldwide distribution, large population, and conflicting trends among flyway populations[31]. However, the species is a candidate for upgrading to Near Threatened status based on steep declines in East Asia[133]. The population using the EAAF appears to be sufficiently declining to qualify for Vulnerable status at the regional level (criterion A2). However, lack of phenotypic differentiation from other flyways suggests exchange of individuals from other (possibly non-declining) populations, and so a downgraded regional status of **Near Threatened** has been recommended[80].

Taxonomy

Two subspecies are recognized: *A. i. morinella*, which breeds in northeast Alaska through most of the Canadian Arctic, and *A. i. interpres*, which breeds across Eurasia, Greenland, northern Canadian Arctic, and western Alaska. A small portion of *A. i. interpres* uses the EAAF.

Population

Size: preliminary current population estimate of 28,500[210] derived by applying observed flyway declines[80] to previous population estimate of 35,000[8].

Trend: non-breeding surveys in Australia have indicated a population decline of 30–49% in three generations (22 years)[80]. Numbers passing through Japan on southward migration have declined more rapidly (by 65% during 1998–2008)[1]. Non-breeding numbers have severely declined in New Zealand[159].

Distribution

Breeding: Arctic northeastern Siberia and western Alaska.

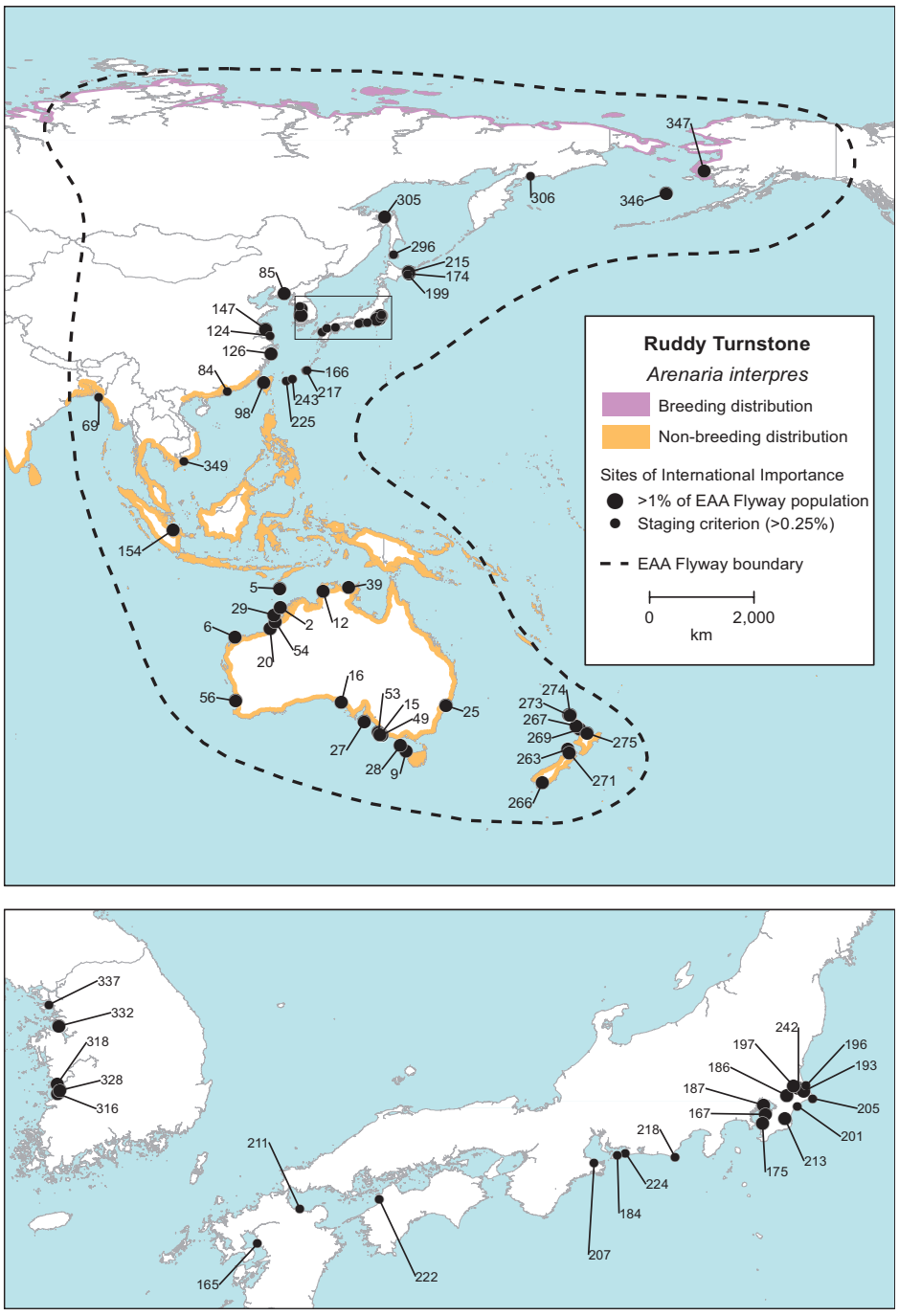
Non-breeding: approximately 60% of the flyway population in Australia, with the remainder in coastal China (including Taiwan), Southeast Asia, Indonesia, Papua New Guinea, and New Zealand. High fidelity to non-breeding sites. Most immature birds remain in non-breeding grounds during breeding season.

Migration: Count data show significant movements through Japan on both northward and southward migration, but use of the Korean Peninsula is concentrated in southward migration. Geolocator-tracked birds from southern Australia migrated north in a narrow corridor through coastal eastern Asia, but took widely divergent routes on southward migration, spanning from Mongolia to the central Pacific[140]. Birds from southern Australian non-breeding sites overfly northern Australia on both migrations, with some taking long non-stop flights to and from mainland Asia, and others traveling in a series of shorter flights with stops in the Philippines, Indonesia, or Papua New Guinea[140]. At least some birds migrating from New Zealand stop in northwest Australia on northward migration[159].

Habitat

Breeding: coastal plains, marshes, and tundra in the High Arctic up to 10 km from coast[122].

Ruddy Turnstone
Range and sites of international importance. Site details on next page.



Non-breeding and migration: mainly coastal and estuarine, but occasionally inland. On exposed reefs and tidal flats, sandy beaches with washed-up seaweeds, mangrove swamps, sheltered inlets, salt-marshes, and rocky and shingle shores.

Major Threats

Generally threatened by coastal wetland loss and degradation through reclamation, pollution, disturbance, and reduced river flows. Unknown threats in the breeding season.

Ruddy Turnstone *Sites of international importance (1% = 285; 0.25% = 71).*

Site	Country	Name	Max Count	Date	Ref.
20	Australia	Eighty Mile Beach	3,480	17 Oct 98	*5*
9	Australia	Boullanger Bay/Robbins Passage	2,800	01 Feb 98	*6*
174	Japan	Furen-ko	2,105	20 May 12	*114*
54	Australia	Roebuck Bay	2,060	<1988	*121*
		updated count	***1,169***	***01 Dec 05***	*6*
85	China	Yalujiang National Nature Reserve, Liaoning	1,994	20 May 00	*14*
263	New Zealand	Farewell Spit	1,792	1983–1994	*182*
		updated count	***1,028***	***15–16 Nov 08***	*160*
6	Australia	Barrow Island	1,733	10 Mar 04	*11*
5	Australia	Ashmore Reef	1,708	01 Feb 05	*193*
29	Australia	Lacepede Islands	1,708	02 Feb 03	*218*
332	South Korea	Namyang Bay	1,533	01 Sep 97	*229*
273	New Zealand	Parengarenga Harbour	1,500	1983–1994	*182*
		updated count	***250***	***09 Nov 07***	*160*
215	Japan	Notsuke-zaki, Odaito	1,452	05 May 10	*114*
28	Australia	King Island	1,252	01 Jan 93	*6*
2	Australia	Adele Island	1,250	21 Nov 04	*37*
347	USA	Yukon-Kuskokwim Delta	1,200	May–Jun 01–02	*137*
266	New Zealand	Invercargill – Awarua Bay	1,150	1983–1994	*182*
		updated count	***248***	***27 Nov 05***	*160*
147	China	Yancheng Nature Reserve	919	01 Oct 90	*204*
242	Japan	Yodaura Suiden	902	06 May 06	*114*
269	New Zealand	Manukau Harbour	803	1983–1994	*182*
		updated count	***348***	***05 Nov 06***	*160*
193	Japan	Kamisu-Chou Takahama	761	05 May 98	*118*
318	South Korea	Geum River Estuary (incl. Yubu Island)	695	Mid-May 06	*175*
267	New Zealand	Kaipara Harbour	618	1983–1994	*182*
		updated count	***386***	***05 Nov 05***	*160*
53	Australia	Rivoli Bay	616	02 May 84	*6*
305	Russia	Schastiya Bay	573	01 Sep 02	*4*
154	Indonesia	Banyuasin Delta	560	01 Oct 88	*202*
187	Japan	Inner Tokyo Bay	553	01 May 98	*118*
		updated count	***412***	***29 Apr 10***	*114*
186	Japan	Inba-numa, Inbanuma-Cyuuouhaisuiro	542	01 May 98	*118*
25	Australia	Hunter Estuary	520	<1991	*188*
98	China	Han-Pao, Changhua	500	01 Jan 91	*214*

Table continues

Knowledge Gaps Causes for observed population decline are unknown. Estimates of numbers migrating in the EAAF are complicated by an unknown degree of mixing with birds from the Central Pacific Flyway, and some individuals that use both flyways[140].

General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3034

Ruddy Turnstone *Sites of international importance (1% = 285; 0.25% = 71), continued.*

Site	Country	Name	Max Count	Date	Ref.
126	China	Sanmen Wan	500	20 Jan 95	*214*
346	USA	Pribilof Islands	500	14 Aug 10	*134*
56	Australia	Rottnest Island	480	1981–1984	*183*
39	Australia	Milingimbi Coast	456	<2001	*44*
27	Australia	Kangaroo Island	450	01 Jan 88	*6*
316	South Korea	Dongjin River Estuary	450	01 May 98	*229*
49	Australia	Port MacDonnell Coast	443	31 Jan 86	*6*
15	Australia	Carpenter Rocks, Pelican Point	438	02 Nov 83	*6*
213	Japan	Naruto-machi Suiden	437	01 May 98	*118*
271	New Zealand	Motueka Estuary	434	1983–1994	*182*
		updated count	***400***	***Feb 00***	*160*
167	Japan	Banzu	430	15 Sep 01	*224*
275	New Zealand	Tauranga Harbour	402	1983–1994	*182*
		updated count	***182***	***03 Nov 12***	*160*
328	South Korea	Mangyung River Estuary	400	01 May 98	*229*
16	Australia	Ceduna Bays	385	01 Feb 00	*219*
274	New Zealand	Rangaunu Harbour	372	1983–1994	*182*
		updated count	***230***	***15 Nov 08***	*160*
197	Japan	Kasumigaura Nangan Inashiki-shi Ukishima	356	18 May 09	*114*
12	Australia	Bynoe Harbour	350	15 Sep 99	*45*
175	Japan	Futtsu	300	01 May 98	*118*
84	China	Deep Bay (incl. Mai Po & Futian)	268	20 Apr 94	*102*
		updated count	***102***	***20 Apr 01***	*102*
224	Japan	Shio-kawa Higata	239	01 May 00	*223*
124	China	Rudong Mudflats	200	01 May 10	*46*
337	South Korea	Yeongjong Island	180	01 May 97	*229*
184	Japan	Ikawazu	178	01 May 98	*118*
165	Japan	Arao Kaigan	176	27 Apr 08	*114*
217	Japan	Okina Higata	171	01 May 98	*118*
205	Japan	Matsugishi-higata	156	01 May 98	*118*
166	Japan	Awase Higata	152	05 Sep 03	*114*
306	Russia	Skobeleva Bay	145	25 May 98	*85*
207	Japan	Miyagawakakou, Sotoshirotagawakakou	144	04 May 98	*118*
218	Japan	Omaezaki-kaigan	134	04 May 96	*77*
201	Japan	Kujukuri Coast	133	06 May 11	*114*
225	Japan	Shiraho, Miyara-wan	133	15 Sep 98	*116*
196	Japan	Kashima-nada	108	14 May 06	*114*
349	Vietnam	Hoa Trinh	103	01 Apr 00	*147*
211	Japan	Nakatsu Kaigan (Higashi-hama)	101	01 May 98	*118*
296	Russia	Lososei Bay	100	30 May 79	*154*
222	Japan	Shigenobu-gawa Kako	98	01 May 93	*77*
69	Bangladesh	Sonadia & Moheskhali Island	93	13–19 Mar 12	*51*
199	Japan	Kiritappu Shitsugen	93	16 May 96	*77*
243	Japan	Yonaha-wan	93	15 Sep 01	*224*

ASIAN DOWITCHER
LIMNODROMUS SEMIPALMATUS

EAAF population size: **23,000**

EAAF population trend: **Suspected decline**

Global Red List status: **Near Threatened**

9

This endemic species is considered globally **Near Threatened** based on suspected current and future declines due to threats to both breeding and non-breeding habitats, and because the population size is thought to be quite small (potential future qualification for Vulnerable status based on criteria A/C)[31]. However, there is insufficient data to estimate current population size or trend.

Taxonomy

Monotypic species endemic to EAAF.

Population

Size: due to lack of new data, the estimated population size of 23,000 has not been revised since 2002[64].

Trend: insufficient data exist to evaluate suspected population declines due to habitat degradation on the flyway[15,148].

Distribution

Breeding: disjunct breeding range in steppe regions of northeastern China, Mongolia, and southern Siberia.

Non-breeding: approximately 85% of the population in Indonesia, with small numbers found at coastal sites in, Southeast Asia, Philippines, Papua New Guinea, and northern Australia. Some birds (presumably immature) remain on non-breeding grounds during the breeding season.

Migration: northward and southward migration appear to follow similar routes through eastern Russia, China, and Southeast Asia. It is unclear how much of the population uses the Yellow Sea: minimally 14%[8], but perhaps as much as 40%[15]. The Banyuasin Delta of Sumatra appears particularly important during both migration and non-breeding periods. In Hong Kong, a common spring migrant, but scarce in autumn[43].

Habitat

Breeding: nests among reeds in shallow water or in the open. In the steppe and forest-steppe zones, uses a variety of freshwater wetlands such as lake shores, river deltas, flooded meadows, rice fields, grassy bogs along shores of rivers, and alkaline ponds. Often breeds semi-colonially with White-winged Terns *Chlidonias leucopterus*.

Non-breeding and migration: tidal flats, estuaries, coastal lagoons, creeks, and saltpans. Will roost on sandy beaches or in shallow lagoons.

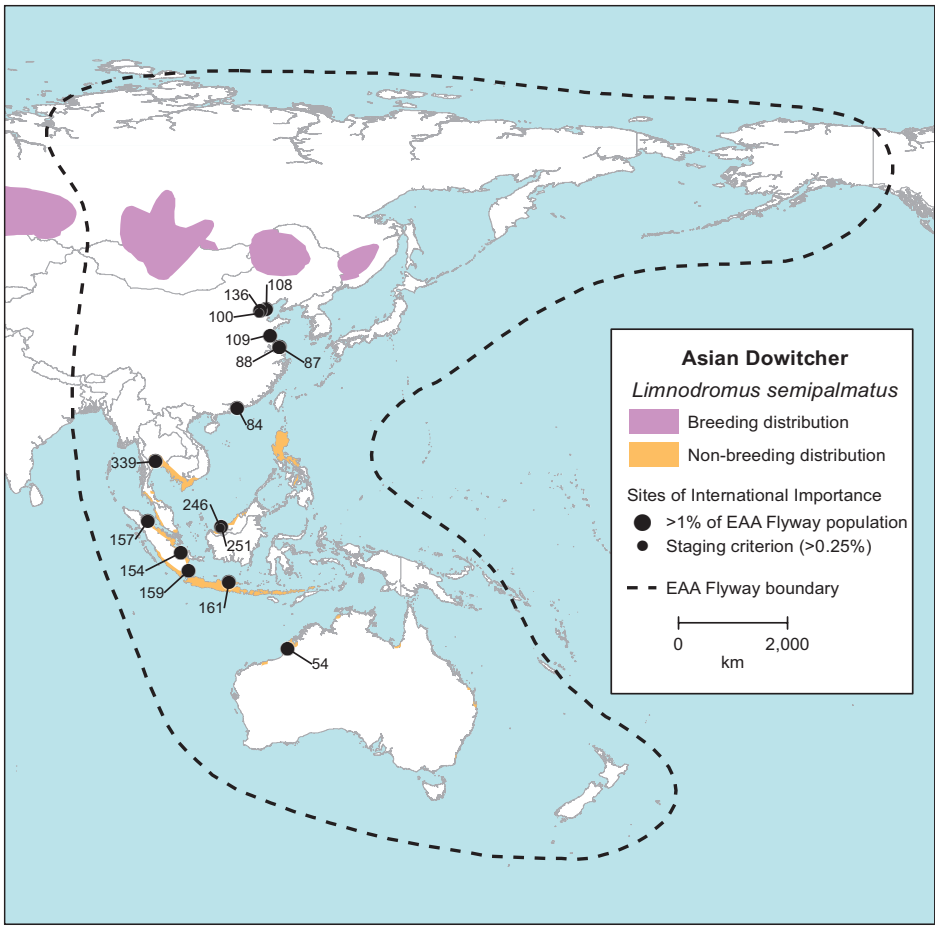
Major Threats

Vulnerable to threats in both breeding and non-breeding range. Inland wetland breeding habitat is threatened by drying due to climate change and drainage for agriculture. Coastal migratory and non-breeding sites are threatened by destruction and degradation through reclamation, pollution, disturbance, and reduced river flows.

Knowledge Gaps

Life history and migratory movements poorly described. No current data on population size or population trend.

Asian Dowitcher
Range and sites of international importance. Site details below.



General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3038

Asian Dowitcher *Sites of international importance (1% = 230; 0.25% = 58).*

Site	Country	Name	Max Count	Date	Ref.
154	Indonesia	Banyuasin Delta	13,000	01 Nov 88	*202*
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	6,970	28 Mar 02	*57*
109	China	Lianyungang Coast	2,800	12 May 13	*46*
87	China	Dongsha Shoals	1,320	01 Sep 97	*205*
108	China	Laoting (Daqinghe – Shijiutuo)	1,100	12 May 94	*15*
136	China	Tianjin Coast	966	12 Apr 00	*17*
		updated count	***420***	***01 Aug 10***	*46*
161	Indonesia	Ujung Pangkah	930	18 Jan 90	*214*
88	China	Dongtai (Zhou Gang – Qiang Gang Coast)	840	01 Sep 97	*15*
159	Indonesia	Sekopong Bay	625	29 Nov 09	*109*
339	Thailand	Inner Gulf of Thailand	600	22 Apr 89	*179*
84	China	Deep Bay (incl. Mai Po & Futian)	540	02 May 03	*102*
251	Malaysia	Pulau Bruit	470	01 Sep 85	*74*
54	Australia	Roebuck Bay	414	30 Mar 00	*173*
100	China	Huanghua Coast (Cangzhou)	92	01 Aug 11	*46*
246	Malaysia	Baton, Belawai	63	01 Mar 11	*7*

GREAT KNOT
CALIDRIS TENUIROSTRIS

EAAF population size: **290,000**
EAAF population trend: **Strong decline**
Global Red List status: **Vulnerable**

10

The IUCN global Red List status of the Great Knot was upgraded from Least Concern to Vulnerable in 2010 due to a rapid population decline associated with the reclamation of intertidal staging grounds in the Yellow Sea[149], and recognition that further proposed reclamation projects will exacerbate this decline[31]. The Great Knot is a candidate for Appendix I and the list of Concerted Action Species of the Convention on Migratory Species[55]. As a flyway endemic, the population qualifies for **Vulnerable** status at both global and regional level under IUCN Red List criterion A3/4[80]. It is particularly vulnerable to loss of staging sites, due to high concentration at very few sites.

Taxonomy

Monotypic species endemic to EAAF.

Population

Size: 290,000, based on 2007 census data[215].

Trend: the current population estimate of 290,000 differs markedly from the previous estimate of 380,000[8], and reflects the well-documented loss of approximately 90,000 Great Knots following the catastrophic loss of habitat at a major staging site at Saemangeum, South Korea in 2006[149]. Non-breeding surveys in Australia have indicated a long-term population decline of 30–49% in three generations (22 years)[80]. Great Knot numbers have increased in Malaysia[6.1] and Thailand[180] during the last decade, and in northwestern Australia since 2008[174]; however, as no similar increases have occurred elsewhere in Australia[142,217], it is unclear whether this represents a change in trend, a temporary density-dependent correction, or a redistribution of the non-breeding population.

Distribution

Breeding: northeast Siberia, north of the Kamchatka Peninsula. High fidelity to breeding sites.

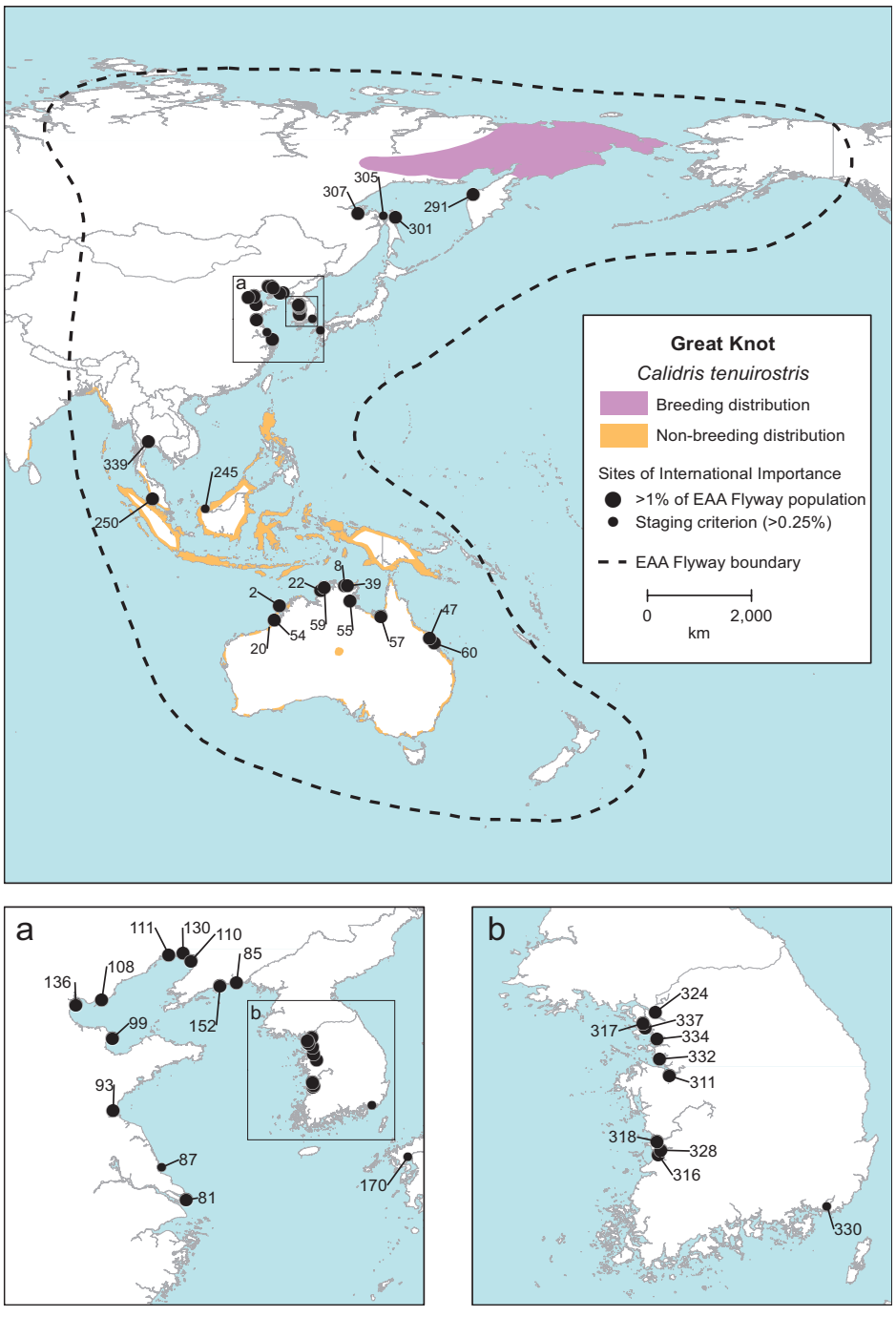
Non-breeding: more than 90% of the population in Australia, primarily at sites along the northern coast. The remainder found mostly in Southeast Asia, the Philippines, and Papua New Guinea, but also small numbers west to Indian subcontinent and Arabian Peninsula. Non-breeders and first-year birds often remain in the tropical part of the non-breeding range during the breeding season.

Migration: an estimated 80% of the population passes through the Yellow Sea on northward migration, but much lower numbers on southward migration. Most northbound birds fly non-stop from non-breeding grounds to Yellow Sea staging areas, but small passage numbers recorded in Japan, Philippines, Vietnam, Thailand, Malaysia, and Indonesia. Flight from Yellow Sea to breeding grounds is direct. Pre-breeding moult, initiated at non-breeding grounds, is completed at northward staging sites[22]. Although some post-breeding birds use the Yellow Sea, most migrate south via the Sea of Okhotsk, where they stage for a non-stop flight to non-breeding grounds.

Habitat

Breeding: breeds in gravelly areas covered with a mosaic of lichen and vegetation, on rocky plateaus and gentle slopes of montaine tundra (300–1,600 m elevation).

Great Knot
Range and sites of international importance. Site details on next page.



Non-breeding and migration: coastal tidal flats and sandbanks in estuaries, river deltas, inlets, lagoons, bays, and harbours. Roosts on sandy spits, islets, saltflats among mangroves and in coastal dunes, often in shallow water. Rarely uses inland wetlands.

Major Threats

Survival analysis of birds marked in northwest Australia indicates a sharp decline in adult survival, particularly during summer, since 2010[167]. Threatened by destruction and degradation of intertidal staging sites in the Yellow Sea, through

Great Knot *Sites of international importance (1% = 2,900; 0.25% = 725).*

Site	Country	Name	Max Count	Date	Ref.
20	Australia	Eighty Mile Beach	169,044	01 Nov 01	*143*
130	China	Shuangtaizihekou National Nature Reserve	83,000	Late Apr 13	*138*
57	Australia	SE Gulf of Carpentaria	72,333	01 Mar 99	*71*
316	South Korea	Dongjin River Estuary	60,000	01 May 98	*229*
328	South Korea	Mangyung River Estuary	59,000	03 May 99	*15*
85	China	Yalujiang National Nature Reserve, Liaoning	54,178	02 May 99	*14*
311	South Korea	Asan Bay	34,000	<2003	*15*
54	Australia	Roebuck Bay	30,361	01 Dec 10	*6*
318	South Korea	Geum River Estuary (incl. Yubu Island)	29,838	Mid-May 06	*175*
55	Australia	Roper River Area	21,400	<1988	*121*
332	South Korea	Namyang Bay	21,000	01 May 98	*229*
111	China	Linghekou, Jin, Liaoning	17,540	29 Apr 99	*13*
152	China	Zhuanghe East Coast	15,300	May 05	*19*
99	China	Huang He Delta Nature Reserve	12,816	27 Apr 98	*230*
301	Russia	Odoptu Gulf	11,500	09 Jul 09	*197*
22	Australia	Fog Bay	10,000	25 Dec 92	*45*
307	Russia	Tugurskiy Bay	9,750	28 Aug 90	*168*
334	South Korea	Songdo Tidal Flat	8,000	2006–2010	*34*
324	South Korea	Han River Estuary	7,700	01 May 00	*184*
110	China	Laobian – Yingkou Coast, Liaoning	7,330	04–05 May 05	*19*
93	China	Ganyu Coast	6,700	02 May 04	*18*
337	South Korea	Yeongjong Island	6,000	01 Sep 98	*229*
81	China	Chongming Dongtan National Nature Reserve	5,761	31 Mar 96	*12*
8	Australia	Boucat Bay	5,500	25 Mar 99	*45*
59	Australia	Shoal Bay: Tree Pt to Lee Pt (Hope Inlet)	5,500	07 Nov 82	*6*
339	Thailand	Inner Gulf of Thailand	5,000	02 Nov 12	*180*
39	Australia	Milingimbi Coast	4,500	31 Mar 99	*45*
291	Russia	Khairyuzova Bay	4,500	23 Jul 83	*131*
60	Australia	Shoalwater Bay & Broad Sound	4,200	<1988	*121*

Table continues

	reclamation, pollution, disturbance, and reduced river flows. Uses few staging sites in very high concentrations, making it particularly vulnerable to site loss.
Knowledge Gaps	Despite a long-term population decline, recently increasing numbers in Malaysia, Thailand, and northwestern Australia suggest that some redistribution of the non-breeding population may have occurred; this requires confirmation. Precise mechanism for decreasing adult summer survival requires more study. Degree of dependence on key staging sites unknown.
General Information	http://www.birdlife.org/datazone/speciesfactsheet.php?id=3040

Great Knot *Sites of international importance (1% = 2,900; 0.25% = 725), continued.*

Site	Country	Name	Max Count	Date	Ref.
47	Australia	Pioneer River – McEwan's Beach	4,000	<1988	*121*
108	China	Laoting (Daqinghe – Shijiutuo)	4,000	13 May 94	*15*
250	Malaysia	North-central Selangor Coast	3,700	23 Mar 12	*33*
136	China	Tianjin Coast	3,610	12 Apr 00	*17*
317	South Korea	Ganghwa Tidal Flat	3,300	01 May 98	*229*
2	Australia	Adele Island	2,945	21 Nov 04	*37*
87	China	Dongsha Shoals	2,206	01 Sep 97	*205*
245	Malaysia	Bako-Buntal Bay	1,800	27 Oct 11	*7*
305	Russia	Schastiya Bay	1,374	01 Sep 02	*4*
330	South Korea	Nakdong Estuary	1,240	01 Sep 83	*184*
170	Japan	Daijugarami	780	28 Sep 03	*114*

© John & Jemi Holmes. *Mai Po in Deep Bay, Hong Kong (Site #84)*

The **Great Knot** represents a rare case in which an observed population decline could be attributed largely to habitat changes at a particular location. One year after the Saemangeum reclamation project in South Korea effectively destroyed their primary Yellow Sea staging site in 2006, the Great Knot population had dropped by approximately 90,000 birds.

RED KNOT
CALIDRIS CANUTUS ROGERSI

EAAF population size: **50,500–62,000**
EAAF population trend: **Strong decline**
Global Red List status: **Least Concern**

11

The Red Knot is currently considered a species of Least Concern according to IUCN Red List criteria[31]. However, the species is a candidate for upgrading to Near Threatened or Vulnerable status based on observed declines worldwide[133], and is proposed as a Concerted Action Species of the Convention on Migratory Species[55]. Populations in the EAAF qualify for **Vulnerable** status at the regional level (criterion A3/4), due to substantial documented declines in the flyway, and recognition that further proposed degradation of intertidal staging habitats, particularly in the Bohai Bay region of the Yellow Sea, will perpetuate and probably exacerbate this decline[80]. The species has been listed as 'Vulnerable' in New Zealand[172]. The flyway populations are particularly threatened by its intense concentration at very few sites on migration through the Yellow Sea region.

Taxonomy

Six global subspecies are recognized. Two of these (*C. c. piersmai* and *rogersi*) are endemic to the EAAF. A third subspecies (*C. c. roselaari*) breeds in both Alaska and Wrangel Island, but migrates exclusively along the American Pacific Flyway.

Population

Size: based on non-breeding surveys, the combined population estimate for *C. c. piersmai* and *rogersi* was recently revised to 105,000[176], less than half of the previous estimate of 220,000[8]. It is estimated that 50,500–62,000 of these belong to the subspecies *C. c. rogersi*[176].

Trend: non-breeding surveys in Australia have indicated a population decline of at least 30–49% in three generations (27 years) for both *C. c. piersmai* and *rogersi*[80], although this decline may be accelerating given the rapid and widespread reclamation of staging sites in the Bohai Bay region of the Yellow Sea[176].

Distribution

Breeding: far eastern Siberian Arctic to Chukotka.

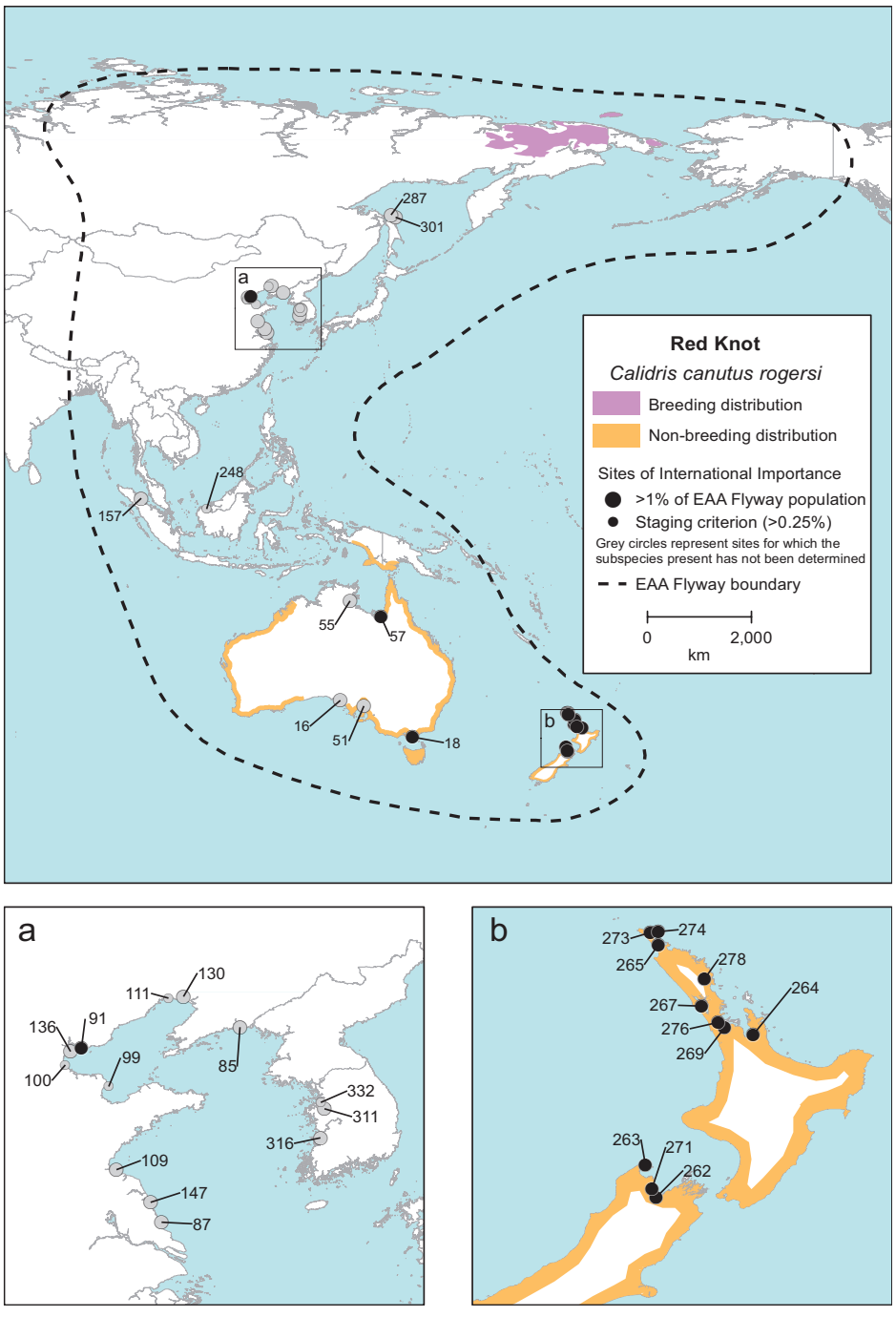
Non-breeding: approximately 75% in New Zealand and 25% in (primarily eastern) Australia. Substantial within-season movements within and between Australia and New Zealand, particularly by subadults[23,141]. Immature birds and non-breeders often remain in the non-breeding range all year.

Migration: counts have thus far identified no important sites between Australia and eastern China. On northward migration, most individuals probably make non-stop flights between non-breeding grounds and staging sites in the Yellow Sea, but some birds from New Zealand stage in the Gulf of Carpentaria, Australia[200] or stop elsewhere prior to reaching mainland Asia[25]. The northward flight from the Yellow Sea to the breeding area is generally direct, but many post-breeding birds stage in the Sea of Okhotsk on southward migration[200]. High fidelity to migratory staging sites[96-97].

Habitat

Breeding: rocky or gravelly areas in open dry, upland tundra in the high Arctic; including sandstone ridges, areas with scattered willows, moist marshy slopes and flats in foothills, and glacial gravel close to streams or ponds. This subspecies occurs mostly in gravelly, partly overgrown flats in subalpine areas up to 700 m[122].

Red Knot (*C. c. rogersi*)
Range and sites of international importance. Non-breeding range is shown for C. c. piersmai and rogersi. Site details on next page.



Non-breeding and migration: strictly coastal; mostly tidal flats, but also sandy beaches, rocky shelves, bays, lagoons and harbours, occasionally oceanic beaches and saltmarsh.

Major Threats

Threatened by destruction and degradation of intertidal winter and staging areas, particularly in Yellow Sea, through reclamation, pollution, disturbance, and reduced river flows. Highly concentrated at a few major sites during both northward and southward migration. Due to loss of staging habitat in Bohai Bay, more than 60% of the flyway population is concentrated on a small area of

Red Knot (*C. c. rogersi*) *Sites of international importance (1% = 505; 0.25% = 126).*

Site	Country	Name	Max Count	Date	Ref.
91	China	Luannan Coast & Saltworks	29,500	13 May 11	*95*
263	New Zealand	Farewell Spit	24,227	1983–1994	*182*
		updated count	***12,416***	***15–16 Nov 08***	*160*
57	Australia	SE Gulf of Carpentaria	23,657	01 Mar 99	*71*
269	New Zealand	Manukau Harbour	22,433	1983–1994	*182*
		updated count	***11,538***	***16 Nov 08***	*160*
267	New Zealand	Kaipara Harbour	16,910	1983–1994	*182*
		updated count	***11,683***	***05 Nov 05***	*160*
273	New Zealand	Parengarenga Harbour	13,500	1983–1994	*182*
		updated count	***3,500***	***09 Nov 07***	*160*
264	New Zealand	Firth of Thames	7,600	16 Nov 03	*160*
18	Australia	Corner Inlet	7,110	31 Jan 87	*6*
278	New Zealand	Whangarei Harbour	4,198	1983–1994	*182*
		updated count	***2,520***	***15 Nov 03***	*160*
274	New Zealand	Rangaunu Harbour	4,067	1994–2003	*190*
		updated count	***1,650***	***12 Nov 07***	*160*
276	New Zealand	Waitemata Harbour	4,000	14 Nov 04	*160*
265	New Zealand	Houhora Harbour	2,855	1983–1994	*182*
		updated count	***500***	***Nov 09***	*160*
262	New Zealand	East Waimea Inlet	600	10 Nov 09	*160*
271	New Zealand	Motueka Estuary	600	05 Nov 05	*160*

Red Knot (unknown population) *Sites of international importance (C. c. rogersi and piersmai combined: 1% = 990; 0.25% = 248).*

Site	Country	Name	Max Count	Date	Ref.
136	China	Tianjin Coast	14,277	12 Apr 00	*17*
87	China	Dongsha Shoals	8,140	01 Sep 97	*205*
130	China	Shuangtaizihekou National Nature Reserve	5,000	12 Aug 11	*95*
51	Australia	Port Pirie Coast	4,800	23 Jan 00	*219*

Table continues

mudflat, increasing the risk of population collapse[225]; furthermore, the very high suitability of this remaining area[226] may be an unexpected and temporary result of the collapse of the local shrimp fishery[227]. Particularly on northward migration, reduced food resources may threaten ability to fuel sufficiently for the flight to the breeding grounds[21].

Knowledge Gaps

Poorly studied in the breeding season. More knowledge required regarding dependence on key staging sites. Non-breeding population estimates are complicated by the impossibility of distinguishing the two EAAF subspecies in non-breeding plumage. Extent of overlap in non-breeding distribution of the two subspecies is poorly understood.

General Information

http://www.birdlife.org/datazone/speciesfactsheet.php?id=3041

Red Knot (unknown population) *Sites of international importance (C. c. rogersi and piersmai combined: 1% = 990; 0.25% = 248), continued.*

Site	Country	Name	Max Count	Date	Ref.
147	China	Yancheng Nature Reserve	3,169	<1998	*15*
55	Australia	Roper River Area	3,100	<1991	*79*
16	Australia	Ceduna Bays	2,788	01 Feb 00	*219*
109	China	Lianyungang Coast	2,500	14 Apr 13	*46*
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	2,434	14 Oct 10	*58*
301	Russia	Odoptu Gulf	2,000	09 Jul 09	*197*
316	South Korea	Dongjin River Estuary	1,500	01 May 98	*229*
85	China	Yalujiang National Nature Reserve, Liaoning	1,499	02 May 99	*14*
99	China	Huang He Delta Nature Reserve	1,300	01 Sep 10	*46*
287	Russia	Baikal Bay	1,000	10 Aug 79	*154*
311	South Korea	Asan Bay	1,000	01 May 98	*229*
111	China	Linghekou, Jin, Liaoning	969	29 Apr 99	*13*
100	China	Huanghua Coast (Cangzhou)	788	01 Apr 11	*46*
332	South Korea	Namyang Bay	580	01 May 97	*229*
248	Malaysia	Kuala Samarahan – Kuala Sadong	330	10 Apr 05	*33*

RED KNOT
CALIDRIS CANUTUS PIERSMAI

EAAF population size: **48,500–60,000**
EAAF population trend: **Strong decline**
Global Red List status: **Least Concern**

12

The Red Knot is currently considered a species of Least Concern according to IUCN Red List criteria[31]. However, the species is a candidate for upgrading to Near Threatened or Vulnerable status based on observed declines worldwide[133], and is proposed as a Concerted Action Species of the Convention on Migratory Species[55]. Populations in the EAAF qualify for **Vulnerable** status at the regional level (criterion A3/4), due to substantial documented declines in the flyway, and recognition that further proposed degradation of intertidal staging habitats, particularly in the Bohai Bay region of the Yellow Sea, will perpetuate and probably exacerbate this decline[80]. The species has been listed as 'Vulnerable' in New Zealand[172]. The flyway populations are particularly threatened by its intense concentration at very few sites on migration through the Yellow Sea region.

Taxonomy

Six global subspecies are recognized. Two of these (*C. c. piersmai* and *rogersi*) are endemic to the EAAF. A third subspecies (*C. c. roselaari*) breeds in both Alaska and Wrangel Island, but migrates exclusively along the American Pacific Flyway.

Population

Size: based on non-breeding surveys, the combined population estimate for *C. c. piersmai* and *rogersi* was recently revised to 105,000[176], less than half of the previous estimate of 220,000[8]. It is estimated that 48,500–60,000 of these belong to the subspecies *C. c. piersmai*[176].

Trend: non-breeding surveys in Australia have indicated a population decline of at least 30–49% in three generations (27 years) for both *C. c. piersmai* and *rogersi*[80], although this decline may be accelerating given the rapid and widespread reclamation of staging sites in the Bohai Bay region of the Yellow Sea[176].

Distribution

Breeding: New Siberian archipelago of the Russian Arctic.

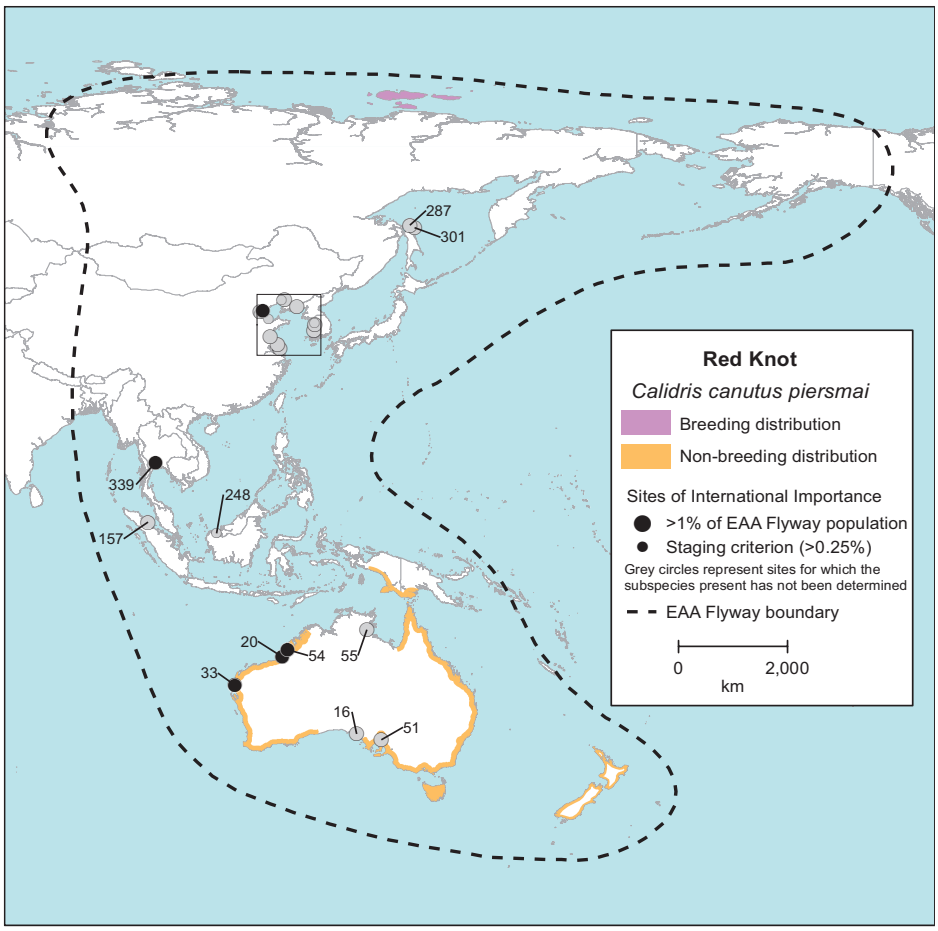
Non-breeding: approximately 75% in (primarily northwestern) Australia and 25% in New Zealand. Substantial within-season movements within and between Australia and New Zealand, particularly by subadults[23,141]. Immature birds and non-breeders often remain in the non-breeding range all year.

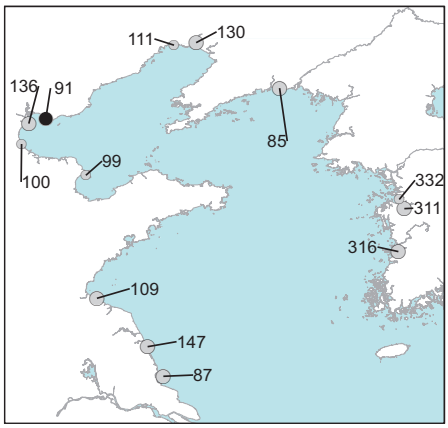
Migration: counts have thus far identified no important sites between Australia and eastern China. On northward migration, many individuals probably make non-stop flights between non-breeding grounds and staging sites in the Yellow Sea, but some Australian birds appear to make intermediate stops in Indonesia or the Philippines[99]. Some birds from New Zealand stage in the Gulf of Carpentaria, Australia[200] or stop elsewhere prior to reaching mainland Asia[25]. The northward flight from the Yellow Sea to the breeding area is probably direct, but post-breeding birds may stage in the Sea of Okhotsk on southward migration[200]. High fidelity to migratory staging sites[96-97].

Habitat

Breeding: rocky or gravelly areas in open dry, tundra in the high Arctic; including sandstone ridges, areas with scattered willows, moist marshy slopes and flats in foothills, well-drained slopes with hummocks, and glacial gravel close to streams or ponds. This subspecies breeds at low elevations, below 180 m[122].

Red Knot (*C. c. piersmai*)
Range and sites of international importance. Non-breeding range is shown for C. c. piersmai and rogersi. Site details on next page.





Non-breeding and migration: strictly coastal; mostly tidal flats, but also sandy beaches, rocky shelves, bays, lagoons and harbours, occasionally oceanic beaches and saltmarsh.

Major Threats

Survival analysis of birds marked in northwest Australia indicates a sharp decline in adult survival, particularly during outside the non-breeding season, since 2010[167]. Threatened by destruction and degradation of intertidal winter and staging areas, particularly in Yellow Sea, through reclamation, pollution, disturbance, and reduced river flows. Highly concentrated at a few major sites during both

Red Knot (*C. c. piersmai*) *Sites of international importance (1% = 485; 0.25% = 121).*

Site	Country	Name	Max Count	Date	Ref.
20	Australia	Eighty Mile Beach	80,700	<1988	121
		updated count	***32,923***	***01 Nov 12***	143
91	China	Luannan Coast & Saltworks	37,000	13 May 11	95
54	Australia	Roebuck Bay	11,200	<1988	121
		updated count	***5,345***	***01 Nov 12***	6
33	Australia	Lake MacLeod	2,566	28 Sep 87	113
		updated count	***668***	***01 Oct 03***	81
339	Thailand	Inner Gulf of Thailand	710	Apr 11	28

Red Knot (unknown population) *Sites of international importance (C. c. rogersi and piersmai combined: 1% = 990; 0.25% = 248).*

Site	Country	Name	Max Count	Date	Ref.
136	China	Tianjin Coast	14,277	12 Apr 00	*17*
87	China	Dongsha Shoals	8,140	01 Sep 97	*205*
130	China	Shuangtaizihekou National Nature Reserve	5,000	12 Aug 11	*95*
51	Australia	Port Pirie Coast	4,800	23 Jan 00	*219*
147	China	Yancheng Nature Reserve	3,169	<1998	*15*
55	Australia	Roper River Area	3,100	<1991	*79*
16	Australia	Ceduna Bays	2,788	01 Feb 00	*219*
109	China	Lianyungang Coast	2,500	14 Apr 13	*46*
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	2,434	14 Oct 10	*58*
301	Russia	Odoptu Gulf	2,000	09 Jul 09	*197*
316	South Korea	Dongjin River Estuary	1,500	01 May 98	*229*
85	China	Yalujiang National Nature Reserve, Liaoning	1,499	02 May 99	*14*

Table continues

northward and southward migration. Due to loss of staging habitat in Bohai Bay, more than 60% of the flyway population is concentrated on a small area of mudflat, increasing the risk of population collapse[225]; furthermore, the very high suitability of this remaining area[226] may be an unexpected and temporary result of the collapse of the local shrimp fishery[227]. Particularly on northward migration, reduced food resources may threaten ability to fuel sufficiently for the flight to the breeding grounds[21].

Knowledge Gaps

Poorly studied in the breeding season. More knowledge required regarding dependence on key staging sites. Precise mechanism for decreasing adult survival requires more study. Non-breeding population estimates are complicated by the impossibility of distinguishing the two EAAF subspecies in non-breeding plumage. Extent of overlap in non-breeding distribution of the two subspecies is poorly understood.

General Information

http://www.birdlife.org/datazone/speciesfactsheet.php?id=3041

Red Knot (unknown population) *Sites of international importance (C. c. rogersi and piersmai combined: 1% = 990; 0.25% = 248), continued.*

Site	Country	Name	Max Count	Date	Ref.
99	China	Huang He Delta Nature Reserve	1,300	01 Sep 10	*46*
287	Russia	Baikal Bay	1,000	10 Aug 79	*154*
311	South Korea	Asan Bay	1,000	01 May 98	*229*
111	China	Linghekou, Jin, Liaoning	969	29 Apr 99	*13*
100	China	Huanghua Coast (Cangzhou)	788	01 Apr 11	*46*
332	South Korea	Namyang Bay	580	01 May 97	*229*
248	Malaysia	Kuala Samarahan – Kuala Sadong	330	10 Apr 05	*33*

© Phil Battley, *Manawatu River Estuary, New Zealand*

Clear mechanisms for population declines are difficult to identify for migratory populations that span vast areas of the globe during the annual cycle. However, a steep drop in adult annual survival since 2010 has been associated with recent population declines in Australian populations of **Red Knot**, Great Knot, and Bar-tailed Godwit.

DUNLIN
CALIDRIS ALPINA ACTITES

EAAF population size: **900**
EAAF population trend: **Unknown**
Global Red List status: **Least Concern**

13

Due to its enormous population size and worldwide distribution, Dunlin is considered a species of Least Concern, despite evidence that the global population is declining[31]. The total number of Dunlin using the EAAF may be declining, but trend information for each of the four subspecies found in the flyway is lacking. The Alaska-breeding portion of the EAAF population (*C. a. arcticola*) may be significantly declining[3], but its large population size and uncertainty regarding the degree of decline prevent its qualification for regional Red List priority. However, the breeding population on Sakhalin Island (*C. a. actites*) qualifies for **Vulnerable** status at the regional Red List level, based on its very small population (<1,000; criterion D).

Taxonomy

Worldwide, nine subspecies of Dunlin are recognized, and four of these use the EAAF: *C. a. arcticola* breeds in northern Alaska; *C. a. sakhalin*a breeds in the Siberian Arctic, from the Kolyma River to Chukotka; *C. a. kistchinski* breeds around the Sea of Okhotsk, including Kamchatka and Kuril Islands; *C. a. actites* breeds on Sakhalin Island. All four populations are thought to be endemic to the flyway.

Population

Size: when first described as a new subspecies in 1987, the breeding population of *C. a. actites* was estimated to be approximately 300 pairs[155]. This led to a total flyway population estimate of 900[8], and there exist no new data with which to update this estimate.

Trend: no information specific to *C. a. actites*. In general, the EAAF population of Dunlin is thought to have declined, but the total flyway population estimate is too coarse for strong inference about trends in the species or in particular subspecies (although independent assessment of *C. a. arcticola* from the breeding grounds suggests a significant decline since 2001[3]). Non-breeding surveys in China led to a revision of the total flyway estimate from a minimum of 950,000[8] to approximately 650,000[41], but this is difficult to reconcile with the recent Alaska breeding population estimate of 500,000 (range 304,000–696,000) for *C. a. arcticola* alone[3]. It was thought that *C. a. sakhalina* and *kistchinski* could each be as numerous as *C. a. arcticola* on the flyway[8]; either this is not true or the total flyway population is significantly underestimated.

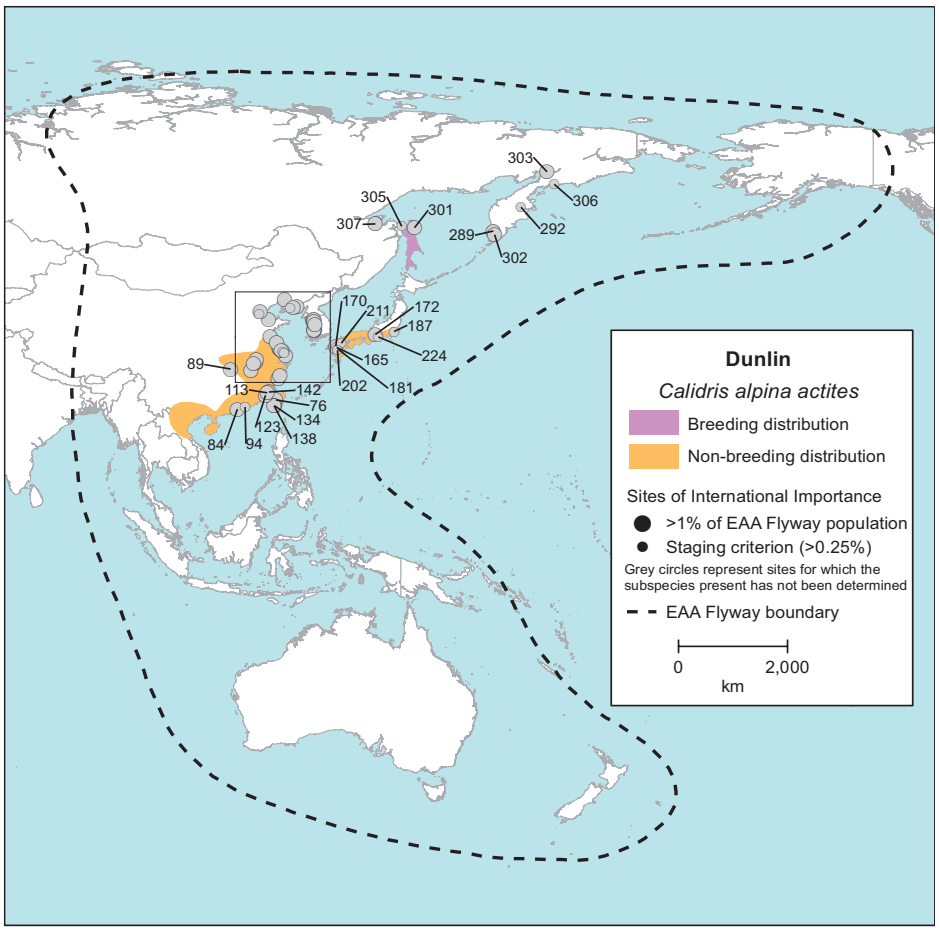
Distribution

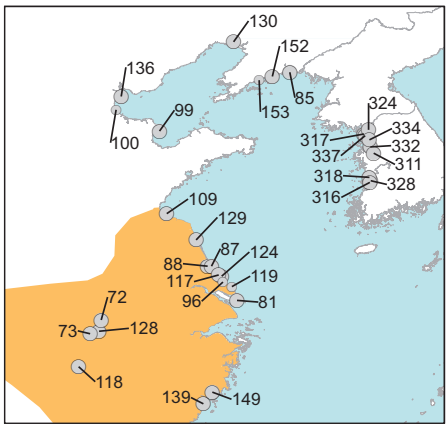
Breeding: C. a. actites breeds exclusively on Sakhalin Island. As with some other Dunlin subspecies, may complete post-breeding moult at the breeding grounds prior to southward migration[100,198].

Non-breeding: largely unknown for *C. a. actites*, although some individuals at Chongming Dongtan identified as *C. a. actites* based on bill length[49]. In general, Dunlin on the flyway use coastal China (including Taiwan), Korea, and Japan. Based on the small number of important non-breeding sites thus far identified, large portions of the non-breeding range may be at inland sites and undiscovered. Patterns of site fidelity unknown for this subspecies; in other subspecies, juveniles and non-breeders may remain in the non-breeding range year round.

Dunlin
(*C. a. actites*)

No important non-breeding or staging sites have been identified specifically for this population. Important sites and non-breeding range are shown for C. a. arcticola, actites, sakhalina, and kistchinski. Site details on next page.





Migration: unknown for *C. a. actites*. Large numbers of Dunlin pass through Kamchatka and the Sea of Okhotsk during southward migration, but far fewer during northward migration. The rest of eastern Russia is used by very large numbers on both migrations. It is thought that the majority of Dunlin passing through the Yellow Sea and Japan may be *C. a. arcticola*; other populations may skip the region or use more inland routes.

Habitat

Breeding: generally in moist tussock tundra and peat-hummock tundra. On Sakhalin this subspecies is found in coastal tundra-like bogs[122].

Dunlin (unknown population) *Sites of international importance (C. alpina all EAAF populations combined: 1% = 5,539; 0.25% = 1,385).*

Site	Country	Name	Max Count	Date	Ref.
109	China	Lianyungang Coast	63,805	2007	*127*
118	China	Poyang Lake (incl. nearby wetlands)	58,487	2007	*127*
328	South Korea	Mangyung River Estuary	47,650	19 Apr 99	*15*
81	China	Chongming Dongtan National Nature Reserve	47,500	Undated	*216*
318	South Korea	Geum River Estuary (incl. Yubu Island)	46,382	29 Apr 10	*60*
85	China	Yalujiang National Nature Reserve, Liaoning	43,875	13–23 Apr 06	*170*
303	Russia	Penzhina River Mouth*	40,172	07 Sep 03	*84*
316	South Korea	Dongjin River Estuary	38,850	01 May 98	*229*
289	Russia	Bolshoe Lake & Bolshaya River Mouth*	32,666	18 May 93	*82*
302	Russia	Opala River*	32,380	21 May 94	*82*
88	China	Dongtai (Zhou Gang – Qiang Gang Coast)	32,000	28 Apr 01	*16*
99	China	Huang He Delta Nature Reserve	24,106	21 Apr 97	*230*
89	China	East Dongting Lake Nature Reserve	23,488	05 Mar 01	*124*
317	South Korea	Ganghwa Tidal Flat	17,000	01 May 98	*229*
142	China	Xinghua Wan	16,965	Feb 06	*42*
337	South Korea	Yeongjong Island	16,800	01 Sep 92	*78*
130	China	Shuangtaizihekou National Nature Reserve	16,411	12 May 98	*20*
		updated count	***4,500***	***14 Aug 11***	*46*
324	South Korea	Han River Estuary	16,400	01 May 00	*184*
332	South Korea	Namyang Bay	15,200	16 Apr 99	*15*
334	South Korea	Songdo Tidal Flat	14,800	2006–2010	*34*
152	China	Zhuanghe East Coast	14,650	May 05	*19*
124	China	Rudong Mudflats	14,364	01 Apr 10	*46*
311	South Korea	Asan Bay	14,000	<2003	*15*
87	China	Dongsha Shoals	13,081	01 Sep 97	*205*
128	China	Shengjin Lake Nature Reserve	12,788	2007	*127*
307	Russia	Tugurskiy Bay	12,610	17 Sep 90	*168*

Table continues

Non-breeding and migration: tidal flats, estuarine mudflats, and a wide variety of freshwater and brackish wetlands, both coastal and inland, including salt pans.

Major Threats

Small population size of *C. a. actites* means that stochastic events may threaten its persistence. Intertidal staging and non-breeding sites threatened by reclamation, pollution, disturbance, and reduced river flows.

Knowledge Gaps

Almost nothing of the migration and non-breeding ecology of *C. a. actites* is known. Flyway population estimates are imprecise and probably low; migration routes and non-breeding sites for the bulk of the flyway population are yet to be described. Difficulty in distinguishing birds of different populations in the field complicates description of subspecific population sizes, trends, and migration routes.

General Information

http://www.birdlife.org/datazone/speciesfactsheet.php?id=3056

Dunlin (unknown population) *Sites of international importance (C. alpina all EAAF populations combined: 1% = 5,539; 0.25% = 1,385), continued.*

Site	Country	Name	Max Count	Date	Ref.
129	China	Sheyang Saltworks, Jiangsu	12,049	28 Apr 01	*16*
117	China	Nantong Coast	11,230	2007	*127*
76	China	Changhua Coastal Industrial Park	11,068	01 Feb 02	*128*
72	China	Anqingyanjiang Nature Reserve: Caizi Hu	10,709	Feb 05	*42*
134	China	Szu-Tsao Wildlife Reserve	10,363	01 Dec 02	*128*
138	China	Tseng-Wen-Chi (River)	9,500	01 Nov 02	*128*
301	Russia	Odoptu Gulf	9,500	09 Sep 09	*197*
139	China	Wenzhou Wan	9,092	Jan 07	*42*
149	China	Yueqing Wan & Xuanmen Wan	8,877	Jan 07	*42*
172	Japan	Fujimae Higata	8,650	14 Apr 00	*114*
170	Japan	Daijugarami	8,200	07 Apr 01	*114*
136	China	Tianjin Coast	8,000	01 Dec 11	*46*
73	China	Anqingyanjiang Nature Reserve: Wuchang Hu	6,072	Feb 04	*42*
84	China	Deep Bay (incl. Mai Po & Futian)	5,845	09 Jan 95	*102*
		updated count	***5,030***	***20 Jan 13***	*102*
123	China	Quanzhou Wan	5,772	Feb 06	*42*
113	China	Meizhou Wan	5,684	Feb 06	*42*
305	Russia	Schastiya Bay	4,867	01 Sep 02	*4*
96	China	Tongzhou-Haimen Coast (Xinzhong Port)	4,760	Late Apr 05	*19*
119	China	Qidong County North Coast	4,591	Late Apr 05	*19*
187	Japan	Inner Tokyo Bay	4,064	29 Apr 03	*114*
306	Russia	Skobeleva Bay*	4,020	15 May 98	*85*
224	Japan	Shio-kawa Higata	4,000	28 Apr 02	*114*
165	Japan	Arao Kaigan	3,767	08 Apr 08	*114*
153	China	Zhuanghe West Coast	3,422	May 05	*19*
181	Japan	Hikawa Estuary, Shiranui	3,100	19 Apr 09	*114*
292	Russia	Kharchinskoe Lake*	2,650	24 May 99	*87*
100	China	Huanghua Coast (Cangzhou)	2,620	01 Mar 11	*46*
211	Japan	Nakatsu Kaigan (Higashi-hama)	2,098	24 Apr 11	*114*
202	Japan	Kuma-gawa Kako	2,091	24 Apr 05	*114*
94	China	Guandong Haifeng Wetlands	1,730	03 Mar 11	*46*

* These five sites are not included in the 'potential' sites for *C. a. actites* in Tables 4–6 of the *Summary by Country* section, because they lie outside the likely range of the population.

CURLEW SANDPIPER
CALIDRIS FERRUGINEA

EAAF population size: **135,000**
EAAF population trend: **Steep decline**
Global Red List status: **Least Concern**

14

Globally, the Curlew Sandpiper is considered a species of Least Concern, due to its wide distribution and very large and apparently increasing worldwide population[31]. However, the species is a candidate for upgrading to Near Threatened status based on steep declines in East Asia[133]. The population using the EAAF appears to be sufficiently declining to qualify for Endangered status at the regional level (criterion A2/3/4). However, lack of phenotypic differentiation from other flyways suggests exchange of individuals from other (non-declining) populations, and so a regional status of **Vulnerable** has been recommended[80].

Taxonomy

No subspecies described.

Population

Size: preliminary current population estimate of 135,000[210] derived by applying observed flyway declines[80] to previous population estimate of 180,000[8].

Trend: non-breeding surveys in Australia have indicated a population decline of 50–79% in three generations (23 years)[80]. Numbers migrating through Japan showed no clear trend over the same time period[1]; however, this is not a major migratory route for the species.

Distribution

Breeding: Arctic northeastern Siberia.

Non-breeding: approximately 75% in Australia, with smaller numbers in Southeast Asia and Indonesia. Males predominately occur in southern part of non-breeding range[153]. Young birds often stay in the non-breeding range year-round, and non-breeding adults remain just south of the breeding grounds.

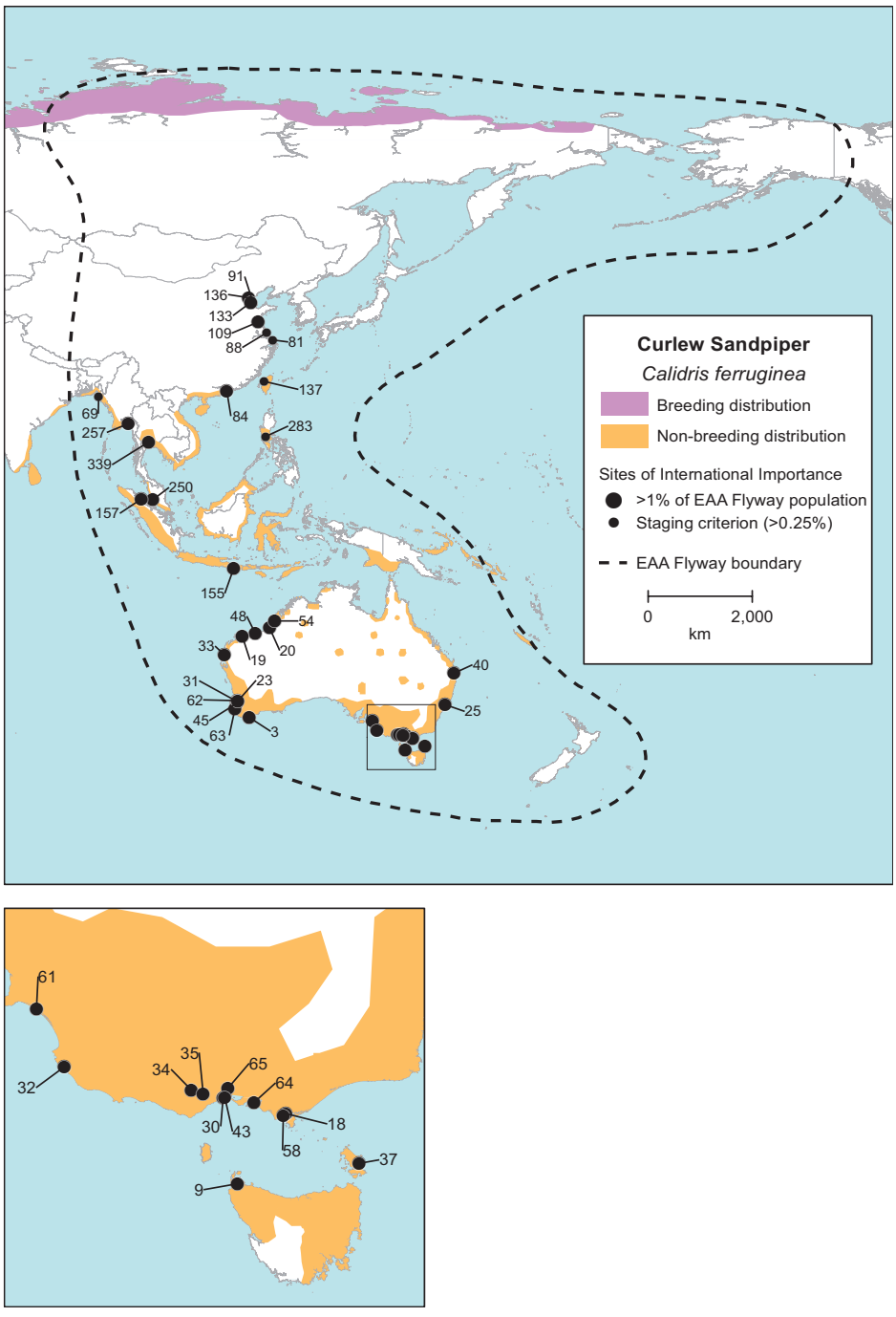
Migration: migration may follow a primarily inland route through China and Russia on both northward and particularly southward migration. On northward migration, more than 20% of the flyway population stages in Bohai Bay, China[225], but the population appears to take a more westerly route on southward migration, largely skipping the Yellow Sea region. Northbound birds departing non-breeding sites in Australia appear to overfly northern Australia on a non-stop flight to East Asia, but southbound birds may stop in northwestern Australia before dispersing to non-breeding sites around Australia. Adults migrate away from the breeding areas before juveniles[156].

Habitat

Breeding: breeds near margins of marshes and pools, on the (southward-facing) slopes of hummock tundra or dry patches in *Polygonum* tundra; in the lowlands of the high Arctic and along the coasts of the Arctic Ocean. Has a preference for open tundra with marshy, boggy depressions and pools. Mainly Arctic but may breed on southern tundra when spring is late[122].

Non-breeding and migration: coastal brackish lagoons, tidal flats, saltpans, estuaries, salt marshes, exposed coral, rocky shores, and sandy beaches. Also inland along muddy edges of marshes, rivers, and lakes. May use irrigated land and flooded areas.

Curlew Sandpiper
Range and sites of international importance. Site details on next page.



Major Threats

Demographic modelling has indicated reduced adult survival is main driver of population decline[178]. Threatened by wetland degradation of non-breeding and migratory sites in Australia and East Asia, particularly in Bohai Bay, China. Threats to inland sites used on migration may include commercial harvesting of brine shrimp *Artemia* sp. and loss of ephemeral wetlands due to climate change and water abstraction.

Knowledge Gaps

Trends in non-breeding population outside Australia are unknown. Ecology and site use during inland portion of migration are largely undescribed. Degree of

Curlew Sandpiper *Sites of international importance (1% = 1,350; 0.25% = 338).*

Site	Country	Name	Max Count	Date	Ref.
91	China	Luannan Coast & Saltworks	80,000	01 May 10	*98*
20	Australia	Eighty Mile Beach	60,000	<1988	*121*
		updated count	***7,984***	***01 Nov 01***	*143*
33	Australia	Lake MacLeod	55,000	01 Oct 06	*81*
48	Australia	Port Hedland Saltworks	25,000	19 Nov 82	*121*
		updated count	***818***	***01 Sep 02***	*6*
61	Australia	The Coorong & Coorong National Park	13,430	01 Feb 03	*91*
65	Australia	Western Port Phillip Bay	13,323	<2004	*6*
136	China	Tianjin Coast	12,489	12 Apr 00	*17*
84	China	Deep Bay (incl. Mai Po & Futian)	10,982	17 Apr 07	*102*
257	Myanmar	Inner Gulf of Martaban	6,762	Winter 2009	*232*
64	Australia	Western Port	6,343	02 Oct 90	*6*
54	Australia	Roebuck Bay	6,000	13 Feb 83	*6*
		updated count	***1,887***	***01 Nov 05***	*6*
40	Australia	Moreton Bay	5,229	01 Jan 96	*6*
25	Australia	Hunter Estuary	4,000	<2001	*188*
250	Malaysia	North-central Selangor Coast	4,000	10 Feb 90	*214*
		updated count	***1,000***	***20 Mar 11***	*33*
32	Australia	Lake George	3,528	02 Dec 83	*6*
18	Australia	Corner Inlet	3,500	02 Jan 87	*6*
9	Australia	Boullanger Bay/Robbins Passage	3,400	01 Jan 95	*6*
30	Australia	Lake Connewarre Area	3,184	2007	*127*
19	Australia	Dampier Saltworks	3,000	01 Sep 98	*10*
34	Australia	Lake Martin	3,000	14 Feb 01	*220*
45	Australia	Peel-Harvey System	3,000	2006	*187*
109	China	Lianyungang Coast	3,000	12 May 13	*46*
339	Thailand	Inner Gulf of Thailand	2,800	28 Sep 00	*28*
58	Australia	Shallow Inlet/Sandy Point	2,690	02 Aug 86	*6*
31	Australia	Lake Cooloongup	2,600	<1990	*112*
133	China	Wudi-Zhanhua-Hekou Coast, Shandong	2,512	02 May 02	*17*
62	Australia	Thomsons Lake Nature Reserve	2,500	01 Jan 93	*6*
63	Australia	Vasse Wonnerup Estuary	2,500	<1990	*112*
155	Indonesia	Benoa Bay	2,500	11 Jan 90	*214*
37	Australia	Logan Lagoon, Flinders Island	2,470	01 Mar 84	*157*

Table continues

dependence on coastal sites in the Yellow Sea region, particularly Bohai Bay, is poorly understood. Given the apparent importance of saltpan foraging habitats during migration, it is critical to learn whether different types of salt production (e.g., commercial vs. industrial) along the Chinese coast are similar in terms of supporting critical brine fly and brine shrimp prey resources.

General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3057

Curlew Sandpiper *Sites of international importance (1% = 1,350; 0.25% = 338), continued.*

Site	Country	Name	Max Count	Date	Ref.
35	Australia	Lake Murdeduke	2,100	02 Dec 83	*6*
3	Australia	Albany Harbours	2,054	01 Jan 96	*6*
23	Australia	Forrestdale Lake Nature Reserve	2,000	01 Jan 93	*6*
43	Australia	Ocean Grove to Barwon Heads	2,000	17 Feb 85	*6*
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	2,000	23–30 Dec 95	*59*
283	Philippines	Manila Bay	1,278	04 Apr 87	*151*
81	China	Chongming Dongtan National Nature Reserve	805	26 Mar 01	*132*
88	China	Dongtai (Zhou Gang – Qiang Gang Coast)	700	28 Apr 01	*16*
137	China	Ta-Tu-His, Changhua	500	01 May 87	*151*
69	Bangladesh	Sonadia & Moheskhali Island	400	13–19 Mar 12	*51*

© John & Jemi Holmes. *Mai Po in Deep Bay, Hong Kong (Site #84)*

For 11 of 12 priority populations that do not represent flyway-endemic species, both the global and EAAF populations of the species are known or suspected to be declining. **Curlew Sandpiper** is the exception; despite a precipitous decline in the flyway, the large global population is thought to be increasing.

SPOON-BILLED SANDPIPER
EURYNORHYNCHUS PYGMEUS

EAAF population size: **140–480** 15
EAAF population trend: **Steep decline**
Global Red List status: **Critically Endangered**

The Spoon-billed Sandpiper is among the most endangered waterbirds in the world, and holds an unquestioned position as a top conservation priority in the EAAF, where it is endemic. Previously considered Vulnerable based on its restricted breeding range and small population, recently recognized population declines were sufficient to warrant upgrading to Endangered status in 2004 and again to **Critically Endangered** in 2008[231]. It is also listed on Appendix I of the Convention on Migratory Species[55]. The Spoon-billed Sandpiper is currently the subject of immense conservation effort, including a captive-rearing programme[31], and serves as a flagship and model for protection of migratory shorebirds in the flyway and the world.

Taxonomy

Monotypic species endemic to EAAF.

Population

Size: current estimate recently revised to 140–480 based on a combination of surveys and expert opinion[215].

Trend: apparent decline of more than 80% in the last 40 years[231], from an estimated 2,000–2,800 breeding pairs to probably less than 200 today.

Distribution

Breeding: coastal far eastern Russia, from Chukotka to northern Kamchatka.

Non-breeding: primarily Bangladesh, Thailand, and Myanmar, but also recorded throughout Southeast Asia, in southeast China, and west to southeast India and Sri Lanka. Site fidelity unknown. At least some immature birds remain on non-breeding grounds during the breeding season[75].

Migration: migration in both directions follows the East Asian coast, with important concentrations recorded in Kamchatka, Sakhalin Island, South Korea, and coastal China. However, stopover sites apparently differ between the migrations; e.g., northbound birds appear more frequently in Hong Kong[43], and southbound birds more frequently in Japan[38]. On both northward and southward migration, the great majority of the population appears to stage at Rudong in Jiangsu, China, where adults also undergo primary moult in autumn.

Habitat

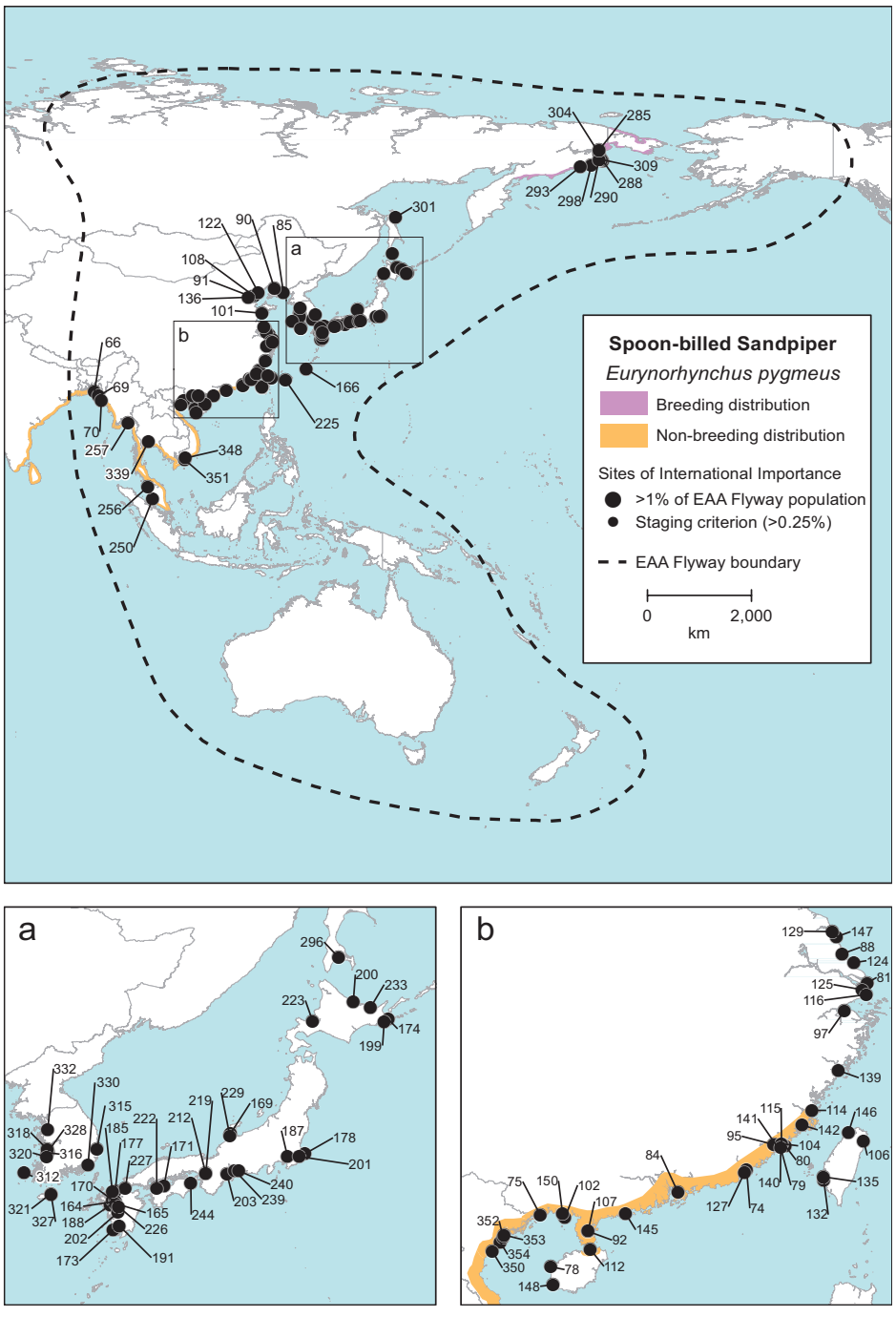
Breeding: shallow-sloped shorelines[122], but may breed up to 5–7 km from the coast; specialized use of graveled or sandy lagoon spits with crow-berry lichen vegetation or dwarf birch and willow sedges. Requires adjacent estuary, mudflats, or freshwater pools as feeding sites for nesting adults.

Non-breeding and migration: tidal flats, coastal lagoons, outermost parts of river deltas, and outer islands of estuaries. Often uses relatively sandy flats covered with a thin mud layer. Also occurs in saltpans and drained fish and shrimp ponds.

Major Threats

Threatened by degradation and destruction of coastal migratory and non-breeding sites through reclamation, development, pollution, disturbance, and reduced river flows. The main staging and moulting area (Rudong, China) is

Spoon-billed Sandpiper
Range and sites of international importance. Site details on next page.



threatened by encroachment by *Spartina alterniflora*, port and intertidal wind farm development, industrial pollution, and the proposed reclamation of the offshore Dongsha shoals, which could result in major changes to hydrodynamics and sediment distribution along the mainland coast. Hunting is a significant threat to non-breeding birds, particularly in Bangladesh and Myanmar, and also in China. Threats in the breeding season include nest predation, human disturbance (including research activities), and scientific collecting. Poor breeding productivity and recruitment have been implicated as major factors in the population decline.

Spoon-billed Sandpiper *Sites of international importance (1% and 0.25% = 1).*

Site	Country	Name	Max Count	Date	Ref.
147	China	Yancheng Nature Reserve	221	01 Jan 91	*191*
		updated count	***8***	***2012***	*30*
66	Bangladesh	Ganges-Brahmaputra-Meghna Delta	202	30 Jan 89	*214*
		updated count	***23***	***28 Mar 10***	*29*
296	Russia	Lososei Bay	200	30 May 79	*154*
257	Myanmar	Inner Gulf of Martaban	199	Winter 2010	*232*
328	South Korea	Mangyung River Estuary	180	06 Sep 99	*161*
		updated count	***5***	***2011***	*30*
124	China	Rudong Mudflats	143	01 Jan 13	*46*
316	South Korea	Dongjin River Estuary	100	02 Oct 00	*15*
81	China	Chongming Dongtan National Nature Reserve	54	Undated	*216*
		updated count	***2***	***2010***	*30*
188	Japan	Isahaya Higata	41	<2000	*203*
298	Russia	Meinypil'gyno	28	2008	*30*
69	Bangladesh	Sonadia & Moheskhali Island	27	2011	*50*
354	Vietnam	Xuan Thuy Ramsar Site	27	07 Mar 97	*32*
318	South Korea	Geum River Estuary (incl. Yubu Island)	20	2006	*138*
88	China	Dongtai (Zhou Gang – Qiang Gang Coast)	17	2012	*30*
339	Thailand	Inner Gulf of Thailand	16	25 Jan 04	*27*
		updated count	***15***	***2008***	*30*
114	China	Minjiang Estuary	14	01 Feb 11	*46*
129	China	Sheyang Saltworks, Jiangsu	14	01 Nov 89	*191*
330	South Korea	Nakdong Estuary	14	2006	*73*
84	China	Deep Bay (incl. Mai Po & Futian)	13	04 Mar 05	*102*
304	Russia	Russian Koshka Spit	10	2011	*30*
70	Bangladesh	Teknaf Coast	8	2006	*127*
139	China	Wenzhou Wan	8	03 Mar 13	*191*
293	Russia	Khatyrka	8	2008	*30*
125	China	San Jia Gang (Pudong)	7	11 May 09	*191*
288	Russia	Beringovsky Vicinity	6	2008	*30*
309	Russia	Yugznaya Lagoon	6	2009	*30*
97	China	Hangzhou Wan	5	2013	*30*

Table continues

Knowledge Gaps

Although threats throughout the annual cycle are well-documented, it is unclear specifically which conservation actions will most effectively reverse the population decline. It is possible that some breeding and non-breeding sites have yet to be discovered. Dependence on specific sites during migration is poorly understood; in particular, reasons underlying the importance of the Rudong site warrant specific attention.

General Information

http://www.birdlife.org/datazone/speciesfactsheet.php?id=3060

http://www.birdlife.org/datazone/userfiles/file/Species/AsRDBPDFs/species/eurypygm.pdf

Spoon-billed Sandpiper *Sites of international importance (1% and 0.25% = 1), continued.*

Site	Country	Name	Max Count	Date	Ref.
187	Japan	Inner Tokyo Bay	5	27 Sep 03	*114*
		updated count	***1***	***26 Aug 07***	*114*
351	Vietnam	Tan Thanh/Go Cong	5	2011	*30*
85	China	Yalujiang National Nature Reserve, Liaoning	4	01 May 12	*46*
92	China	Fucheng, Zhangjiang	4	18 Dec 12	*136*
107	China	Leizhou, Zhangjiang	4	2012	*46*
177	Japan	Hakata-wan Tobu (Wajiro, Tatara)	4	31 Aug 07	*114*
290	Russia	Kainupilgin Lagoon	4	2008	*30*
320	South Korea	Gomso Bay	4	2010	*30*
352	Vietnam	Thai Thuy	4	2006	*127*
353	Vietnam	Tien Lang District	4	Jan 06	*158*
101	China	Jiazhou Wan	3	01 Jan 90	*191*
141	China	Xiamen Coast (incl. Aotou & Fenglin)	3	18 Mar 06	*191*
145	China	Xitou	3	11 Mar 12	*136*
74	China	Liuhewei	2	15 May 12	*191*
75	China	Guangxi Beilun Estuary National Nature Reserve	2	01 Jan 09	*191*
79	China	Chee Lake, Kinmen	2	2012	*30*
106	China	Lan-Yang-Hsi (Lanyang Estuary)	2	2009	*30*
108	China	Laoting (Daqinghe – Shijiutuo)	2	01 May 96	*191*
127	China	Shantou (Nangankou)	2	2010	*30*
170	Japan	Daijugarami	2	26 Sep 10	*114*
200	Japan	Komuke-ko	2	03 Sep 10	*114*
219	Japan	Osaka Hokko Minami-chiku	2	18 Sep 05	*114*
223	Japan	Shin-kawa Kako	2	19 Sep 00	*114*
227	Japan	Sone Higata (Sone-Higata Tideland)	2	01 Sep 02	*114*
233	Japan	Tofutsu-ko	2	31 Aug 10	*114*
244	Japan	Yoshino-gawa Karyu-iki	2	07 Sep 03	*114*
285	Russia	Anadyr Lowlands	2	2008	*30*
348	Vietnam	Can Gio	2	2011	*30*
78	China	Changhua River Estuary, Chuanghuazhen	1	28 Dec 11	*191*
80	China	Kinmen Island	1	25 Apr 11	*191*
90	China	Erdao Saltworks, Yinghekou	1	07 May 05	*191*
91	China	Luannan Coast & Saltworks	1	29 May 12	*97*
95	China	Haicang Coast, Xiamen	1	23 Nov 08	*191*
102	China	Jinwan Mangrove, Beihai	1	24 Mar 13	*191*
104	China	Jujiang Saltpan	1	2011	*30*
112	China	Meilisha Reclamation Pools, Haikou	1	18 Jan 09	*191*
115	China	Qianbancun	1	01 Apr 06	*191*
116	China	Nanhui Coast	1	17 Oct 11	*191*
122	China	Qinhuangdao	1	2009	*30*
132	China	Sihcao Wetlands	1	2011	*30*
135	China	Chiku, Tainan	1	2012	*30*

Table continues

© Michelle & Peter Wong. *Mai Po in Deep Bay, Hong Kong (Site #84)*

Six of 20 EAAF priority populations currently have Near Threatened or higher status on the Global IUCN Red List; the Critically Endangered **Spoon-billed Sandpiper** is certainly the most vulnerable and famous of these. According to data from the EAAF, an additional 14 populations warrant upgrading from Least Concern to Near Threatened or higher status at the regional level.

Spoon-billed Sandpiper *Sites of international importance (1% and 0.25% = 1), continued.*

Site	Country	Name	Max Count	Date	Ref.
136	China	Tianjin Coast	1	07 Sep 04	*191*
140	China	Wujiang River Wetland, Kinmen	1	2011	*30*
142	China	Xinghua Wan	1	09 Apr 06	*191*
146	China	Xucuogang Wetland	1	2009	*30*
148	China	Yinggehai Saltpan	1	29 Dec 11	*191*
150	China	Yujiang Village, Xiangli Town	1	22 Mar 13	*191*
164	Japan	Anogawa & Shitomogawa Estuaries, Toyotsuura	1	27 Aug 04	*114*
165	Japan	Arao Kaigan	1	09 Sep 01	*114*
166	Japan	Awase Higata	1	22 Apr 07	*114*
169	Japan	Chiri-hama	1	04 Sep 04	*114*
171	Japan	Daimyoujin-gawa Kakou	1	15 Sep 09	*114*
173	Japan	Fukiagehama Kaigan	1	20 Sep 10	*114*
174	Japan	Furen-ko	1	06 Sep 00	*114*
178	Japan	Hasaki Shinko	1	20 Sep 04	*114*
185	Japan	Imazu Higata	1	22 Apr 08	*114*

Table continues

Spoon-billed Sandpiper *Sites of international importance (1% and 0.25% = 1), continued.*

Site	Country	Name	Max Count	Date	Ref.
191	Japan	Kagoshima-ken Beppu-gawa	1	22 Dec 11	*114*
199	Japan	Kiritappu Shitsugen	1	14 Sep 00	*114*
201	Japan	Kujukuri Coast	1	20 Sep 10	*114*
202	Japan	Kuma-gawa Kako	1	23 Apr 06	*114*
203	Japan	Kumozugawa, Atagogawa & Kongogawa Estuaries	1	14 Sep 08	*114*
212	Japan	Nanko Yachoen	1	09 Sep 06	*114*
222	Japan	Shigenobu-gawa Kako	1	20 Sep 10	*114*
225	Japan	Shiraho, Miyara-wan	1	22 Apr 07	*114*
226	Japan	Shira-kawa Kako	1	03 May 06	*114*
229	Japan	Takamatsu, Kahoku Kaigan	1	20 Sep 10	*114*
239	Japan	Yahagi-gawa Kako Shuhen	1	11 Sep 05	*114*
240	Japan	Yahagihuru-kawa Kako	1	25 Sep 04	*114*
250	Malaysia	North-central Selangor Coast	1	24 Mar 12	*33*
256	Malaysia	Teluk Air Tawar-Kuala Muda Coast	1	25 Feb 13	*33*
301	Russia	Odoptu Gulf	1	19–27 Aug 09	*197*
312	South Korea	Baenang-gimi Wetland	1	2012	*30*
315	South Korea	Dogu Beach	1	2012	*30*
321	South Korea	Hado-ri	1	2012	*30*
327	South Korea	Jondal-ri	1	2010	*30*
332	South Korea	Namyang Bay	1	2012	*191*
350	Vietnam	Nghia Hung	1	2012	*30*

EURASIAN OYSTERCATCHER
HAEMATOPUS OSTRALEGUS OSCULANS

EAAF population size: **11,000**

EAAF population trend: **Suspected decline**

Global Red List status: **Least Concern**

16

Despite an apparently declining global population, the Eurasian Oystercatcher is considered a species of Least Concern due to its very large range and population size[31]. However, the EAAF population (*H. o. osculans*), endemic to the flyway and considered by some to represent a separate species, warrants separate consideration based on its disjunct breeding range and specific threats. Although trend information is lacking, an observed long-term contraction in the breeding range and a significant reliance on the Yellow Sea during breeding, migration, and non-breeding seasons are causes for concern[139]. Its small population size (<10,000 mature individuals) and suspected or potential population decline qualify *H. o. osculans* for **Near Threatened** status at the regional Red List level (criterion C1).

Taxonomy

Three subspecies recognized: *H. o. ostralegus* breeds in Europe and northwestern Russia; *H. o. longipes* breeds in west-central Russia; and *H. o. osculans*, breeding on the Kamchatka peninsula and the mainland of far eastern Asia from the Amur River to the Yellow Sea. The latter population was originally described as the full species Far Eastern Oystercatcher *H. osculans*[194], and some modern sources consider it a full species[129].

Population

Size: the previous flyway population estimate of 5,000–10,000[215] has been increased to 11,000 individuals based on non-breeding counts in South Korea and China in January 2103[139].

Trend: insufficient data exist to describe population trend in the EAAF. Although considered to be declining in South Korea[150], large fluctuations in observed non-breeding numbers may be the result of redistribution rather than actual population trajectory[139]. However, declining numbers at certain breeding areas and a high reliance on intertidal habitats in the Yellow Sea, particularly in the non-breeding season, suggest a likely current or potential decline.

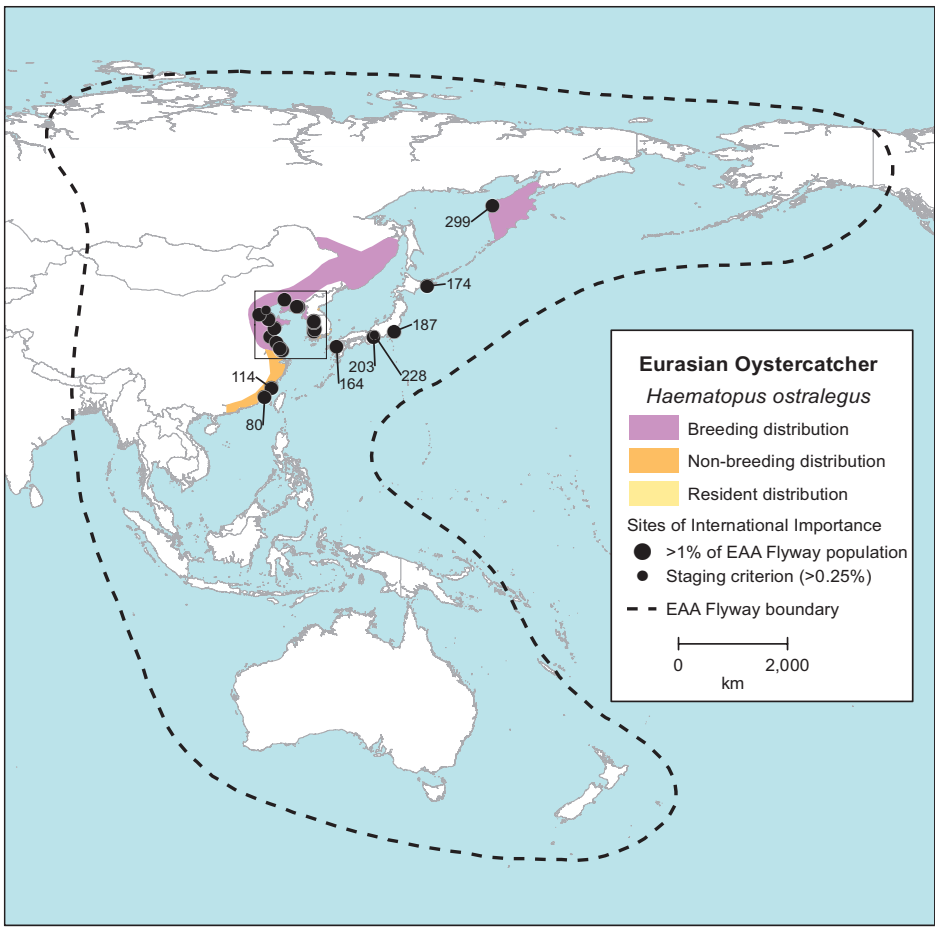
Distribution

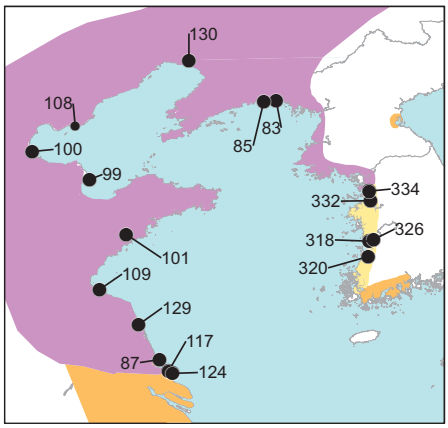
Breeding: limits of breeding range poorly defined. Two disjunct breeding regions currently recognized: one along the west coast of Kamchatka, and one stretching from the Amur River mouth south to costal Fujiian Province, China, and including the Yellow Sea coast of the Korean peninsula. Formerly bred in Chukotka and eastern Kamchatka.

Non-breeding: approximately 70% of the population along the west coast of South Korea, including 50% at a single site, Yubu Island in the Geum Estuary. Significant numbers in coastal mainland China, and smaller numbers in Japan, Taiwan, and the south and east coasts of the Korean Peninsula.

Migration: may be capable of direct flights between the Yellow Sea and Kamchatka; significant numbers occur on Sakhalin Island during southward migration but only rarely on northward migration[139]. Passage of large numbers through the northern Yellow Sea, Korean Peninsula, and Kamchatka is conspicuous on both migrations[139]. As the breeding and non-breeding ranges overlap in South Korea and China, some individuals may be essentially non-migratory.

Eurasian Oystercatcher
Range and sites of international importance. Site details on next page.





Habitat

Breeding: typically sand or gravel beaches or other dry, sandy areas with little or no vegetation. Also in rocky habitats, occasionally saltmarsh vegetation, and potentially cultivated land.

Non-breeding and migration: generally similar to breeding, but with greater use of tidal flats and rocky shorelines.

Major Threats

Loss and degradation of intertidal winter, staging, and breeding-season foraging areas, particularly in Yellow Sea, through reclamation, pollution, disturbance, and

© Neil Fifer. *Mai Po in Deep Bay, Hong Kong (Site #84)*

For at least 13 of 20 priority shorebird populations in the EAAF, the Yellow Sea (including Bohai Bay) supports 20–100% of the flyway population during migratory periods. Of these, only the **Eurasian Oystercatcher** also uses the Yellow Sea for breeding; some individuals may remain in the region year-round.

	reduced river flows. Vulnerability is increased by concentration of half of the non-breeding population at a single site, which is currently further threatened by wind farm development. Encroachment by *Spartina alterniflora* causes loss of both intertidal foraging and upper beach nesting habitat.
Knowledge Gaps	Currently population trend and vital rates are unknown. Limits of breeding range are poorly defined; in particular, extent of use of inland China breeding areas is poorly described. Range of migratory strategies is unknown; no ringing recoveries or tracking have yet connected individual breeding and non-breeding areas. The EAAF population's status as a subspecies or full species requires investigation.
General Information	http://www.birdlife.org/datazone/speciesfactsheet.php?id=3088

Eurasian Oystercatcher *Sites of international importance (1% = 110; 0.25% = 28).*

Site	Country	Name	Max Count	Date	Ref.
318	South Korea	Geum River Estuary (incl. Yubu Island)	5,700	26 Jan 01	*15*
		updated count	***3,600***	***06 Nov 10***	*60*
320	South Korea	Gomso Bay	2,980	Jan 13	*189*
109	China	Lianyungang Coast	2,600	17 Feb 13	*46*
326	South Korea	Janghang Reservoir (Estuary)	2,463	2003	*46*
83	China	Dandong Port East	2,458	17 May 13	*46*
130	China	Shuangtaizihekou National Nature Reserve	1,450	25 Aug 12	*46*
299	Russia	Moroshechnaya River Estuary	600	Early 2012	*67*
117	China	Nantong Coast	420	2007	*127*
85	China	Yalujiang National Nature Reserve, Liaoning	296	13–23 Apr 06	*170*
101	China	Jiazhou Wan	294	29 Dec 03	*139*
187	Japan	Inner Tokyo Bay	278	06 Feb 12	*114*
124	China	Rudong Mudflats	235	15 Aug 13	*46*
332	South Korea	Namyang Bay	220	01 Sep 98	*229*
129	China	Sheyang Saltworks, Jiangsu	179	14 Jan 04	*47*
114	China	Minjiang Estuary	150	07–08 Aug 04	*48*
99	China	Huang He Delta Nature Reserve	130	14 Apr 92	*209*
87	China	Dongsha Shoals	120	01 Sep 97	*205*
100	China	Huanghua Coast (Cangzhou)	111	Nov 11	*46*
334	South Korea	Songdo Tidal Flat	108	2006–2010	*34*
80	China	Kinmen Island	80	27–29 Jan 13	*139*
203	Japan	Kumozugawa, Atagogawa & Kongogawa Estuaries	77	27 Feb 13	*114*
164	Japan	Anogawa & Shitomogawa Estuaries, Toyotsuura	68	23 Jan 11	*114*
174	Japan	Furen-ko	61	30 Apr 12	*114*
108	China	Laoting (Daqinghe – Shijiutuo)	25	14 May 01	*139*
228	Japan	Suzuka-gawa Kako, Suzuka-hasen Kako	20	16 Sep 08	*114*

GREY PLOVER
PLUVIALIS SQUATAROLA SQUATAROLA

EAAF population size: **104,000**

EAAF population trend: **Strong decline**

Global Red List status: **Least Concern**

17

Despite an apparently declining population worldwide, the Grey Plover is considered a species of Least Concern, due to its global distribution and large population[31]. However, the species is a candidate for upgrading to Near Threatened status based on rapid declines in the EAAF[133]. The flyway population appears to be sufficiently declining to qualify for Vulnerable status at the regional level (criterion A2/3/4). However, lack of phenotypic differentiation from other flyways suggests exchange of individuals from other (possibly non-declining) populations, and so a downgraded regional status of **Near Threatened** has been recommended[80].

Taxonomy

Taxonomy is debated. Many sources recognize no subspecies. Others recognize up to three subspecies: *P. s. cynosurae*, breeding in northern Canada; *P. s. squatarola*, breeding in Eurasia and Alaska; and *P. s. tomkovichi*, restricted to Wrangel Island. A portion of *P. s. squatarola* uses the EAAF, but also the East Atlantic, East African, Central Asian, and American Pacific Flyways. The non-breeding range of *P. s. tomkovichi* is unknown, but may represent an additional endemic population in the EAAF; there is a single record in China of a bird flagged on Wrangel Island[201].

Population

Size: preliminary current flyway population estimate of 104,000[210] derived by applying observed flyway declines[80] to previous population estimate of 125,000[8].

Trend: non-breeding surveys in Australia (where only about 10% of the population winters) have indicated a population decline of 30–49% in three generations (22 years)[80]. This is consistent with a decline in numbers migrating through Japan during the same time period[1], and so is thought to reflect a general trend in the flyway population.

Distribution

Breeding: Siberian Arctic east to western and northern Alaska.

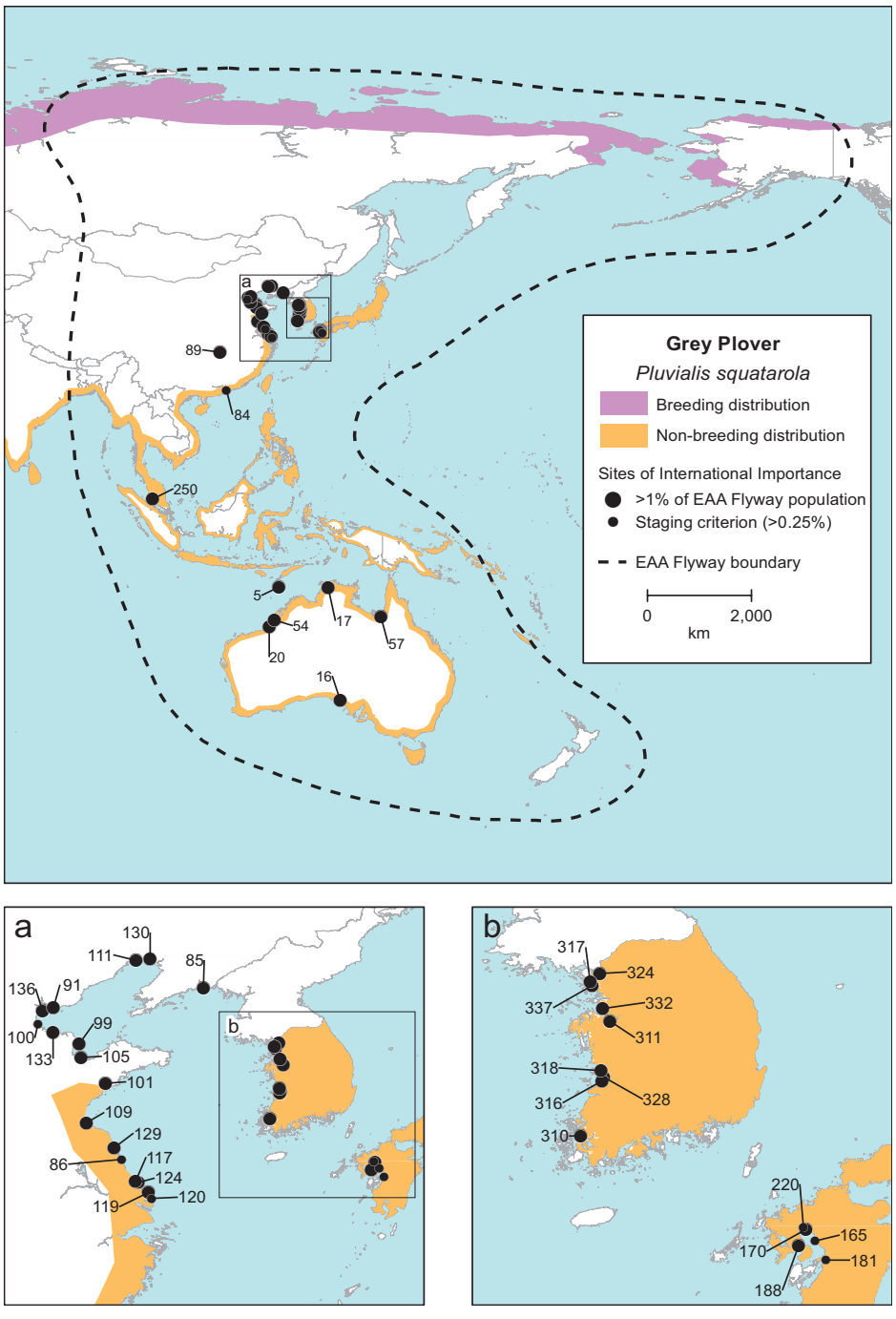
Non-breeding: Southeast Asia to Australia. The lack of important sites identified during the non-breeding season implies that either the population is widely dispersed or significant parts of the non-breeding range are unknown. Juveniles and non-breeders often remain in the non-breeding range or migrate part way north.

Migration: may make non-stop flights between Australian non-breeding grounds and staging areas in the Yellow Sea; this is supported by a lack of important migratory sites and sightings of marked birds between eastern China and Australia[141]. Approximately 80% of the flyway population passes through the Yellow Sea on northward migration; much lower numbers on southward migration suggest that the bulk of the population migrates southward directly from the Russian Far East, bypassing the Yellow Sea.

Habitat

Breeding: dry, stony tundra with sedge, moss, lichen, grass, or dwarf birch; also peat ridges in tundra marshes, dry exposed ridges, riverbanks, raised sand and gravel beaches, and rocky slopes. In the high Arctic, uses upland slopes and valleys.

Grey Plover
Range and sites of international importance. Site details on next page.



Also breeding populations in subalpine and boggy areas in the boreal zone; in Chukotka, mostly in coastal zone, with sporadic breeding in inland mountains up to 500 m[122].

Non-breeding and migration: tidal flats, salt marshes, sandflats, ocean beaches, bays, and estuaries. May use inland lakes, pools, saltpans, or grasslands during migration.

Grey Plover *Sites of international importance (1% = 1,040; 0.25% = 260).*

Site	Country	Name	Max Count	Date	Ref.
99	China	Huang He Delta Nature Reserve	14,899	21 Apr 97	*230*
		updated count	***2,300***	***01 Sep 10***	*46*
109	China	Lianyungang Coast	8,870	17 Feb 13	*46*
85	China	Yalujiang National Nature Reserve, Liaoning	7,232	20 May 00	*14*
136	China	Tianjin Coast	6,493	12 Apr 00	*17*
		updated count	***3,000***	***01 May 11***	*46*
105	China	Laizhou Wan	5,801	10 May 04	*18*
328	South Korea	Mangyung River Estuary	4,700	01 Oct 99	*15*
124	China	Rudong Mudflats	4,305	Late Apr 05	*19*
130	China	Shuangtaizihekou National Nature Reserve	4,248	20 Apr 99	*20*
		updated count	***2,000***	***13 Aug 11***	*46*
316	South Korea	Dongjin River Estuary	3,601	01 May 98	*229*
133	China	Wudi-Zhanhua-Hekou Coast, Shandong	3,550	02 May 02	*17*
129	China	Sheyang Saltworks, Jiangsu	3,481	28 Apr 01	*16*
89	China	East Dongting Lake Nature Reserve	3,233	2003	*127*
318	South Korea	Geum River Estuary (incl. Yubu Island)	3,004	Mid-May 06	*175*
91	China	Luannan Coast & Saltworks	2,972	02 May 02	*17*
111	China	Linghekou, Jin, Liaoning	2,739	29 Apr 99	*13*
311	South Korea	Asan Bay	2,400	01 May 98	*229*
337	South Korea	Yeongjong Island	2,280	01 May 98	*229*
332	South Korea	Namyang Bay	2,265	01 May 98	*15*
324	South Korea	Han River Estuary	2,100	01 May 00	*184*
117	China	Nantong Coast	1,698	2007	*127*
119	China	Qidong County North Coast	1,694	Late Apr 05	*19*
17	Australia	Chambers Bay	1,650	25 Aug 92	*45*
20	Australia	Eighty Mile Beach	1,585	01 Nov 01	*143*
5	Australia	Ashmore Reef	1,511	01 Feb 05	*193*
16	Australia	Ceduna Bays	1,440	01 Feb 00	*219*
170	Japan	Daijugarami	1,400	01 May 02	*222*
54	Australia	Roebuck Bay	1,300	<1988	*121*
		updated count	***935***	***01 Nov 06***	*6*

Table continues

Major Threats Loss and degradation of intertidal winter and staging areas, particularly in Yellow Sea, through reclamation, pollution, disturbance, and reduced river flows.

Knowledge Gaps Reasons for population decline unknown. Due to wide dispersion, distribution of the population during the non-breeding season is poorly documented. Dependence on specific staging sites during migration is poorly understood. Potential segregation of the sexes in the non-breeding season warrants examination.

General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3114

Grey Plover *Sites of international importance (1% = 1,040; 0.25% = 260), continued.*

Site	Country	Name	Max Count	Date	Ref.
57	Australia	SE Gulf of Carpentaria	1,279	01 Mar 99	*71*
310	South Korea	Aphae Island	1,184	01 May 98	*146*
250	Malaysia	North-central Selangor Coast	1,147	Mar–Apr 92	*185*
		updated count	***490***	***17 Oct 05***	*33*
317	South Korea	Ganghwa Tidal Flat	1,145	01 May 98	*229*
188	Japan	Isahaya Higata	1,130	11 Sep 96	*77*
101	China	Jiazhou Wan	1,070	Feb 07	*42*
100	China	Huanghua Coast (Cangzhou)	960	01 Jan 10	*46*
86	China	Dongtai (Dau Long Gang – Zhou Gang)	947	28 Apr 01	*16*
84	China	Deep Bay (incl. Mai Po & Futian)	833	19 Jan 14	*102*
120	China	Qidong County South Coast	823	Late Apr 05	*19*
165	Japan	Arao Kaigan	804	29 Apr 98	*222*
220	Japan	Rokkaku-gawa Kako (Ashikari-cho)	374	10 Sep 10	*114*
181	Japan	Hikawa Estuary, Shiranui	273	18 Apr 10	*114*

LESSER SAND PLOVER
CHARADRIUS MONGOLUS MONGOLUS

EAAF population size: **25,500**

EAAF population trend: **Steep decline**

Global Red List status: **Least Concern**

18

Currently, the Lesser Sand Plover is considered a species of Least Concern, because its worldwide population trend is unknown[31]. However, the species is a candidate for upgrading to Near Threatened or Vulnerable based on recent rapid declines in East Asia[133]. Two of four populations in the EAAF (*C. m. mongolus* and *stegmanni*) may qualify for **Endangered** status at the regional level (criterion A2/3/4), due to substantial documented declines in the flyway, and recognition that further proposed degradation of intertidal staging habitats will perpetuate this decline[80]. Trends in the remaining EAAF populations are unknown.

Taxonomy

Five subspecies recognized, four of which occur in the EAAF. *C. m. atrifons* breeds in the Himalayas and winters from India to Southeast Asia and western Indonesia. *C. m. schaeferi* breeds in western and central China and winters in Southeast Asia and western Indonesia. *C. m. mongolus* breeds in northeastern Siberia and winters in southern China, Philippines, Indonesia, Papua New Guinea, and Australia. *C. m. stegmanni* breeds in far eastern Siberia and Kamchatka and winters in China, Japan, Philippines, eastern Indonesia, Melanesia, and Australia.

Population

Size: preliminary current population estimate for *C. m. mongolus* of 25,500[210] derived by applying observed flyway declines[80] to previous population estimate of 40,000[8]. If derived population declines in *C. m. mongolus* and *stegmanni* are subtracted from the previous total EAAF estimate for the species (130,000[8]), the current flyway population for the species would be no more than 108,000.

Trend: non-breeding surveys in Australia have indicated a population decline of at least 50–79% (combined numbers of subspecies *C. m. mongolus* and *stegmanni*) in three generations (16 years)[80]. Numbers passing through Japan on southward migration (presumably also combined numbers of the two subspecies) have declined similarly (by 61% during 1978–2008)[1].

Distribution

Breeding: northeastern Siberia, along western edge of Sea of Okhotsk.

Non-breeding: southern China, Philippines, Indonesia, Papua New Guinea, and Australia, with small numbers in Japan. Non-breeders often remain in the non-breeding range year-round.

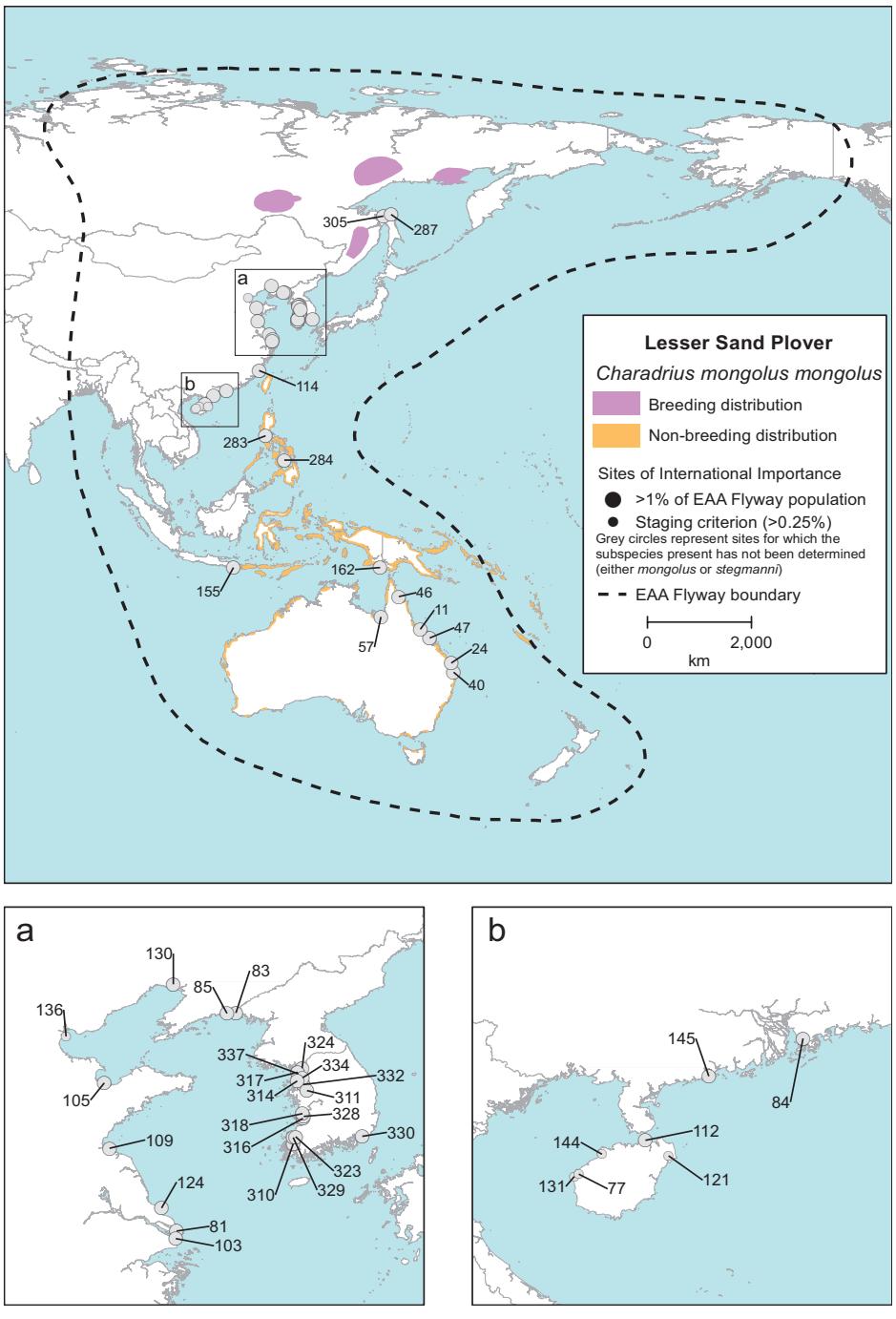
Migration: migration patterns of *C. m. mongolus* and *stegmanni* cannot be easily distinguished. Northward and southward migrations appear to follow similar routes through eastern Russia, the Yellow Sea, Japan, Philippines, and overland through China. Birds spending the non-breeding season in Australia may overfly much of Southeast Asia and Indonesia on both migrations.

Habitat

Breeding: well drained gravelly, rocky, or sandy surfaces with sparse vegetation, near water (bogs). In barren valleys and basins of elevated tundra and mountainous steppe, above tree line up to 5,500 m altitude. Also on dry edges of saltpans, grazing grounds, and saltmarshes.

Lesser Sand Plover (*C. m. mongolus*)

No important non-breeding or staging sites have been identified specifically for this population. Important sites and non-breeding range are shown for C. m. mongolus and stegmanni. Site details on next page.



Non-breeding and migration: mostly coastal in non-breeding, preferring sandy beaches, tidal flats, sandflats and dunes, coastal bays, and estuaries; occasionally uses mangrove mudflats. However, this subspecies migrates largely through inland habitats. May use coastal airfields or inland lakes.

Major Threats

Loss and degradation of intertidal winter and staging areas, particularly in East Asia, through reclamation, pollution, disturbance, and reduced river flows. Unknown threats in the breeding season.

Lesser Sand Plover (unknown population – *C. m. mongolus* and *stegmanni*) *Sites of international importance (C. m. mongolus and stegmanni combined: 1% = 385; 0.25% = 96).*

Site	Country	Name	Max Count	Date	Ref.
316	South Korea	Dongjin River Estuary	4,320	01 Sep 97	*229*
328	South Korea	Mangyung River Estuary	4,100	01 Sep 97	*229*
155	Indonesia	Benoa Bay	4,000	15 Jan 96	*214*
124	China	Rudong Mudflats	3,820	01 Aug 08	*46*
324	South Korea	Han River Estuary	3,500	01 May 00	*184*
162	Indonesia	Wasur National Park	3,130	<1990	*184*
46	Australia	Pelican Island (incl. nearby islands)	2,150	25 Nov 87	*56*
57	Australia	SE Gulf of Carpentaria	2,146	01 Mar 99	*71*
337	South Korea	Yeongjong Island	2,060	01 Sep 97	*229*
283	Philippines	Manila Bay	2,000	18 Jan 90	*214*
83	China	Dandong Port East	1,950	11 Sep 11	*46*
85	China	Yalujiang National Nature Reserve, Liaoning	1,950	01 Sep 11	*46*
284	Philippines	Olango Island	1,940	Oct 89	*135*
81	China	Chongming Dongtan National Nature Reserve	1,790	02 May 90	*195*
40	Australia	Moreton Bay	1,770	<1988	*121*
317	South Korea	Ganghwa Tidal Flat	1,700	01 Sep 97	*229*
318	South Korea	Geum River Estuary (incl. Yubu Island)	1,691	Mid-May 06	*175*
332	South Korea	Namyang Bay	1,610	01 Sep 97	*229*
47	Australia	Pioneer River – McEwan's Beach	1,575	01 Jan 93	*6*
11	Australia	Burdekin River Delta	1,540	18 Nov 95	*6*
24	Australia	Great Sandy Strait	1,430	<1988	*121*
310	South Korea	Aphae Island	1,144	01 May 98	*146*
103	China	Jiu Duan Sha National Nature Reserve	1,044	01 Jun 06	*46*
334	South Korea	Songdo Tidal Flat	1,000	2006–2010	*34*
305	Russia	Schastiya Bay	906	01 Sep 02	*4*
105	China	Laizhou Wan	877	10 May 04	*18*
329	South Korea	Muan-gun Tidal Flat	862	29 Aug 98	*146*
109	China	Lianyungang Coast	835	01 Sep 12	*46*
130	China	Shuangtaizihekou National Nature Reserve	682	12 May 98	*20*
		updated count	***400***	***01 Aug 11***	*46*
145	China	Xitou	658	22 Mar 12	*136*
112	China	Meilisha Reclamation Pools, Haikou	552	18 Jan 09	*125*
287	Russia	Baikal Bay	500	11 Aug 79	*154*

Table continues

Knowledge Gaps Difficulty in distinguishing the subspecies during counts complicates determining population-specific estimates, trends, migration routes, and non-breeding ranges. No current estimates for subspecies breeding in western China and Himalayas. Unknown dependence on specific sites during migration.

General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3138

Lesser Sand Plover (unknown population – *C. m. mongolus* and *stegmanni*) *Sites of international importance (C. m. mongolus and stegmanni combined: 1% = 385; 0.25% = 96), cont.*

Site	Country	Name	Max Count	Date	Ref.
84	China	Deep Bay (incl. Mai Po & Futian)	500	14 Apr 91	*102*
		updated count	***179***	***01 May 07***	*102*
314	South Korea	Daebu Island	466	19 Aug 98	*146*
330	South Korea	Nakdong Estuary	443	01 Sep 84	*164*
323	South Korea	Hampyong Bay	410	29 Aug 98	*146*
114	China	Minjiang Estuary	400	01 May 11	*46*
311	South Korea	Asan Bay	400	01 May 98	*229*
136	China	Tianjin Coast	357	12 Apr 00	*17*
131	China	Sigeng Nature Reserve	200	20 Apr 13	*125*
144	China	Xinyingzhen	120	01 Aug 04	*125*
77	China	Changhua River	100	21 Apr 13	*125*
121	China	Qinglangang Nature Reserve	100	18 Apr 13	*125*

© Phil Battley. *Mixed flock at Rudong Mudflats, Jiangsu (Site #124)*

For a number of EAAF populations, difficulty in identifying individuals to subspecies, or even species, complicates estimates of population size and site use. For example, four recognized subspecies of **Lesser Sand Plover** occur in the EAAF, and these often cannot be distinguished, even from the very similar Greater Sand Plover, in the field.

LESSER SAND PLOVER
CHARADRIUS MONGOLUS STEGMANNI

EAAF population size: **13,000**

EAAF population trend: **Steep decline**

Global Red List status: **Least Concern**

19

Currently, the Lesser Sand Plover is considered a species of Least Concern, because its worldwide population trend is unknown[31]. However, the species is a candidate for upgrading to Near Threatened or Vulnerable based on recent rapid declines in East Asia[133]. Two of four populations in the EAAF (*C. m. mongolus* and *stegmanni*) may qualify for **Endangered** status at the regional level (criterion A2/3/4), due to substantial documented declines in the flyway, and recognition that further proposed degradation of intertidal staging habitats will perpetuate this decline[80]. Trends in the remaining EAAF populations are unknown.

Taxonomy

Five subspecies recognized, four of which occur in the EAAF. *C. m. atrifons* breeds in the Himalayas and winters from India to Southeast Asia and western Indonesia. *C. m. schaeferi* breeds in western and central China and winters in Southeast Asia and western Indonesia. *C. m. mongolus* breeds in northeastern Siberia and winters in southern China, Philippines, Indonesia, Papua New Guinea, and Australia. *C. m. stegmanni* breeds in far eastern Siberia and Kamchatka and winters in China, Japan, Philippines, eastern Indonesia, Melanesia, and Australia.

Population

Size: preliminary current population estimate for *C. m. stegmanni* of 13,000[210] derived by applying observed flyway declines[80] to previous population estimate of 20,000[8]. If derived population declines in *C. m. mongolus* and *stegmanni* are subtracted from the previous total EAAF estimate for the species (130,000[8]), the current flyway population for the species would be no more than 108,000.

Trend: non-breeding surveys in Australia have indicated a population decline of at least 50–79% (combined numbers of subspecies *C. m. mongolus* and *stegmanni*) in three generations (16 years)[80]. Numbers passing through Japan on southward migration (presumably also combined numbers of the two subspecies) have declined similarly (by 61% during 1978–2008)[1].

Distribution

Breeding: far northeastern Siberia and Kamchatka.

Non-breeding: China, Japan, Philippines, eastern Indonesia, Melanesia, and Australia, with small numbers in Japan. Non-breeders often remain in the non-breeding range year-round.

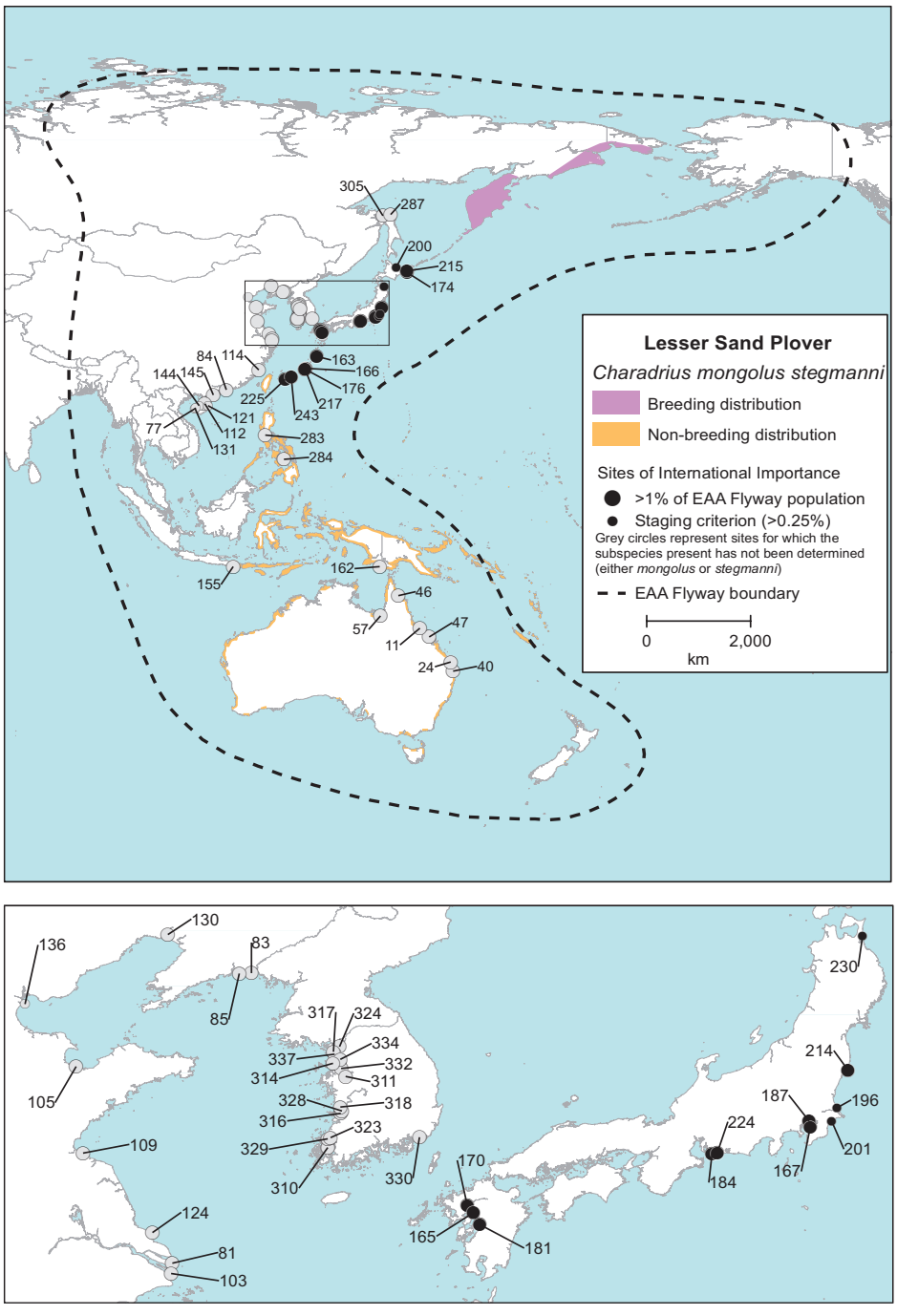
Migration: migration patterns of *C. m. mongolus* and *stegmanni* cannot be easily distinguished. Northward and southward migrations appear to follow similar routes through eastern Russia, the Yellow Sea, Japan, Philippines, and overland through China. Birds spending the non-breeding season in Australia may overfly much of Southeast Asia and Indonesia on both migrations.

Habitat

Breeding: well drained gravelly, rocky, or sandy surfaces with sparse vegetation, near water (bogs). In barren valleys and basins of elevated tundra and mountainous steppe, above tree line up to 5,500 m altitude. Also on dry edges of saltpans, grazing grounds, and saltmarshes.

Lesser Sand Plover (*C. m. stegmanni*)

Range and sites of international importance. Non-breeding range is shown for C. m. mongolus and stegmanni. Site details on next page.



Non-breeding and migration: almost strictly coastal in both non-breeding and migration, preferring sandy beaches, tidal flats, sandflats and dunes, coastal bays, and estuaries; occasionally uses mangrove mudflats. Other populations may use coastal airfields or inland lakes; not reported in this subspecies.

Major Threats

Loss and degradation of intertidal winter and staging areas, particularly in East Asia, through reclamation, pollution, disturbance, and reduced river flows. Unknown threats in the breeding season.

Lesser Sand Plover (*C. m. stegmanni*) *Sites of international importance (1% = 130; 0.25% = 33).*

Site	Country	Name	Max Count	Date	Ref.
225	Japan	Shiraho, Miyara-wan	900	01 May 98	*118*
174	Japan	Furen-ko	651	09 May 03	*114*
187	Japan	Inner Tokyo Bay	445	01 May 97	*115*
		updated count	***344***	***30 Apr 07***	*114*
166	Japan	Awase Higata	373	19 Feb 04	*114*
184	Japan	Ikawazu	337	28 Apr 02	*114*
167	Japan	Banzu	320	04 Aug 01	*114*
170	Japan	Daijugarami	300	29 Sep 10	*114*
176	Japan	Gushi Higata	300	23 Jan 10	*114*
243	Japan	Yonaha-wan	250	17 Jan 10	*114*
215	Japan	Notsuke-zaki, Odaito	227	30 Apr 11	*114*
224	Japan	Shio-kawa Higata	191	27 Apr 03	*114*
165	Japan	Arao Kaigan	152	26 Jan 12	*114*
217	Japan	Okina Higata	145	08 Jan 01	*114*
181	Japan	Hikawa Estuary, Shiranui	140	10 Sep 06	*114*
163	Japan	Amamioshima Oose-kaigan	130	17 Jan 13	*114*
214	Japan	Natsui-gawa Kako	130	14 Sep 08	*114*
230	Japan	Takasegawa Kako-Mutsuogawarakou	117	08 May 11	*114*
200	Japan	Komuke-ko	116	06 Sep 03	*114*
201	Japan	Kujukuri Coast	106	19 Aug 05	*114*
196	Japan	Kashima-nada	98	01 Aug 09	*114*

Lesser Sand Plover (unknown population – *C. m. mongolus* and *stegmanni*) *Sites of international importance (C. m. mongolus and stegmanni combined: 1% = 385; 0.25% = 96).*

Site	Country	Name	Max Count	Date	Ref.
316	South Korea	Dongjin River Estuary	4,320	01 Sep 97	*229*
328	South Korea	Mangyung River Estuary	4,100	01 Sep 97	*229*
155	Indonesia	Benoa Bay	4,000	15 Jan 96	*214*
124	China	Rudong Mudflats	3,820	01 Aug 08	*46*
324	South Korea	Han River Estuary	3,500	01 May 00	*184*
162	Indonesia	Wasur National Park	3,130	<1990	*184*
46	Australia	Pelican Island (incl. nearby islands)	2,150	25 Nov 87	*56*
57	Australia	SE Gulf of Carpentaria	2,146	01 Mar 99	*71*

Table continues

Knowledge Gaps Difficulty in distinguishing the subspecies during counts complicates determining population-specific estimates, trends, migration routes, and non-breeding ranges. No current estimates for subspecies breeding in western China and Himalayas. Unknown dependence on specific sites during migration.

General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3138

Lesser Sand Plover (unknown population – *C. m. mongolus* and *stegmanni*) *Sites of international importance (C. m. mongolus and stegmanni combined: 1% = 385; 0.25% = 96), cont.*

Site	Country	Name	Max Count	Date	Ref.
337	South Korea	Yeongjong Island	2,060	01 Sep 97	*229*
283	Philippines	Manila Bay	2,000	18 Jan 90	*214*
83	China	Dandong Port East	1,950	11 Sep 11	*46*
85	China	Yalujiang National Nature Reserve, Liaoning	1,950	01 Sep 11	*46*
284	Philippines	Olango Island	1,940	Oct 89	*135*
81	China	Chongming Dongtan National Nature Reserve	1,790	02 May 90	*195*
40	Australia	Moreton Bay	1,770	<1988	*121*
317	South Korea	Ganghwa Tidal Flat	1,700	01 Sep 97	*229*
318	South Korea	Geum River Estuary (incl. Yubu Island)	1,691	Mid-May 06	*175*
332	South Korea	Namyang Bay	1,610	01 Sep 97	*229*
47	Australia	Pioneer River – McEwan's Beach	1,575	01 Jan 93	*6*
11	Australia	Burdekin River Delta	1,540	18 Nov 95	*6*
24	Australia	Great Sandy Strait	1,430	<1988	*121*
310	South Korea	Aphae Island	1,144	01 May 98	*146*
103	China	Jiu Duan Sha National Nature Reserve	1,044	01 Jun 06	*46*
334	South Korea	Songdo Tidal Flat	1,000	2006–2010	*34*
305	Russia	Schastiya Bay	906	01 Sep 02	*4*
105	China	Laizhou Wan	877	10 May 04	*18*
329	South Korea	Muan-gun Tidal Flat	862	29 Aug 98	*146*
109	China	Lianyungang Coast	835	01 Sep 12	*46*
130	China	Shuangtaizihekou National Nature Reserve	682	12 May 98	*20*
		updated count	***400***	***01 Aug 11***	*46*
145	China	Xitou	658	22 Mar 12	*136*
112	China	Meilisha Reclamation Pools, Haikou	552	18 Jan 09	*125*
287	Russia	Baikal Bay	500	11 Aug 79	*154*
84	China	Deep Bay (incl. Mai Po & Futian)	500	14 Apr 91	*102*
		updated count	***179***	***01 May 07***	*102*
314	South Korea	Daebu Island	466	19 Aug 98	*146*
330	South Korea	Nakdong Estuary	443	01 Sep 84	*164*
323	South Korea	Hampyong Bay	410	29 Aug 98	*146*
114	China	Minjiang Estuary	400	01 May 11	*46*
311	South Korea	Asan Bay	400	01 May 98	*229*
136	China	Tianjin Coast	357	12 Apr 00	*17*
131	China	Sigeng Nature Reserve	200	20 Apr 13	*125*
144	China	Xinyingzhen	120	01 Aug 04	*125*
77	China	Changhua River	100	21 Apr 13	*125*
121	China	Qinglangang Nature Reserve	100	18 Apr 13	*125*

GREATER SAND PLOVER
CHARADRIUS LESCHENAULTII LESCHENAULTII

EAAF population size: **79,000**

EAAF population trend: **Strong decline**

Global Red List status: **Least Concern**

20

Globally, the Greater Sand Plover is considered a species of Least Concern, due to its wide distribution and unknown worldwide population trend[31]. However, the species is a candidate for upgrading to Near Threatened status based on steep declines in the East Asian subspecies *C. l. leschenaultii*[133]. The portion of this subspecies using the EAAF appears to be sufficiently declining to qualify for **Vulnerable** status at the regional level (criterion A2/3/4).

Taxonomy

There are three recognized subspecies: *C. l. columbinus*, *crassirostris*, and *leschenaultii*. One subspecies occurs in the EAAF: *C. l. leschenaultii* breeds in central Asia and migrates through both the EAAF and Central Asian Flyway.

Population

Size: preliminary current flyway population estimate of 79,000[210] derived by applying observed flyway declines[80] to previous population estimate of 110,000[8].

Trend: non-breeding surveys in Australia have indicated a population decline of 30–49% in three generations (17 years)[80]. Although small, numbers migrating through Japan have slightly increased over the same time period[1]. Trends elsewhere in the flyway are unknown.

Distribution

Breeding: western China, Mongolia, and southern Siberia.

Non-breeding: approximately 75% in coastal Australia, but also Papua New Guinea, Indonesia, Philippines, Southeast Asia, and southern Japan. Apparently strong site fidelity to non-breeding sites. Juveniles and non-breeders often remain in the non-breeding range year-round.

Migration: range of migration strategies poorly described. All birds tracked from Australia with geolocators made stops between non-breeding sites and mainland China in Southeast Asia, Indonesia, or the Philippines on both northward and southward migrations, although these routes often differed within and between individuals[140,144]. Some birds made direct flights between breeding areas and coastal stopover sites, whereas others made multiple mainland stops.

Habitat

Breeding: desert or semi-desert, at lower altitudes than *C. mongolus* (up to 4,000 m). Prefers open, bare, and dry areas, usually near water.

Non-breeding and migration: mainly coastal beaches (sand, shell, or mud) and estuaries with large tidal flats and sandbanks. Also reefs, rocky islands, and dunes. Occasionally in saltlakes and brackish swamps.

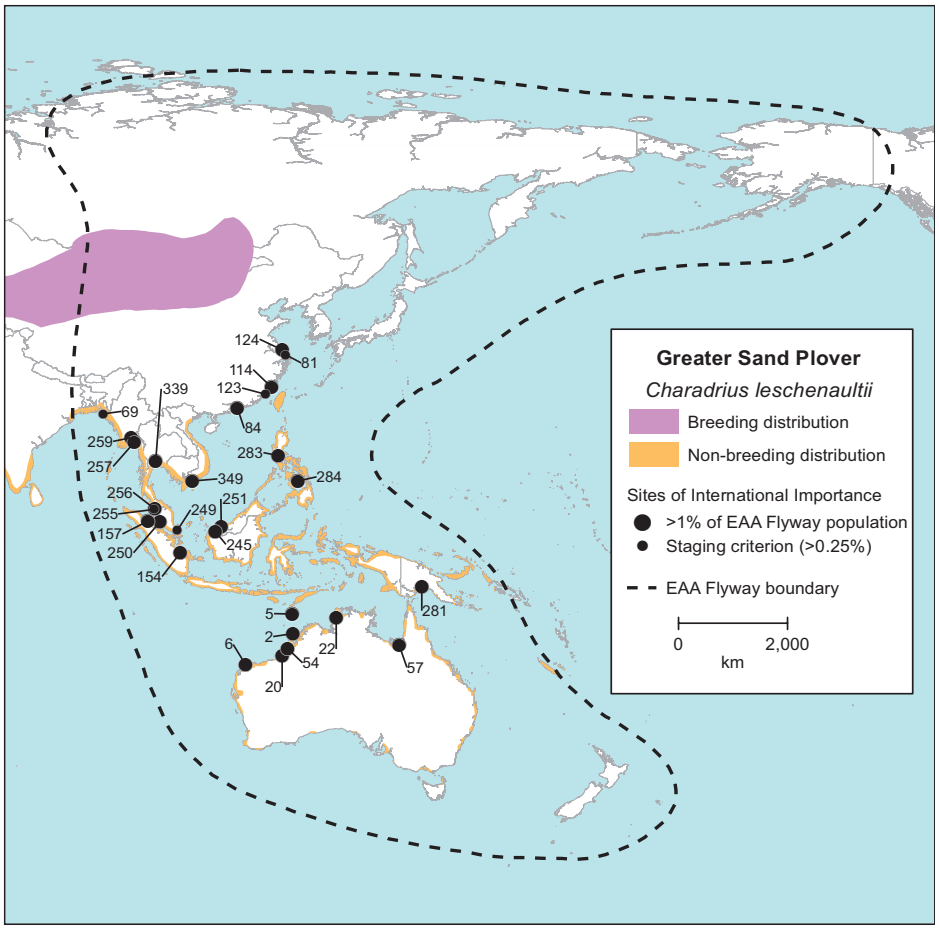
Major Threats

Generally threatened by degradation of coastal migratory and non-breeding sites through reclamation, pollution, disturbance, reduced river flows, and invasive plants.

Knowledge Gaps

Breeding threats largely unknown on this flyway. Migratory strategies and possible use of inland sites poorly understood.

Greater Sand Plover
Range and sites of international importance. Site details on next page.



General Information http://www.birdlife.org/datazone/speciesfactsheet.php?id=3139

Greater Sand Plover *Sites of international importance (1% = 790; 0.25% = 198).*

Site	Country	Name	Max Count	Date	Ref.
20	Australia	Eighty Mile Beach	63,482	17 Oct 98	*5*
		updated count	***42,166***	***01 Nov 12***	*6*
54	Australia	Roebuck Bay	26,900	<1984	*120*
			22,318	01 Dec 10	*6*
250	Malaysia	North-central Selangor Coast	4,800	05 Apr 11	*33*
251	Malaysia	Pulau Bruit	3,137	01 Sep 85	*151*
349	Vietnam	Hoa Trinh	3,000	20 Dec 00	*147*
84	China	Deep Bay (incl. Mai Po & Futian)	2,700	09 Apr 89	*102*
		updated count	***773***	***13 Apr 10***	*102*
5	Australia	Ashmore Reef	2,559	01 Feb 05	*193*
57	Australia	SE Gulf of Carpentaria	2,504	01 Mar 99	*71*
283	Philippines	Manila Bay	2,464	16 Jan 90	*214*
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	2,180	08 Oct 05	*59*
2	Australia	Adele Island	2,046	21 Nov 04	*37*
154	Indonesia	Banyuasin Delta	2,000	01 Oct 88	*202*
284	Philippines	Olango Island	2,000	05 May 87	*151*
339	Thailand	Inner Gulf of Thailand	1,945	Jan 06	*179*
22	Australia	Fog Bay	1,800	15 Jul 98	*45*
114	China	Minjiang Estuary	1,780	01 Sep 08	*46*
281	Papua New Guinea	Kikori Delta	1,700	20 Mar 00	*212*
256	Malaysia	Teluk Air Tawar-Kuala Muda Coast	1,650	Jan–Apr 05	*126*
124	China	Rudong Mudflats	1,600	14 Aug 11	*46*
259	Myanmar	Moyingyi Bird Sanctuary	1,500	14 Jan 96	*214*
257	Myanmar	Inner Gulf of Martaban	1,320	Winter 2008	*232*
6	Australia	Barrow Island	1,158	2003–04	*9*
245	Malaysia	Bako-Buntal Bay	1,040	<2008	*228*
69	Bangladesh	Sonadia & Moheskhali Island	700	13–19 Mar 12	*52*
81	China	Chongming Dongtan National Nature Reserve	481	02 May 90	*195*
123	China	Quanzhou Wan	462	01 Aug 11	*46*
249	Malaysia	Mersing Estuary/Mersing Bay	200	17 Aug 12	*33*
255	Malaysia	Tanjung Tokong Mudflats	200	07 Sep 08	*33*

© Phil Battley. *Yalujiang National Nature Reserve, Liaoning (Site #85)*

Up to 16 of 20 priority shorebird populations on the EAAF use the Yalujiang National Nature Reserve, China (Site #85) in internationally important numbers.

REFERENCES

1 Amano, T., T. Székely, K. Koyama, H. Amano & W.J. Sutherland. 2010. A framework for monitoring the status of populations: An example from wader populations in the East Asian-Australasian flyway. Biological Conservation 143: 2238-2247; see also 2012 addendum: Biological Conservation 2145: 2278-2295.

2 An, S., Z. Tian, Y. Cai, T. Wen, D. Xu, H. Jiang, Z. Yao, B. Guan, S. Sheng, Y. Ouyang & X. Chen. 2013. Wetlands of Northeast Asia and High Asia: an overview. Aquatic sciences 75: 63-71.

3 Andres, B.A., P.A. Smith, R.I.G. Morrison, C.L. Gratto-Trevor, S.R. Brown & C.A. Friis. 2012. Population estimates of North American shorebirds, 2012. Wader Study Group Bulletin 119: 178-194.

4 Antonov, A. 2003. A shorebird census of Schastya Bay and the Amur estuary, Sea of Okhotsk, Russia from 6 August–21 September 2002. Stilt 44: 52-55.

5 Australasian Wader Studies Group. 1998. Unpubl. count of waders at 80 Mile Beach, north-west Australia, October 1998.

6 Australasian Wader Studies Group. 2014. Shorebird count database. Birds Australia, Melbourne.

6.1 Bakewell, D. 2014. Personal records.

7 Bakewell, D. & A. Wong. 2014. Waterbirds Survey of the Sarawak Coast, 2010–2012.

8 Bamford, M., D. Watkins, W. Bancroft, G. Tischler & J. Wahl. 2008. Migratory shorebirds of the East Asian-Australasian Flyway: population estimates and internationally important sites. Wetlands International - Oceania, Canberra.

9 Bamford, M. & D. Moro. 2011. Barrow Island as an Important Bird Area for Migratory Waders in the East Asian-Australasian Flyway. Stilt 60: 46-55.

10 Bamford, M.J. 1988. Kakadu National Park: a preliminary survey of migratory waders October/November 1987. RAOU Report No. 60. Royal Australian Ornithologists Union, Melbourne, Australia.

11 Bamford, M.J. 2004. Personal records.

12 Barter, M., D. Tonkinson, S.X. Tang, X. Yuan & F.W. Qian. 1997. Wader numbers on Chongming Dao, Yangtze estuary, China, during early 1996 northward migration and the conservation implications. Stilt 30: 7-13.

13 Barter, M., J. Wilson, Z.W. Li, Y.X. Li, H.S. Tian & C. Tian. 2000. Shorebird numbers in the proposed Linghekou Provincial Nature Reserve, Liaoning Province, China, during the 1999 Northward Migration. *In:* Shorebird surveys in China (1999) (K. Chen, Z.W. Li, M. Barter, J. Wilson, D. Watkins & J. Yuan, Eds.). Wetlands International - China & Oceania.

14 Barter, M., A. Riegen, Z.W. Li, Z.G. Dong, R.J. Cao & L.S. Jiang. 2000. A comparison of shorebird numbers in the Yalu Jiang National Nature Reserve, Liaoning Province, China, during the 1999 and 2000 northward migrations. *In:* Shorebird surveys and training in China (2000) (K. Chen, Z.W. Li, M. Barter & D. Watkins, Eds.). Wetlands International - China & Oceania.

15 Barter, M. 2002. Shorebirds of the Yellow Sea: importance, threats and conservation status. Wetlands International Global Series 9 & International Wader Studies 12. Wetlands International & International Wader Study Group.

16 Barter, M., J.J. Du, H. Wang, Y.Q. Chen, Z.D. Gao, H. Cheng & C.R. Li. 2002. Shorebird numbers in the Yancheng National Nature Reserve during the 2001 northward migration. Stilt 41: 27-34.

17 Barter, M., A. Riegen & Q. Xu. 2003. Shorebird numbers in Bohai Wan during northward migration. Stilt 44: 3-8.

18 Barter, M. 2004. Shorebird activities in China 18 April–17 May 2004. Unpubl. report to Wetlands International - Oceania & the Department of Environment and Heritage. Australasian Wader Studies Group.

19 Barter, M., K. Gosbell, L. Cao & Q. Xu. 2005. Northward shorebird migration survey in 2005 at four new Yellow Sea sites in Jiangsu and Liaoning provinces. Stilt 48: 13-17.

20 Barter, M.A., J.R. Wilson, Z.W. Li, Y.X. Li, C.Y. Yang, X.J. Li, Y.F. Liu & H.S. Tian. 2000. Northward migration of shorebirds in the Shuangtaizihekou National Nature Reserve, Liaoning province, China in 1998 and 1999. Stilt 37: 2-10.

21 Battley, P.F., D.I. Rogers, J.A. van Gils, T. Piersma, C.J. Hassell, A. Boyle & Y. Hong-Yan. 2005. How do red knots *Calidris canutus* leave Northwest Australia in May and reach the breeding grounds in June? Predictions of stopover times, fuelling rates and prey quality in the Yellow Sea. Journal of Avian Biology 36: 494-500.

22 Battley, P.F., D.I. Rogers & C.J. Hassell. 2006. Prebreeding moult, plumage and evidence for a presupplemental moult in the great knot *Calidris tenuirostris*. Ibis 148: 27-38.

23 Battley, P.F., R. Schuckard & D.S. Melville. 2011. Movements of bar-tailed godwits and red knots within New Zealand. Science for Conservation No. 315. New Zealand Department of Conservation.

24 Battley, P.F., N. Warnock, T.L. Tibbitts, R.E. Gill, Jr., T. Piersma, C.J. Hassell, D.C. Douglas, D.M. Mulcahy, B.D. Gartrell, R. Schuckard, D. Melville & A. Riegen. 2012. Contrasting extreme long-distance migration patterns in bar-tailed godwits *Limosa lapponica*. Journal of Avian Biology 43: 21-32.

25 Battley, P.F. 2014. Unpubl. data.

26 Bird Conservation Society of Thailand. 2000. Bulletin 17, no. 10 (in Thai).

27 Bird Conservation Society of Thailand. 2004. Bulletin 21, no. 1 (in Thai).

28 Bird Conservation Society of Thailand. 2014. Waterbird records database.

29 Bird, J.P., A.C. Lees, S.U. Chowdhury, R. Martin, R. Halder & E. Ul Haque. 2010. Observations of globally threatened shorebirds in Bangladesh. BirdingAsia 14: 53-58.

30 BirdLife Asia. 2014. Bird database.

31 BirdLife International. 2013. Species factsheets: IUCN Red List for birds. Accessed 9 May 2013 at: http://www.birdlife.org/datazone/species/search

32 BirdLife Vietnam. 1997. Record counts of Spoon-billed Sandpipers in Vietnam. Tattler 11: 6.

33 Birds I Witness - Malaysia. 2014. Web-based database.

34 Birds Korea. 2010. Letter to Songdo University Global Campus regarding Songdo Tidal Flat: “Investing in Wetland Infilling”.

35 Bishop, K.D. 2006. Shorebirds in New Guinea: Their status, conservation and distribution. Stilt 50: 103-134.

36 Boere, G.C. & D.A. Stroud. 2006. The flyway concept: what it is and what it isn’t. Pages 40-47 *in:* Waterbirds around the world (G.C. Boere, C.A. Galbraith & D.A. Stroud, Eds.). The Stationery Office, Edinburgh.

37 Boyle, A., G. Swann, T. Willing, T. Gale & L. Collins. 2005. Adele Island Bird Survey Report. Unpubl. report to the Department of Conservation and Land Management, Western Australia.

38 Brazil, M. 1991. The Birds of Japan. Christopher Helm Publishers Ltd, London.

39 Brown, D., N. Crockford & R. Sheldon. (Eds.) *In prep*. Drivers of population change and conservation priorities for the Numeniini populations of the world. Report by Royal Society for the Protection of Birds.

40 Buehler, D.M. & T. Piersma. 2008. Travelling on a budget: predictions and ecological evidence for bottlenecks in the annual cycle of long-distance migrants. Philosophical Transactions of the Royal Society of London, Series B: Biological Sciences 363: 247-266.

41 Cao, L., S. Tang, X. Wang & M. Barter. 2009. The importance of eastern China for shorebirds during the non-breeding season. Emu 109: 170-178.

42 Cao, L. 2013. Unpubl. waterbird count data from surveys by Cao Lei, Mark Barter and associates in China from 2004 to 2011.

43 Carey, G.J., M.L. Chalmers, D.A. Diskin, P.R. Kennerley, P.J. Leader, M.L. Leven, R.W. Lewthwaite, D.S. Melville, M. Turnbull & L. Young. 2001. The Avifauna of Hong Kong. Hong Kong Bird Watching Society, Hong Kong.

44 Chatto, R. 2000. A Management Strategy and Protected Areas System for Coastal Wildlife. Report to the National Wetlands Program. Parks and Wildlife Commission of the Northern Territory, Palmerston, Australia.

45 Chatto, R. 2003. The distribution and status of shorebirds around the coast and coastal wetlands of the Northern Territory. Tech. report 73, Parks and Wildlife Commission of the Northern Territory, Palmerston, Australia.

46 China Coastal Waterbird Census Team. 2014. Records database.

47 China Ornithological Society. 2005. China Bird Report 2004. China Ornithological Society, Beijing.

48 China Ornithological Society. 2006. China Bird Report 2005. China Ornithological Society, Beijing.

49 Choi, C.-Y. 2014. Pers. comm.

50 Chowdhury, S.U., M. Foysal, D.K. Das, S. Mohsanin, M.A.A. Diyan & A.B.M.S. Alam. 2011. Seasonal occurrence and site use by shorebirds at Sonodia Island, Cox's Bazar, Bangladesh. Wader Study Group Bulletin 118: 77-81.

51 Chowdhury, S.U. & M. Foysal. 2012. Bangladesh Spoon-billed Sandpiper Conservation Project. Brief Project Update - August 2012.

52 Chowdhury, S.U. & M. Foysal. 2013. Bangladesh Spoon-billed Sandpiper Conservation Project. Brief Project Update - June 2013.

53 Conklin, J.R. & P.F. Battley. 2011. Contour feather moult of bar-tailed godwits (*Limosa lapponica baueri*) in New Zealand and the Northern Hemisphere reveals multiple strategies by sex and breeding region. Emu 111: 330-340.

54 Conklin, J.R. & P.F. Battley. 2011. Impacts of wind on individual migration schedules of New Zealand bar-tailed godwits. Behavioral Ecology 22: 854-861.

55 Convention on the Conservation of Migratory Species of Wild Animals. Online at: http://www.cms.int/en/legalinstrument/cms

56 Cornelius, J. 1988. Waders in the far northern Great Barrier Reef. Stilt 12: 54-55.

57 Crossland, A.C., S. Sinambela, A.S. Sitorus & A.W. Sitorus. 2009. The coastal zone of Asahan regency: an area of international importance for migratory waders in North Sumatra province, Indonesia. Stilt 55: 8-12.

58 Crossland, A.C. & A. Sitorus. 2011. Red Knot (*Calidris canutus*) on southward migration through northern Sumatra – discovery of important staging sites and evidence of links with China and north-west Australia. Stilt 59: 55-57.

59 Crossland, A.C., L. Lubis, S.A. Sinambela, A.S. Sitorus, A.W. Sitorus & A. Muis. 2012. Observations of shorebirds along the Deli-Serdang coast, North Sumatra Province, Indonesia. Stilt 61: 37-44.

60 Daesan Regional Maritime Affairs & Port Office. 2010. Report of Civilian Monitoring on Wetland Protected Areas (Seocheon WPA).

61 Danielsen, F. & H. Skov. 1989. The importance of South-east Sumatra as a summering area for non-breeding waders, especially the Bar-tailed Godwit *Limosa lapponica*. Stilt 14: 40-42.

62 Davidson, N. 2011. Drivers of migratory waterbird status: habitat loss, land claim and hunting. Pages 17-21 *in:* Global Flyways Workshop, Seosan City, South Korea.

63 Degen, A., A. Hergenhahn & H. Kruckenberg. 1998. Wader migration in Babushkina Bay, Russian Far East, June-August 1995. Wader Study Group Bulletin 85: 75-79.

64 Delaney, S. & D. Scott. 2002. Waterbird population estimates - Third Edition. Wetlands International Global Series No. 12, Wageningen, The Netherlands.

65 Delany, S., S. Nagy & N. Davidson. 2010. State of the World's Waterbirds. Wetlands International, Ede, The Netherlands.

66 Dierschke, J. & F. Heintzenberg. 1994. Happy Island & Beidaihe Bird Report.

67 Dorofeev, D.S. & F.V. Kazansky. 2013. Post-breeding stopover sites of waders in the estuaries of the Khairusovo, Belogolovaya and Moroshechnaya rivers, western Kamchatka Peninsula, Russia, 2010–2012. Wader Study Group Bulletin 120: 119-123.

68 Driscoll, P. 1991. Survey of waterbird, seabird and wader feeding areas and roosts in Pumicestone Passage, spring 1990. Unpubl. report to Queensland Department of Environment and Heritage, Brisbane, Australia.

69 Driscoll, P.V. 1990. Survey of shorebird feeding areas and high tide roosts in the Great Sandy Strait, summer 1990. Unpubl. report to the Queensland Department of the Environment, Brisbane, Australia.

70 Driscoll, P.V. 1996. The distribution of waders along the Queensland coastline. Report by the Queensland Ornithological Society & the Queensland Wader Studies Group to the Queensland Department of Environment and Heritage, Brisbane, Australia.

71 Driscoll, P.V. 2001. Gulf of Carpentaria wader surveys 1998-9. Unpubl. report to Queensland Environmental Protection Agency, Brisbane, Australia.

72 Driscoll, P.V. & M. Ueta. 2002. The migration route and behaviour of Eastern Curlews *Numenius madagascariensis*. Ibis 144: E119-E130.

73 East Asian-Australasian Flyway Partnership. 2008. Nakdong Estuary. EAAFP Flyway Site Network information sheets.

74 Edwards, P.J. & D. Parish. 1986. Evaluation of Sarawak Wetlands and their importance to waterbirds, report No. 2: Western Sarawak. Interwader publication No. 6. Interwader, Kuala Lumpur, Malaysia.

75 Eiam-Ampai, K., S. Nimnuan, T. Sonsa, S. Sutibut & P.D. Round. 2011. The first record of over-summering Spoon-billed Sandpiper *Eurynorhynchus pygmeus* in Thailand. Stilt 60: 56-57.

76 Engelmoer, M. & C.S. Roselaar. 1998. Geographic Variation in Waders. Kluwer Academic Publishers, Dordrecht.

77 Environment Agency of Japan. 1997. Inventory of wetlands used by migratory shorebirds. Environment Agency of Japan, Wildlife Conservation Bureau, Tokyo (in Japanese).

78 Eun-Young, K. & W. Pyong-Oh. 1993. Ecology of Waders migrating to Kanghwa and Yongjong Islands on the west coast of Korea. Bulletin of the Institute of Ornithology, Kyung University, Seoul 4: 25-46.

79 Garnett, S. & A. Taplin. 1990. Wading bird abundance and distribution during the wet season – south-west coast of the Gulf of Carpentaria. Report to Conservation Commission of the Northern Territory. Royal Australian Ornithologists Union, Melbourne, Australia.

80 Garnett, S., J. Szabo & G. Dutson. 2011. Action Plan for Australian Birds 2010. CSIRO, Collingwood.

81 George, L. 2009. Shorebirds and their known habitat/status in the Gascoyne region, Western Australia. Stilt 55: 40-50.

82 Gerasimov, N.N. & Y.N. Gerasimov. 2000. Spring migration of Dunlin *Calidris alpina* in Kamchatka. *In:* The biology and conservation of the birds of Kamchatka 2: 91-95. Russian Academy of Science, Moscow.

83 Gerasimov, Y., Y. Artukhin, N. Gerasimov & E. Lobkov. 1999. Status of shorebirds in Kamchatka. Stilt 34: 31-34.

84 Gerasimov, Y. 2004. Southward migration in 2003 of shorebirds at the Penzhina River mouth, Kamchatka, Russia. Stilt 45: 34-39.

85 Gerasimov, Y.N. 1999. Observation of the spring migration of waders in the Korf Bay. *In:* The biology and conservation of the birds of Kamchatka 1: 73-76. Russian Academy of Science, Moscow.

86 Gerasimov, Y.N. & N.N. Gerasimov. 1999. A register of important waterfowl wetlands in Kamchatka. *In:* The biology and conservation of the birds of Kamchatka 1: 37-46. Russian Academy of Science, Moscow.

87 Gerasimov, Y.N. 2001. Northward migration of shorebirds at Kharchinskoe Lake, Kamchatka, Russia. Stilt 39: 41-44.

88 Gill, R.E. 1996. Alaska shorebirds: status and conservation measures at a terminus of the East Asian-Australasian Flyway. Pages 21-42 *in:* Conservation of Migratory Waterbirds and their Wetland Habitats in the East Asian-Australasian Flyway (D.R. Wells & T. Mundkur, Eds.).

89 Gill, R.E., Jr. & B.J. McCaffery. 1999. Bar-tailed godwits *Limosa lapponica* in Alaska: a population estimate from the staging grounds. Wader Study Group Bulletin 88: 49-54.

90 Gopal, B. 2013. Future of wetlands in tropical and subtropical Asia, especially in the face of climate change. Aquatic Sciences 75: 39-61.

91 Gosbell, K. & M. Christie. 2004. Wader surveys in the Coorong & SE coastal lakes. Australasian Wader Studies Group.

92 Groen, N., R. Mes, I. Fefelov & I. Tupitsyn. 2006. Eastern Black-tailed Godwits *Limosa limosa melanuroides* in the Selenga Delta, Lake Baikal, Siberia. Wader Study Group Bulletin 110.

93 Harrison, F. 1996. A Whimbrel *Numenius phaeopus* phenomenon in Cairns, Australia. Stilt 29: 38.

94 Harrison, F. 1997. Cape Bowling Green, North Queensland; a site of significance for Godwits. Stilt 31: 41.

95 Hassell, C., A. Boyle & M. Slaymaker. 2011. Red Knot northward migration through Bohai Bay, China. Field Trip Report April & May 2011. Global Flyway Network/Australasian Wader Studies Group.

96 Hassell, C., I. Southey, A. Boyle & H.-Y. Yang. 2011. Red Knot *Calidris canutus*: subspecies and migration in the East-Asian-Australasian flyway – where do all the Red Knot go? Birding Asia 16: 89-93.

97 Hassell, C., A. Boyle, M. Slaymaker & Y.-C. Chan. 2012. Red Knot northward migration through Bohai Bay, China. Field Trip Report April & May 2012. Global Flyway Network/ Australasian Wader Studies Group.

98 Hassell, C., A. Boyle, M. Slaymaker, Y.-C. Chan & T. Piersma. 2013. Red Knot northward migration through Bohai Bay, China. Field Trip Report April–June 2013. Global Flyway Network/Australasian Wader Studies Group.

99 Hassell, C. 2014. Unpubl. data.

100 Holmes, R.T. 1966. Molt cycles of the Red-backed Sandpiper (*Calidris alpina*) in western North America. Auk 83: 517-533.

101 Hong Kong Bird Watching Society. 2011. China Coastal Waterbird Census Report (1.2008–12.2009), 175 pp. (in Chinese).

102 Hong Kong Bird Watching Society. 2013. Waterbird records database.

103 Howes, J.R. 1986. Evaluation of Sarawak Wetlands and their importance to waterbirds, report no. 3: Pulau Bruit. Interwader Publication No. 10. Interwader, Kuala Lumpur, Malaysia.

104 Huettmann, F. & Y. Gerasimov. 2002. Using Distance Sampling to obtain density estimates for Whimbrels (*Numenius phaeopus*) and other birds in the coastal tundra of the Moroshechnaya River Spit, Sea of Okhotsk, during fall migration. Avian Ecology & Behaviour 8: 49-69.

105 Huettmann, F. 2004. Findings from the 'Southward Shorebird Migration' expedition to Aniva Bay (Sakhalin Island) and Iturup (Kurile Islands), August 2003. Stilt 45: 6-12.

106 International Union of the Conservation of Nature. 2012. IUCN Red List Categories and Criteria; Version 3.1, Second edition. IUCN, Gland, Switzerland & Cambridge, UK.

107 International Union of the Conservation of Nature. 2012. Guidelines for Application of IUCN Red List Criteria at Regional and National Levels; Version 4.0. IUCN, Gland, Switzerland & Cambridge, UK.

108 Iqbal, M., G. Giyanto & H. Abdillah. 2010. Wintering shorebirds migrate during January 2009 along the east coast of North Sumatra Province, Indonesia. Stilt 58: 18-23.

109 Iqbal, M., A. Ridwan & Herman. 2011. Notes on the wintering waders in November 2009 along the east coast of Lampung Province, southernmost Sumatra, Indonesia. Stilt 59: 58-60.

110 Iqbal, M., D. Priatna & R. Dedi. 2012. Notes on the early northward migration of Sumatran waders on the east coast of Jambi Province, Indonesia, in 2011. Stilt 61: 45-50.

111 Iwamura, T., H.P. Possingham, I. Chadès, C. Minton, N.J. Murray, D.I. Rogers, E.A. Treml & R.A. Fuller. 2013. Migratory connectivity magnifies the consequences of habitat loss from sea-level rise for shorebird populations. Proceedings of the Royal Society B: Biological Sciences 280: 20130325.

112 Jaensch, R. 1989. Observations. Western Australian Bird Notes 50: 3.

113 Jaensch, R.P. & R.M. Vervest. 1990. Waterbirds at remote wetlands in Western Australia 1986-88, part 2: Lake MacLeod, Shark Bay, Camballin Floodplain and Parry Floodplain. RAOU Report No. 69. Royal Australian Ornithologists Union, Melbourne, Australia.

113.1 Jaensch, R. 2013. New tools for development of the Flyway Site Network: An integrated and updated list of candidate sites and guidance on prioritisation. Report to Partnership for the East Asian-Australasian Flyway.

114 Japan Bird Research Association. 2013. Bird record database.

115 Japan Wetland Action Network. 1997. National count of shorebirds in Japan, spring 1997. JAWAN, Nagoya, Japan.

116 Japan Wetland Action Network. 1998. National count of shorebirds in Japan, autumn 1998. JAWAN, Nagoya, Japan.

117 Japan Wetland Action Network. 1998. National count of shorebirds in Japan, autumn 1997. JAWAN, Nagoya, Japan.

118 Japan Wetland Action Network. 1998. National count of shorebirds in Japan, spring 1998. JAWAN, Nagoya, Japan.

119 Kondratyev, A.V. & A.V. Andreev. 1998. Probable breeding of the Nordmann's Greenshank, *Tringa guttifer* in Magadan Region, Far East. Page 50 *in:* Information materials of the working group on waders, vol. 11 (P.S. Tomkovich, Ed.) (in Russian).

120 Lane, B., C. Minton & A. Jessop. 1983. North-west Australia Wader Studies Expedition. Report to participants. Unpubl. report, Royal Australian Ornithologists Union, Melbourne, Australia.

121 Lane, B.A. & J. Davies. 1987. Shorebirds in Australia. Nelson, Melbourne.

122 Lappo, E.G., P.S. Tomkovich & E.E. Syroechkovskiy. 2012. Atlas of breeding waders in the Russian Arctic. UF Ofsetnaya Pechat, Moscow.

123 Lee, K.-S. 1997. Shorebirds in Western Korea, 1996. Department of Biology, Kyung Hee University, Seoul.

124 Lei, G., Y. Jiang & Y. Yao. 2002. Waders of East Dongting Lake National Nature Reserve, Hunan Province, China. Stilt 41: 11-13.

125 Lewthwaite, R. 2013. Personal records.

126 Li, Z.W.D., C.A. Yeap, K.C. Lim, K. Kumar, A.T. Lim, C. Yang & W.M. Choy. 2006. Shorebird surveys of the Malaysian coast November 2004–April 2005. Stilt 49: 7-18.

127 Li, Z.W.D., A. Bloem, S. Delany, G. Martakis & J.O. Quintero. 2009. Status of Waterbirds in Asia: Results of the Asian Waterbird Census, 1987–2007. Wetlands International, Kuala Lumpur, Malaysia.

128 Liu, W. 2003. Pers. comm. to M. Bamford, 10 October 2003.

129 Livezey, B.C. 2010. Phylogenetics of modern shorebirds (Charadriiformes) based on phenotypic evidence: analysis and discussion. Zoological Journal of the Linnean Society 160: 567-618.

130 Lobkov, E. 1998. Main concentrations of migrating waders on the Kamchatka Peninsula. *In:* Migration and International Conservation of Waders: Research and Conservation on North Asian, African, and European Flyways (H. Hötker, E. Lebedeva, P.S. Tomkovich, J.Gromadzka, N.C. Davidson, J. Evans, D.A. Stroud & R.B. West, Eds.). International Wader Studies 10: 233-236. International Wader Study Group.

131 Lobkov, E.G. 1984. Shallow water lagoons and bays of Kamchatka. Pages 256-258 *in:* Modern condition of resources of waterbirds. Moscow. (in Russian).

132 Ma, Z., K. Jing, S. Tang & J. Chen. 2002. Shorebirds in the eastern intertidal areas of Chongming Island during the 2001 northward migration. Stilt 41: 6-10.

133 MacKinnon, J., Y.I. Verkuil & N. Murray. 2012. IUCN situation analysis on East and Southeast Asian intertidal habitats, with particular reference to the Yellow Sea (including the Bohai Sea). Occasional Paper of the IUCN Species Survival Commission No. 47. IUCN, Gland, Switzerland & Cambridge, UK.

134 Maftei, M. 2010. United States Geological Survey, Alaska Science Center. Unpubl. data.

135 Magsalay, P., R. Rigor, A.M. Mapalo, H. Gonzales & M. Fe Portigo. 1989. Waterbird monitoring on Olango Island, Philippines, 1989. Stilt 17: 54-56.

136 Martinez, J. 2013. Personal records.

137 McCaffery, B.J., J. Bart, C. Wightman & D. Kreuper. 2012. Shorebird surveys in western Alaska. *In:* Arctic shorebirds in North America: a decade of monitoring. Studies in Avian Biology Series, Vol. 44 (J. Bart & V.H. Johnston, Eds.). University of California Press, Berkeley, California.

138 Melville, D.S. 2014. Pers. comm.

139 Melville, D.S., Y.N. Gerasimov, N. Moores, Y. Yat-Tung & Q. Bai. 2014. Conservation assessment of Far Eastern Oystercatcher *Haematopus [ostralegus] osculans*. *In:* Conservation Status of Oystercatchers Around the World (B.J. Ens & L.G. Underhill, Eds.). International Wader Studies 20. International Wader Study Group.

140 Minton, C., K. Gosbell, P. Johns, M. Christie, M. Klaassen, C. Hassell, A. Boyle, R. Jessop & J. Fox. 2011. Geolocator studies on Ruddy Turnstones *Arenaria interpres* and Greater Sandplovers *Charadrius leschenaultii* in the East Asian-Australasia Flyway reveal widely different migration strategies. Wader Study Group Bulletin 118: 87-96.

141 Minton, C., J. Wahl, H. Gibbs, R. Jessop, C. Hassell & A. Boyle. 2011. Recoveries and flag sightings of waders which spend the non-breeding season in Australia. Stilt 59: 17-43.

142 Minton, C., P. Dann, A. Ewing, S. Taylor, R. Jessop, P. Anton & R. Clemens. 2012. Trends of Shorebirds in Corner Inlet, Victoria, 1982–2011. Stilt 61: 3-18.

143. Minton, C., M. Connor, D. Price, R. Jessop, P. Collins, H. Sitters, C. Hassell, G. Pearson & D. Rogers. 2013. Wader numbers and distribution on Eighty Mile Beach, north-west Australia: baseline counts for the period 1981–2003. Conservation Science Western Australia 8: 345-366.

144 Minton, C., K. Gosbell, P. Johns, M. Christie, M. Klaassen, C. Hassell, A. Boyle, R. Jessop & J. Fox. 2013. New insights from geolocators deployed on waders in Australia. Wader Study Group Bulletin 120: 37-46.

145 Mizutani, A., K. Kato, K. Tanaka, T. Ichikawa, Z. Mawek & A. Ilias. 2006. A report of the wintering waterbirds status along the west coast of Sarawak. Results of Asian Waterbird Census 2006. Sarawak Forestry, Kuching, Sarawak. 122 pp.

146 Moores, N. 1999. A survey of the distribution and abundance of shorebirds in South Korea during 1998–1999: interim summary. Stilt 34: 18-29.

147 Moores, N. & P.B.H. Nguyen. 2001. Vietnam Mekong shorebird survey 2000. Report to Wetlands International - Oceania. Canberra, Australia.

148 Moores, N. 2006. South Korea's shorebirds: a review of abundance, distribution, threats and conservation status. Stilt 50: 62-72.

149 Moores, N., D. Rogers, R.-H. Kim, C. Hassell, K. Gosbell, S.-A. Kim & M.-N. Park. 2008. The 2006–2008 Saemangeum Shorebird Monitoring Program Report. Birds Korea, Busan.

150 Moores, N. 2012. The distribution, abundance and conservation of avian biodiversity in Yellow Sea habitats in the Republic of Korea. PhD thesis, University of Newcastle, Australia.

151 Mundkur, T. 1993. A status overview of shorebirds in the East Asia-Australasian Flyway. Report to Australian National Parks and Wildlife Service, No. 2; Asian Wetland Bureau East Asia Flyway Coordination Project. University of Malaysia, Kuala Lumpur, Malaysia.

152 Myanmar Bird and Nature Society. 2006. Unpubl. data.

153 Nebel, S. 2007. Differential migration of shorebirds in the East Asian-Australasian flyway. Emu 107: 14-18.

154 Nechaev, V. 1998. Distribution of waders during migration at Sakhalin Island. *In:* Migration and International Conservation of Waders: Research and Conservation on North Asian, African, and European Flyways (H. Hötker, E. Lebedeva, P.S. Tomkovich, J.Gromadzka, N.C. Davidson, J. Evans, D.A. Stroud & R.B. West, Eds.). International Wader Studies 10: 225-232. International Wader Study Group.

155 Nechaev, V.A. & P.S. Tomkovich. 1987. A new subspecies of the Dunlin, *Calidris alpina litoralis* ssp. n. (Charadriidae, Aves), from the Sakhalin Island. Zoologicheskii Zhurnal 66: 1110-1113.

156 Nechaev, V.A. 2006. The migration of the Curlew Sandpiper *Calidris ferruginea* in the Russian Far East. *In:* The Annual Cycle of the Curlew Sandpiper *Calidris ferruginea* (L.G. Underhill, P.S. Tomkovich & J.A. Harrison, Eds.). International Wader Studies 19: 31-35. International Wader Study Group.

157 Newman, O.M.G., R.M. Patterson & W.C. Wakefield. 1984. Flinders Island – an update of the status of its avifauna. Tasmanian Bird Report 13: 3-14.

158 Nguyen, D.T., M.H. Le, T.H. Le, Q.H. Ha, Q.B. Nguyen & R. Thomas. 2006. Conservation of key coastal wetland sites in the Red River Delta: an assessment of IBAs 10 years on. BirdLife International Vietnam Programme, Hanoi. 58 pp.

159 Ornithological Society of New Zealand. 2013. Unpubl. data.

160 Ornithological Society of New Zealand. 2014. Bird records database.

161 Park, J.-Y. 1999. Wader counts in Korea. Tattler 21: 7.

162 Pedersen, A., S.S. Neilsen, L.D. Thut & L.T. Trai. 1996. Northward migration of shorebirds through the Red River Delta, Vietnam in 1994. Stilt 28: 22-31.

163 Pedersen, A. & N.H. Thang. 1996. The conservation of key coastal wetland sites in the Red River Delta. BirdLife International Vietnam Programme, Hanoi.

164 Piersma, T. 1985. Abundance of Waders in the Nakdong Estuary, South Korea, in September 1984. Wader Study Group Bulletin 44: 21-26.

165 Piersma, T., J. van Gils & P. Wiersma. 1996. Family Scolopacidae (Sandpipers, Snipes and Phalaropes). Pages 444-533 *in:* Handbook of the Birds of the World, Vol. 3. Hoatzin to Auks (J. del Hoyo, A. Elliot & J. Sargatal, Eds.). Lynx Edicions, Barcelona.

166 Piersma, T. & P. Wiersma. 1996. Family Charadriidae (Plovers). Pages 384-443 *in:* Handbook of the Birds of the World, Vol. 3. Hoatzin to Auks (J. del Hoyo, A. Elliot & J. Sargatal, Eds.). Lynx Edicions, Barcelona.

167 Piersma, T., T. Lok, Y. Chen, C.J. Hassell, H.-Y. Yang, A. Boyle, M. Slaymaker, Y.-C. Chan, D.S. Melville, Z.-W. Zhang & Z. Ma. *In prep*. Simultaneous declines in summer survival of three shorebird species signals a flyway at risk.

168 Pronkevich, V. 1998. Migration of waders in the Khabarovsk region of the Far East. *In:* Migration and International Conservation of Waders: Research and Conservation on North Asian, African, and European Flyways (H. Hötker, E. Lebedeva, P.S. Tomkovich, J.Gromadzka, N.C. Davidson, J. Evans, D.A. Stroud & R.B. West, Eds.). International Wader Studies 10: 425-430. International Wader Study Group.

169 Rheindt, F.E., T. Székely, S.V. Edwards, P.L. Lee, T. Burke, P.R. Kennerley, D.N. Bakewell, M. Alrashidi, A. Kosztolányi, M.A. Weston, W.-T. Liu, W.-P. Lei, Y. Shigeta, S. Javed, S. Zefania & C. Küpper. 2011. Conflict between genetic and phenotypic differentiation: the evolutionary history of a 'lost and rediscovered'shorebird. PLoS ONE 6: e26995.

170 Riegen, A., G. Vaughan, K. Woodley, B. Postill, G. Zhang, T. Wang & D. Sun. 2006. The fourth full shorebird survey of Yalu Jiang National Nature Reserve, 13–23 April 2006. Stilt 50: 47-53.

171 Riegen, A., D. Lawrie, T. Habraken, R.T. Gun & C.J. Hyok. 2009. Report of the first shorebird survey at Mundok, North Korea by Miranda Naturalists' Trust and Korean Natural Environment Conservation Fund, 26–29 April 2009. Stilt 56: 32-36.

172 Robertson, H.A., J.E. Dowding, G.P. Elliot, R.A. Hitchmough, C.M. Miskelly, C.F.J. O'Donnell, R.G. Powlesland, P.M. Sagar, R.P. Scofield & G.A. Taylor. 2013. Conservation Status of New Zealand Birds, 2012. New Zealand Threat Classification Series, Vol. 4. New Zealand Department of Conservation.

173 Rogers, D., P. Battley, M. Russell & A. Boyle. 2000. A high count of Asian Dowitchers in Roebuck Bay, North-Western Australia. Stilt 37: 10-12.

174 Rogers, D. 2013. How did the destruction of the Saemangeum tidal flats affect the Great Knot? Presentation at 2013 Australasian Ornithological Congress, December 2013. Auckland, New Zealand.

175 Rogers, D.I., N. Moores & P.F. Battley. 2006. Northwards migration of shorebirds through Saemangeum, the Geum Estuary and Gomso Bay, South Korea in 2006. Stilt 50: 73-89.

176 Rogers, D.I., H.-Y. Yang, C.J. Hassell, A.N. Boyle, K.G. Rogers, B. Chen, Z.-W. Zhang & T. Piersma. 2010. Red Knots (*Calidris canutus piersmai* and *C. c. rogersi*) depend on a small threatened staging area in Bohai Bay, China. Emu 110: 307-315.

177 Rogers, D.I., C.J. Hassell, A. Boyle, K. Gosbell, C. Minton, K.G. Rogers & R.H. Clarke. 2011. Shorebirds of the Kimberley Coast – Populations, key sites, trends and threats. Journal of the Royal Society of Western Australia 94: 377-391.

178 Rogers, K.G. & K. Gosbell. 2006. Demographic models for red-necked stint and curlew sandpiper in Victoria. Stilt 50: 203-214.

179 Round, P.D. 2006. Shorebirds in the Inner Gulf of Thailand. Stilt 50: 96-102.

180 Round, P.D. 2014. Personal records.

181 Sacher, T. & J.-O. Kriegs. 1999. China Trip Report 1999.

182 Sagar, P., U. Shankar & S. Brown. 1999. Distribution and numbers of waders in New Zealand, 1983–1994. Notornis 46: 1-44.

183 Saunders, D.A. & C.P. de Rebeira. 1986. Seasonal occurrence of members of the sub-order Charadrii (Waders and Shorebirds) on Rottnest Island, Western Australia. Australian Wildlife Research 13: 225-244.

184 Scott, D.A. 1989. A Directory of Asian Wetlands. International Union for the Conservation of Nature, Gland, Switzerland & Cambridge, UK. 1181 pp.

185 Sebastian, A.C., R.N. Hughes & P.J. Hurrell. 1993. Integrating Ash Pond Management with Shorebird Conservation, Tourism & Education at Stesen Janaletrik Sultan Salahuddin Abdul Aziz, Kapar, Selangor Darul Ehsan, Malaysia. National Electricity Board & Asian Wetland Bureau, Kuala Lumpur.

186 Silvius, M. & A.W. Taufik. 1989. Conservation and Land Use of Pulau Kimaam, Irian Jaya. PHPA/Asian Wetlands Bureau/Interwader, Bogor, Indonesia.

187 Singor, M.J.C. 1997. Waders of the Creery Wetlands and adjacent mudflats, Western Australia. Stilt 30: 39-48.

188 Smith, P. 1990. The biology and management of Waders (Suborder Charadrii) in New South Wales. Species Management Report no. 9, New South Wales National Parks and Wildlife Service, Hurstville, Australia.

189 South Korea Ministry of Environment. 2012. 2012 Winter Waterbird Census. Ministry of Environment & the National Environment Scientific Institute (in Korean).

190 Southey, I. 2009. Numbers of Waders in New Zealand 1994–2003. Research & Development Series No. 308. New Zealand Department of Conservation.

191 Spoon-billed Sandpiper Task Force. 2013. Records database.

192 Sripanomyom, S., P.D. Round, T. Savini, Y. Trisurat & G.A. Gale. 2011. Traditional salt-pans hold major concentrations of overwintering shorebirds in Southeast Asia. Biological Conservation 144: 526-537.

193 Swann, G. 2005. Ornithological Report, Ashmore Reef 23 January to 5 February 2005. Kimberley Birdwatching, Broome.

194 Swinhoe, R. 1871. A revised catalogue of the birds of China and its islands: with descriptions of new species, references to former notes, and occasional remarks. Proceedings of the Zoological Society of London (1871): 337-423.

195 Tang, S.X. & T.H. Wang. 1991. A survey of hunting pressure on waterbirds near Shanghai, March–May 1991. East China Waterbird Studies Group, Shanghai.

196 Thompson, P.M., W.G. Harvey, D.L. Johnson, D.J. Millin, S.M.A. Rashid, D.A. Scott, C. Stanford & J.D. Woolner. 1993. Recent notable bird records from Bangladesh. Forktail 9: 12-44.

197 Tiunov, I.M. & A.Y. Blokhin. 2010. Odoptu Gulf (Northern Sakhalin) Russia—Important site for migratory waders of EAA Flyway. Stilt 57: 59-62.

198 Tomkovich, P.S. 1998. Breeding schedule and primary moult in Dunlins of the Far East. Wader Study Group Bulletin 85: 29-34.

199 Tomkovich, P.S. 2010. Assessment of the Anadyr Lowland subspecies of bar-tailed godwit *Limosa lapponica anadyrensis*. Bulletin of the British Ornithologists Club 130: 88-95.

200 Tomkovich, P.S., R.R. Porter, E.Y. Loktionov & L.J. Niles. 2013. Pathways and staging areas of Red Knots *Calidris canutus rogersi* breeding in southern Chukotka, Far Eastern Russia. Wader Study Group Bulletin 120: 181-193.

201 Tomkovich, P.S., A.G. Dondua & D.S. Melville. *In prep*. Observation on the East Asian-Australasian Flyway of a Grey Plover *Pluvialis squatarola* originating from Wrangel Island.

202 Verheugt, W., F. Danielsen, H. Skov, A. Purwoko, R. Kadarisman & U. Suwarman. 1990. Seasonal variations in the wader populations of the Banyuasin Delta, South Sumatra, Indonesia. Wader Study Group Bulletin 58: 28-35.

203 Waki, Y. 1999. Kyushu South-west Archipelago Wetlands Report. Japan Wetlands Action Network.

204 Wang, H. 1997. Shorebird use of Yancheng Biosphere, China. *In:* Shorebird conservation in the Asia-Pacific Region. Proceedings of a symposium held in Brisbane, Australia, 16-17 March 1996 (P. Straw, Ed.). Australasian Wader Studies Group, Melbourne, Australia.

205 Wang, H. & M. Barter. 1998. Estimates of the numbers of waders in the Dongsha Islands, China. Stilt 33: 41-42.

206 Wang, T. Pers. comm. to D.S. Melville.

207 Wang, T. & H. Samson. 2000. Waterbird survey of Dalaihu National Nature Reserve, Inner Mongolia, China. Pages 96-113 *in:* Shorebird surveys and training in China (2000) (K. Chen, Z. Li, M. Barter & D. Watkins, Eds.). Wetlands International - China, Beijing.

208 Wang, T.H., T. S.X. & J.S. Ma. 1991. Survey of shorebirds and coastal wetlands in the Yellow River Delta, Shandong Province, Autumn 1991. East China Waterbird Ecology Group, East China Normal University, Shanghai.

209 Wang, T.H., S.X. Tang, D.J. Sai & R.S. Fu. 1992. A survey of coastal wetlands in the Yellow River Delta, Shandong Province, spring 1992. East China Waterbird Ecology Group, East China Normal University, Shanghai.

210 Watkins, D., R. Jaensch, D. Rogers & K. Gosbell. 2012. Unpubl. table of preliminary updated estimates of population size of selected shorebird species in the East Asian-Australasian Flyway based on trends in The Action Plan for Australian Birds 2010 (Garnett *et al.* 2011).

211 Wells, D.R. 2009. The Birds of the Thai-Malay Peninsula, Vol. 1: Non-passerines. Academic Press, London.

212 Wetlands International - Oceania. 2000. Shorebird survey of the Kikori Delta, 20 March 2000.

213 Wetlands International. 1996. Cambodia wetlands ornithological survey, April 1996. University of Malaysia, Kuala Lumpur, Malaysia.

214 Wetlands International. 2002. Asian Waterfowl Census database. Kuala Lumpur, Malaysia.

215 Wetlands International. 2013. Waterbird Population Estimates - Fifth Edition. Accessed 9 May 2013 at: http://wpe.wetlands.org/

216 Wetlands International & BirdLife International. 2013. Data sheets summary for the Assessment of EAAFP Flyway Site Network sites (incomplete).

217 Wilson, H.B., B.E. Kendall, R.A. Fuller, D.A. Milton & H.P. Possingham. 2011. Analyzing variability and the rate of decline of migratory shorebirds in Moreton Bay, Australia. Conservation Biology 25: 758-766.

218 Wilson, J. & C. Hassell. 1998. Wader counts on the Lacepede Islands, Western Australia. Stilt 33: 49-50.

219 Wilson, J.R. 2000. South Australia wader surveys, January and February 2000. Australasian Wader Studies Group, Melbourne, Australia.

220 Wilson, J.R. 2001. Victorian wader surveys, January and February 2001. Australian Wader Studies Group Report, Melbourne, Australia.

221 World Wide Fund Hong Kong. 2009. Situational Analysis of Waterbirds in the East Asia-Australasian Flyway. World Wide Fund for Nature, Hong Kong.

222 World Wide Fund Japan. 2002. The interim report of the shorebird census in Japan (spring 2002). World Wide Fund for Nature, Tokyo, Japan.

223 World Wide Fund Japan. 2002. Unpubl. shorebird count data.

224 World Wide Fund Japan. 2002. The report of the shorebird population changes monitoring census in Japan (2001). World Wide Fund for Nature, Tokyo, Japan.

225 Yang, H.-Y., B. Chen, M. Barter, T. Piersma, C.-F. Zhou, F.-S. Li & Z.-W. Zhang. 2011. Impacts of tidal land reclamation in Bohai Bay, China: ongoing losses of critical Yellow Sea waterbird staging and wintering sites. Bird Conservation International 21: 241-259.

226 Yang, H.-Y., B. Chen, Z.-j. Ma, N. Hua, J.A. van Gils, Z.-W. Zhang & T. Piersma. 2013. Economic design in a long-distance migrating molluscivore: how fast-fuelling red knots in Bohai Bay, China, get away with small gizzards. Journal of Experimental Biology 216: 3627-3636.

227 Yang, H.-Y. & T. Piersma. 2014. Pers. comm.

228 Yeap, C.A., A.C. Sebastian & G.W.H. Davison. 2007. Directory of Important Bird Areas in Malaysia. Key Sites for Conservation. Malaysian Nature Society. 330 pp.

229 Yi, J.Y. & J.H. Kim. 2003. The current status of shorebirds in South Korea and identification of internationally important sites. Unpubl. report to Environment Australia, Canberra, Australia.

230 Zhu, S.Y., Z.W. Li, J.Z. Lu, K. Shan & M.A. Barter. 2001. Northward migration of shorebirds through the Huang He Delta, Shandong Province, in the 1997–1999 period. Stilt 38: 33-38.

231 Zöckler, C., E.E. Syroechkovskiy & G. Bunting. 2010. International Single Species Action Plan for the Conservation of the Spoon-billed Sandpiper (*Eurynorhynchus pygmeus*), Technical Report Series 23. BirdLife International Asia Division, Tokyo; CMS Secretariat, Bonn.

232 Zöckler, C. 2012. Unpubl. waterbird counts from Gulf of Martaban, Myanmar, winter 2008–12.

© Menxiu Tong. *Mixed flock at Rudong Mudflats, Jiangsu (Site #124)*

SUMMARY OF THE FIVE CRITERIA (A-E) USED TO EVALUATE IF A TAXON BELONGS IN AN IUCN RED LIST THREATENED CATEGORY (CRITICALLY ENDANGERED, ENDANGERED OR VULNERABLE).[1]

A. Population size reduction. Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

	Critically Endangered	Endangered	Vulnerable
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3 & A4	≥ 80%	≥ 50%	≥ 30%

A1 Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased.

A2 Population reduction observed, estimated, inferred, or suspected in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction projected, inferred or suspected to be met in the future (up to a maximum of 100 years) *[(a) cannot be used for A3].*

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

based on any of the following:

(a) direct observation *[except A3]*

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality

(d) actual or potential levels of exploitation

(e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.

B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)

	Critically Endangered	Endangered	Vulnerable
B1. Extent of occurrence (EOO)	< 100 km²	< 5,000 km²	< 20,000 km²
B2. Area of occupancy (AOO)	< 10 km²	< 500 km²	< 2,000 km²
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented **OR** Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline observed, estimated, inferred or projected in any of: **(i)** extent of occurrence; **(ii)** area of occupancy; **(iii)** area, extent and/or quality of habitat; **(iv)** number of locations or subpopulations; **(v)** number of mature individuals			
(c) Extreme fluctuations in any of: **(i)** extent of occurrence; **(ii)** area of occupancy; **(iii)** number of locations or subpopulations; **(iv)** number of mature individuals			

C. Small population size and decline		Critically Endangered	Endangered	Vulnerable
Number of mature individuals		< 250	< 2,500	< 10,000
AND at least one of C1 or C2				
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future):		25% in 3 years or 1 generation (whichever is longer)	20% in 5 years or 2 generations (whichever is longer)	10% in 10 years or 3 generations (whichever is longer)
C2. An observed, estimated, projected or inferred continuing decline AND at least 1 of the following 3 conditions:				
(a)	(i) Number of mature individuals in each subpopulation	≤ 50	≤ 250	≤ 1,000
	(ii) % of mature individuals in one subpopulation =	90–100%	95–100%	100%
(b) Extreme fluctuations in the number of mature individuals				

D. Very small or restricted population	Critically Endangered	Endangered	Vulnerable
D. Number of mature individuals	< 50	< 250	D1. < 1,000
D2. *Only applies to the VU category* Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time.	-	-	D2. typically: AOO < 20 km² or number of locations ≤ 5

E. Quantitative Analysis	Critically Endangered	Endangered	Vulnerable
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

1 Use of this summary sheet requires full understanding of the *IUCN Red List Categories and Criteria* and *Guidelines for Using the IUCN Red List Categories and Criteria*. Please refer to both documents for explanations of terms and concepts used here.

Appendix B *Important sites for EAAF priority shorebird populations.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
1	Australia	Adelaide River Floodplain	Northern Territory	-12.24999	131.26666
2	Australia	Adele Island	Western Australia	-15.52757	123.15743
3	Australia	Albany Harbours	Western Australia South West	-35.05000	117.88333
4	Australia	Anson Bay, South	Northern Territory	-13.52000	129.97000
5	Australia	Ashmore Reef	Western Australia North	-12.23333	123.08334
6	Australia	Barrow Island	Western Australia North	-20.75000	115.38889
7	Australia	Blue Mud Bay	Northern Territory	-13.31010	136.15700
8	Australia	Boucat Bay	Northern Territory	-12.01667	134.50000
9	Australia	Boullanger Bay/Robbins Passage	Tasmania	-40.75000	144.86667
10	Australia	Buckingham Bay	Northern Territory	-12.20580	135.67500
11	Australia	Burdekin River Delta	Queensland East	-19.66667	147.55000
12	Australia	Bynoe Harbour	Northern Territory	-12.66667	130.55000
13	Australia	Cairns Foreshore	Queensland East	-16.91667	145.76667
14	Australia	Cape Bowling Green	Queensland East	-19.30000	147.38333
15	Australia	Carpenter Rocks, Pelican Point	South Australia	-37.93180	140.41900
16	Australia	Ceduna Bays	South Australia	-32.28320	133.68300
17	Australia	Chambers Bay	Northern Territory	-12.26430	131.63200
18	Australia	Corner Inlet	Victoria	-38.73333	146.21667
19	Australia	Dampier Saltworks	Western Australia North	-20.73333	116.73333
20	Australia	Eighty Mile Beach	Western Australia North	-19.23333	121.41667
21	Australia	Elcho Island	Northern Territory	-11.84380	135.88000
22	Australia	Fog Bay	Northern Territory	-12.87360	130.31900
23	Australia	Forrestdale Lake Nature Reserve	Western Australia South West	-32.15850	115.93600
24	Australia	Great Sandy Strait	Queensland South East	-25.66667	152.93333
25	Australia	Hunter Estuary	New South Wales Coastal	-32.84000	151.78333
26	Australia	Islands off False Orford Ness	Queensland North	-11.30000	143.00000
27	Australia	Kangaroo Island	South Australia	-35.71000	137.62000
28	Australia	King Island	Tasmania	-39.86667	143.91667
29	Australia	Lacepede Islands	Western Australia North	-16.85000	122.10000
30	Australia	Lake Connewarre Area	Victoria	-38.28330	144.46670
31	Australia	Lake Cooloongup	Western Australia South West	-32.29000	115.79000
32	Australia	Lake George	South Australia	-37.40000	140.00000
33	Australia	Lake MacLeod	Western Australia Mid	-24.05000	113.59000
34	Australia	Lake Martin	Victoria	-38.06667	143.56667
35	Australia	Lake Murdeduke	Victoria	-38.18333	143.90000
36	Australia	Limmen River Mouth	Northern Territory	-15.10720	135.71100
37	Australia	Logan Lagoon, Flinders Island	Tasmania	-40.16667	148.28333
38	Australia	Low Island, Arnhem Bay	Northern Territory	-12.32000	136.16660
39	Australia	Milingimbi Coast	Northern Territory	-12.00000	135.00000
40	Australia	Moreton Bay	Queensland South East	-27.25000	153.33333

Table continues

Appendix B *Important sites for EAAF priority shorebird populations, continued.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
41	Australia	Notch Point	Queensland East	-21.73333	149.46667
42	Australia	Nungbalgarri Creek	Northern Territory	-11.93333	134.06660
43	Australia	Ocean Grove to Barwon Heads	Victoria	-38.27450	144.50500
44	Australia	Orielton Lagoon	Western Australia North	-42.78333	147.50000
45	Australia	Peel-Harvey System	Western Australia South West	-32.58333	115.73333
46	Australia	Pelican Island (incl. nearby islands)	Queensland North	-13.91667	143.83333
47	Australia	Pioneer River – McEwan's Beach	Queensland East	-21.20000	149.20000
48	Australia	Port Hedland Saltworks	Western Australia North	-20.23960	118.93900
49	Australia	Port MacDonnell Coast	South Australia	-38.05330	140.70300
50	Australia	Port McArthur	Northern Territory	-15.78100	136.66700
51	Australia	Port Pirie Coast	South Australia	-33.26170	137.80400
52	Australia	Port Stephens	New South Wales Coastal	-32.70000	152.10000
53	Australia	Rivoli Bay	South Australia	-37.55000	140.10000
54	Australia	Roebuck Bay	Western Australia North	-18.07000	122.33333
55	Australia	Roper River Area	Northern Territory	-14.71667	135.41667
56	Australia	Rottnest Island	Western Australia South West	-32.00000	115.51667
57	Australia	SE Gulf of Carpentaria	Queensland West	-17.47000	140.76000
58	Australia	Shallow Inlet/Sandy Point	Victoria	-38.80000	146.15000
59	Australia	Shoal Bay: Tree Pt to Lee Pt (Hope Inlet)	Northern Territory	-12.33200	131.00000
60	Australia	Shoalwater Bay & Broad Sound	Queensland East	-22.12000	150.04000
61	Australia	The Coorong & Coorong National Park	South Australia	-35.74000	139.22000
62	Australia	Thomsons Lake Nature Reserve	Western Australia South West	-32.15000	115.83333
63	Australia	Vasse Wonnerup Estuary	Western Australia South West	-33.62600	115.42400
64	Australia	Western Port	Victoria	-38.41667	145.33333
65	Australia	Western Port Phillip Bay	Victoria	-38.00240	144.59700
66	Bangladesh	Ganges-Brahmaputra-Meghna Delta	Barisal Division	22.30000	91.16667
67	Bangladesh	Hakaluki Haors	Sylhet Division	24.66667	92.08333
68	Bangladesh	Hasher Char	Chittagong Division	21.60000	91.85000
69	Bangladesh	Sonadia & Moheskhali Island	Chittagong Division	21.50000	91.86667
70	Bangladesh	Teknaf Coast	Chittagong Division	20.75020	92.33290
71	Cambodia	Koh Kong (Kaoh Kapik)	Koh Kong	11.50000	103.00000
72	China	Anqingyanjiang Nature Reserve: Caizi Hu	Anhui	30.78518	117.09613
73	China	Anqingyanjiang Nature Reserve: Wuchang Hu	Anhui	30.28333	116.70000
74	China	Liuhewei	Guangdong	23.47073	116.88486
75	China	Guangxi Beilun Estuary National Nature Reserve	Guangxi	21.52989	108.19006
76	China	Changhua Coastal Industrial Park	Taiwan	24.06778	120.38333
77	China	Changhua River	Hainan	19.25570	108.73777
78	China	Changhua River Estuary, Chuanghuazhen	Hainan	19.30040	108.63910
79	China	Chee Lake, Kinmen	Taiwan	24.46896	118.30675
80	China	Kinmen Island	Taiwan	24.50000	118.50000

Table continues

Appendix B *Important sites for EAAF priority shorebird populations, continued.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
81	China	Chongming Dongtan National Nature Reserve	Shanghai Municipality	31.51111	121.96203
82	China	Dalai Hu National Nature Reserve	Nei Mongol	48.90000	117.40000
83	China	Dandong Port East	Liaoning	39.85000	124.18333
84	China	Deep Bay (incl. Mai Po & Futian)	Hong Kong, Shenzen	22.50701	113.99651
85	China	Yalujiang National Nature Reserve, Liaoning	Jiangsu	39.83167	123.84496
86	China	Dongtai (Dau Long Gang – Zhou Gang)	Jiangsu	33.27524	120.77918
87	China	Dongsha Shoals	Jiangsu	32.75732	121.04785
88	China	Dongtai (Zhou Gang - Qiang Gang Coast)	Jiangsu	32.75645	120.90060
89	China	East Dongting Lake Nature Reserve	Hunan	29.25000	112.91670
90	China	Erdao Saltworks, Yinghekou	Liaoning	40.55344	122.28781
91	China	Luannan Coast & Saltworks	Hebei	39.08721	118.21707
92	China	Fucheng, Zhangjiang	Guangdong	20.89382	110.17629
93	China	Ganyu Coast	Jiangsu	34.94700	119.21012
94	China	Guandong Haifeng Wetlands	Guangdong	22.86667	115.31667
95	China	Haicang Coast, Xiamen	Fujian	24.55260	118.02178
96	China	Tongzhou-Haimen coast (Xinzhong Port)	Fujian	32.18354	121.45678
97	China	Hangzhou Wan	Zhejiang	30.30000	121.00000
98	China	Han-Pao, Changhua	Taiwan	24.05000	120.36667
99	China	Huang He Delta Nature Reserve	Shandong	37.69138	119.18083
100	China	Huanghua Coast (Cangzhou)	Hebei	38.46225	117.63560
101	China	Jiazhou Wan	Shandong	36.18333	120.16667
102	China	Jinwan Mangrove, Beihai	Guangxi	21.42077	109.22707
103	China	Jiu Duan Sha National Nature Reserve	Shanghai Municipality	31.21201	121.92785
104	China	Jujiang Saltpan	Fujian	24.58799	118.37002
105	China	Laizhou Wan	Shandong	37.16667	119.25000
106	China	Lan-Yang-Hsi (Lanyang Estuary)	Taiwan	24.71667	121.81667
107	China	Leizhou, Zhangjiang	Guangdong	20.84694	110.20701
108	China	Laoting (Daqinghe - Shijiutuo)	Hebei	39.15307	118.79055
109	China	Lianyungang Coast	Jiangsu	34.67112	119.44478
110	China	Laobian - Yingkou coast, Liaoning	Liaoning	40.64404	122.13918
111	China	Linghekou, Jin, Liaoning	Liaoning	40.89077	121.30237
112	China	Meilisha Reclamation Pools, Haikou	Hainan	20.06559	110.30293
113	China	Meizhou Wan	Fujian	25.25000	118.98333
114	China	Minjiang Estuary	Fujian	26.03134	119.63889
115	China	Qianbancun	Fujian	24.58444	118.35750
116	China	Nanhui Coast	Shanghai Municipality	31.00438	121.93420
117	China	Nantong Coast	Jiangsu	32.43478	121.29331
118	China	Poyang Lake (and nearby wetlands)	Jiangxi	29.08330	116.28330
119	China	Qidong County North Coast	Jiangsu	32.01226	121.77668
120	China	Qidong County South Coast	Jiangsu	31.77937	121.90966

Table continues

Appendix B *Important sites for EAAF priority shorebird populations, continued.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
121	China	Qinglangang Nature Reserve	Hainan	19.70000	110.84167
122	China	Qinhuangdao	Hebei	39.84618	119.51908
123	China	Quanzhou Wan	Fujian	24.83333	118.66667
124	China	Rudong Mudflats	Jiangsu	32.38421	121.40484
125	China	San Jia Gang (Pudong)	Shanghai Minicipality	31.22025	121.76580
126	China	Sanmen Wan	Zhejiang	29.16667	121.58334
127	China	Shantou (Nangankou)	Guangdong	23.36667	116.80000
128	China	Shengjin Lake Nature Reserve	Anhui.	30.37821	117.02571
129	China	Sheyang Saltworks, Jiangsu	Jiangsu	33.71658	120.49043
130	China	Shuangtaizihekou National Nature Reserve	Liaoning	40.95216	121.83777
131	China	Sigeng Nature Reserve	Hainan	19.20000	108.63333
132	China	Sihcao Wetlands	Taiwan	23.02000	120.13000
133	China	Wudi-Zhanhua-Hekou Coast, Shandong	Shandong	38.13334	118.20000
134	China	Szu-Tsao Wildlife Reserve	Tainan, Taiwan	23.05000	120.15000
135	China	Chiku, Tainan	Taiwan	23.16667	120.11667
136	China	Tianjin Coast	Tianjin Municipality	38.95862	117.81385
137	China	Ta-Tu-His, Changhua	Taiwan	24.20000	120.46667
138	China	Tseng-Wen-Chi (River)	Tainan	23.08333	120.08333
139	China	Wenzhou Wan	Zhejiang	27.73333	120.75000
140	China	Wujiang River Wetland, Kinmen	Taiwan	24.42890	118.31403
141	China	Xiamen Coast (incl. Aotou & Fenglin)	Fujian	24.50000	118.15000
142	China	Xinghua Wan	Fujian	25.40000	119.23333
143	China	Pulandian – Jinzhou East Coast, Liaoning	Liaoning	39.31844	122.25325
144	China	Xinyingzhen	Hainan	19.73256	109.28572
145	China	Xitou	Guangdong	21.60000	111.78333
146	China	Xucuogang Wetland	Taiwan	25.08659	121.17040
147	China	Yancheng Nature Reserve	Jiangsu	33.48333	120.66667
148	China	Yinggehai Saltpan	Hainan	18.52700	108.73902
149	China	Yueqing Wan & Xuanmen Wan	Zhejiang	28.15000	121.06667
150	China	Yujiang Village, Xiangli Town	Guangxi	21.57954	109.13494
151	China	Zhuanghe Wan	Liaoning	39.60152	122.96967
152	China	Zhuanghe East Coast	Liaoning	39.69134	123.21602
153	China	Zhuanghe West Coast	Liaoning	39.54248	122.75255
154	Indonesia	Banyuasin Delta	South Sumatra	-1.91700	104.63300
155	Indonesia	Benoa Bay	Bali	-8.75000	115.20000
156	Indonesia	Kuala Tungal – Tanjung Djabung Coast	Jambi	-1.00000	103.75000
157	Indonesia	Pesisir Timur Pantai Sumatera Utara	North Sumatra	3.46667	99.26667
158	Indonesia	Pulau Komolom	Papua	-8.30000	138.75000
159	Indonesia	Sekopong Bay	Lampung	-4.93333	105.91667
160	Indonesia	Sungai Cemara Beach	Jambi	-1.43333	104.45000

Table continues

Appendix B *Important sites for EAAF priority shorebird populations, continued.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
161	Indonesia	Ujung Pangkah	Java East	-6.88333	112.60000
162	Indonesia	Wasur National Park	Papua	-8.74719	140.58100
163	Japan	Amamioshima Oose-kaigan	Kakeroma-jima	28.45230	129.71660
164	Japan	Anogawa & Shitomogawa Estuaries, Toyotsuura	Saga	33.08350	130.41650
165	Japan	Arao Kaigan	Kumamoto	32.95750	130.43080
166	Japan	Awase Higata	Okinawa	26.30000	127.81667
167	Japan	Banzu	Chiba	35.42000	139.91667
168	Japan	Chidorihama, Kiya-gawa Kako	Okayama	34.53000	133.73000
169	Japan	Chiri-hama	Ishikawa	36.88330	136.75830
170	Japan	Daijugarami	Saga	33.16667	130.26667
171	Japan	Daimyoujin-gawa Kakou	Ehime	33.95000	133.08333
172	Japan	Fujimae Higata	Aichi	35.08333	136.83333
173	Japan	Fukiagehama Kaigan	Kagoshima	31.49790	130.31140
174	Japan	Furen-ko	Hokkaido	43.28170	145.39170
175	Japan	Futtsu	Chiba	35.25000	139.86000
176	Japan	Gushi Higata	Okinawa	26.17820	127.64960
177	Japan	Hakata-wan Tobu (Wajiro, Tatara)	Fukuoka	33.66090	130.41110
178	Japan	Hasaki Shinko	Ibaraki	35.75350	140.83340
179	Japan	Hayatsue-gawa Kako (Kawasoe-machi)	Saga	33.15000	130.33000
180	Japan	Hikata Hachimangoku	Ibaraki	36.75000	140.68333
181	Japan	Hikawa Estuary, Shiranui	Kumamoto	32.61667	130.61667
182	Japan	Hitotsuba Irie	Miyazaki	31.92140	131.46380
183	Japan	Iioka Kaigan	Chiba	35.70000	140.72000
184	Japan	Ikawazu	Aichi	34.64830	137.14720
185	Japan	Imazu Higata	Fukuoka	33.60000	130.25000
186	Japan	Inba-numa, Inbanuma-Cyuuouhaisuiro	Chiba	35.78000	140.32000
187	Japan	Inner Tokyo Bay	Tokyo	35.60000	139.88333
188	Japan	Isahaya Higata	Nagasaki	32.87083	130.14157
189	Japan	Iwakuni-shi Ozu Hasuda	Yamaguchi	34.13460	132.21910
190	Japan	Izumi Kantaku	Kagoshima	32.08000	130.37000
191	Japan	Kagoshima-ken Beppu-gawa	Kagoshima	31.71920	130.64190
192	Japan	Kahokugata	Ishikawa	36.63333	136.66667
193	Japan	Kamisu-Chou Takahama	Ibaraki	35.86667	140.63333
194	Japan	Kamo-gawa Kako	Ehime	33.91667	133.16667
195	Japan	Kashima Shingomori Kaigan	Saga	33.10720	130.12720
196	Japan	Kashima-nada	Ibaraki	35.97080	140.67360
197	Japan	Kasumigaura Nangan Inashiki-shi Ukishima	Ibaraki	35.96110	140.43630
198	Japan	Kikuchi-gawa Kakou	Kumamoto	32.88000	130.53000
199	Japan	Kiritappu Shitsugen	Hokkaido	43.15760	145.18000
200	Japan	Komuke-ko	Hokkaido	44.26667	143.48333

Table continues

Appendix B *Important sites for EAAF priority shorebird populations, continued.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
201	Japan	Kujukuri Coast	Chiba	35.58333	140.51667
202	Japan	Kuma-gawa Kako	Kumamoto	32.46667	130.56667
203	Japan	Kumozugawa, Atagogawa & Kongogawa Estuaries	Mie	34.61667	136.55000
204	Japan	Man-ko	Okinawa	26.18333	127.68333
205	Japan	Matsugishi-higata	Chiba	35.73000	140.80000
206	Japan	Matsukawa-ura	Fukushima	37.81970	140.97990
207	Japan	Miyagawakakou, Sotoshirotagawakakou	Mie	34.50000	136.71667
208	Japan	Moriyamashi-kogan	Shiga	35.13330	135.91660
209	Japan	Mukawa Kako	Hokkaido	42.57000	141.93000
210	Japan	Nagasaki Kaigan	Chiba	35.70000	140.80000
211	Japan	Nakatsu Kaigan (Higashi-hama)	Oita	33.61530	131.21940
212	Japan	Nanko Yachoen	Osaka	34.63500	135.39970
213	Japan	Naruto-machi Suiden	Chiba	35.34000	140.28000
214	Japan	Natsui-gawa Kako	Fukushima	37.05690	140.97530
215	Japan	Notsuke-zaki, Odaito	Hokkaido	43.58000	145.30000
216	Japan	Obitsu-gawa Kakou	Chiba	35.33000	139.92000
217	Japan	Okina Higata	Okinawa	26.15000	127.66667
218	Japan	Omaezaki-kaigan	Shizuoka	34.60000	138.23333
219	Japan	Osaka Hokko Minami-chiku	Osaka	34.65040	135.38440
220	Japan	Rokkaku-gawa Kako (Ashikari-cho)	Saga	33.19920	130.22910
221	Japan	Saroma-ko	Hokkaido	44.13000	143.83000
222	Japan	Shigenobu-gawa Kako	Ehime	33.80280	132.70000
223	Japan	Shin-kawa Kako	Hokkaido	43.17660	141.24920
224	Japan	Shio-kawa Higata	Aichi	34.68333	137.30000
225	Japan	Shiraho, Miyara-wan	Ishigaki-shima	24.35000	124.21000
226	Japan	Shira-kawa Kako	Kumamoto	32.78110	130.60330
227	Japan	Sone Higata (Sone-Higata Tideland)	Fukuoka	33.81667	130.96667
228	Japan	Suzuka-gawa Kako, Suzuka-hasen Kako	Mie	34.93110	136.63970
229	Japan	Takamatsu, Kahoku Kaigan	Ishikawa	36.75000	136.70000
230	Japan	Takasegawa Kako-Mutsuogawarakou	Aomori	40.90780	141.38790
231	Japan	Ten-no Kaigan	Akita	39.90000	139.96000
232	Japan	Tochigi-ken Nanbu Suiden-chitai	Tochigi	36.32170	139.75220
233	Japan	Tofutsu-ko	Hokkaido	43.93333	144.41667
234	Japan	Toyama Shinko	Toyama	36.77430	137.13190
235	Japan	Umeda-gawa Kakou	Aichi	34.72000	137.35000
236	Japan	Usa Kaigan	Oita	33.57640	131.33940
237	Japan	Wajiro Higata	Fukuoka	33.68054	130.41979
238	Japan	Wakkanai-shi Koetoi	Hokkaido	45.40480	141.78410
239	Japan	Yahagi-gawa Kako Shuhen	Aichi	34.81667	136.98333
240	Japan	Yahagihuru-kawa Kako	Aichi	34.80000	137.20000

Table continues

Appendix B *Important sites for EAAF priority shorebird populations, continued.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
241	Japan	Yamaguti-wan	Yamaguchi	34.01980	131.38100
242	Japan	Yodaura Suiden	Chiba	35.91670	140.53330
243	Japan	Yonaha-wan	Miyako-jima	24.75000	125.27000
244	Japan	Yoshino-gawa Karyu-iki	Tokushima	34.09250	134.56120
245	Malaysia	Bako-Buntal Bay	Kuching, Sarawak	1.70000	110.35000
246	Malaysia	Baton, Belawai	Mukah, Sarawak	2.32300	111.18359
247	Malaysia	Kuala Sadong – Kuala Lupar	Samarahan, Sarawak.	1.53846	110.88191
248	Malaysia	Kuala Samarahan – Kuala Sadong	Samarahan, Sarawak.	1.58333	110.58333
249	Malaysia	Mersing Estuary/Mersing Bay	Johor, Peninsula Malaysia	1.93602	104.11209
250	Malaysia	North-central Selangor Coast	Selangor, Peninsula Malaysia	3.33333	101.25000
251	Malaysia	Pulau Bruit	Mukah, Sarawak	2.56559	111.34500
252	Malaysia	Sejinkat Ashponds	Kuching, Sarawak	1.63980	110.46750
253	Malaysia	Sungai Nibong, Pulau Pinang	Perak, Peninsula Malaysia	5.33658	100.29710
254	Malaysia	Tanjung Situngkat	Temburong, Sarawak	4.84882	115.02864
255	Malaysia	Tanjung Tokong Mudflats	Perak, Peninsula Malaysia	5.45304	100.31286
256	Malaysia	Teluk Air Tawar-Kuala Muda Coast	Perak, Peninsula Malaysia	5.51667	100.38333
257	Myanmar	Inner Gulf of Martaban	Yangon, Bago	16.72700	97.01000
258	Myanmar	Irrawaddy Delta	Ayeyarwady	16.11640	94.73680
259	Myanmar	Moyingyi Bird Sanctuary	Bago	17.50000	96.50000
260	New Zealand	Aotea Harbour	Waikato	-38.01667	174.83333
261	New Zealand	Avon-Heathcote Estuary	Canterbury	-43.54820	172.73290
262	New Zealand	East Waimea Inlet	Tasman	-41.33333	173.10000
263	New Zealand	Farewell Spit	Tasman	-40.50000	172.83333
264	New Zealand	Firth of Thames	Waikato	-37.15000	175.55000
265	New Zealand	Houhora Harbour	Northland	-34.83333	173.16667
266	New Zealand	Invercargill - Awarua Bay	Southland	-46.41667	168.36667
267	New Zealand	Kaipara Harbour	Auckland	-36.41667	174.25000
268	New Zealand	Kawhia Harbour	Waikato	-38.06667	174.81667
269	New Zealand	Manukau Harbour	Auckland	-36.96667	174.83333
270	New Zealand	Matarangi Spit - Whangapoa	Waikato	-36.70000	175.55000
271	New Zealand	Motueka Estuary	Tasman	-41.11666	173.00000
272	New Zealand	Ohope/Ohiwa Harbour	Bay of Plenty	-37.96667	177.03334
273	New Zealand	Parengarenga Harbour	Northland	-34.51600	172.95753
274	New Zealand	Rangaunu Harbour	Northland	-34.50000	173.16667
275	New Zealand	Tauranga Harbour	Bay of Plenty	-37.71667	176.14999
276	New Zealand	Waitemata Harbour	Auckland	-36.83333	174.66667
277	New Zealand	Westhaven (Whanganui) Inlet	Tasman	-40.57603	172.61610
278	New Zealand	Whangarei Harbour	Northland	-35.71667	174.31667
279	North Korea	Mundok Migratory Bird Wetland Reserve	South Pyongan	39.43700	125.33900
280	Papua New Guinea	Bensbach-Bula Coast	Western	-9.23550	141.14910

Table continues

Appendix B *Important sites for EAAF priority shorebird populations, continued.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
281	Papua New Guinea	Kikori Delta	Gulf	-7.65000	144.50000
282	Philippines	Cebu-Mactan	Cebu	10.33333	123.98333
283	Philippines	Manila Bay	Luzon	14.50000	120.75000
284	Philippines	Olango Island	Cebu	10.23333	124.03333
285	Russia	Anadyr Lowlands	Chukotka Autonomous Okrug	65.00000	178.50000
286	Russia	Babushkina Bay	Magadanskaya	59.19160	153.57400
287	Russia	Baikal Bay	Sakhalinskaya	53.56667	142.48334
288	Russia	Beringovsky Vicinity	Chukotka Autonomous Okrug	63.10000	179.17000
289	Russia	Bolshoe Lake & Bolshaya River Mouth	Kamchatka Krai	52.53333	156.28334
290	Russia	Kainupilgin Lagoon	Chukotka Autonomous Okrug	63.28000	178.51000
291	Russia	Khairyuzova Bay	Kamchatka Krai	57.08333	156.68333
292	Russia	Kharchinskoe Lake	Kamchatka Krai	56.53333	160.86667
293	Russia	Khatyrka	Chukotka Autonomous Okrug	62.07341	175.29983
294	Russia	Kronotsky Nature Reserve	Kamchatka Krai	54.56667	161.16667
295	Russia	Lake Evoron	Khabarovsk Krai	51.45651	136.49231
296	Russia	Lososei Bay	Sakhalinskaya	46.73333	142.68333
297	Russia	Malkachan River Mouth	Magadanskaya	59.86666	154.21666
298	Russia	Meinypil'gyno	Chukotka Autonomous Okrug	62.33000	177.20000
299	Russia	Moroshechnaya River Estuary	Kamchatka Krai	56.83333	156.16667
300	Russia	Nabilsky Bay	Sakhalinskaya	51.71667	143.31667
301	Russia	Odoptu Gulf	Sakhalinskaya	53.08333	143.25000
302	Russia	Opala River	Kamchatka Krai	51.91667	156.48334
303	Russia	Penzhina River Mouth	Kamchatka Krai	62.50130	165.18000
304	Russia	Russian Koshka Spit	Chukotka Autonomous Okrug	64.39000	178.51000
305	Russia	Schastiya Bay	Khabarovsk Krai	53.30700	141.16200
306	Russia	Skobeleva Bay	Kamchatka Krai	60.40000	166.33333
307	Russia	Tugurskiy Bay	Khabarovsk Krai	53.75000	136.78334
308	Russia	Vakhil River Mouth	Kamchatka Krai	53.24000	159.58000
309	Russia	Yugznaya Lagoon	Chukotka Autonomous Okrug	63.30000	178.96700
310	South Korea	Aphae Island	Jeollanam-do	34.83333	126.33334
311	South Korea	Asan Bay	Chungcheongnam-do	36.87750	126.84400
312	South Korea	Baenang-gimi Wetland	Jeollanam-do	34.68333	125.41667
313	South Korea	Cheonsu Bay	Chungcheongnam-do	36.62230	126.45840
314	South Korea	Daebu Island	Gyeonggi-do	37.25000	126.48333
315	South Korea	Dogu Beach	Gyeongsangbuk-do	35.98333	129.41667
316	South Korea	Dongjin River Estuary	Jeollabuk-do	35.81670	126.70000
317	South Korea	Ganghwa Tidal Flat	Incheon	37.58333	126.50000
318	South Korea	Geum River Estuary (incl. Yubu Island)	Chungcheongnam-do	35.99848	126.68581
319	South Korea	Gochang-gun	Jeollabuk-do	35.54000	126.57000
320	South Korea	Gomso Bay	Jeollabuk-do	35.58025	126.65072

Table continues

Appendix B *Important sites for EAAF priority shorebird populations, continued.*

Site	Country	Name	Province/State/Region	Latitude (decimal degrees)	Longitude (decimal degrees)
321	South Korea	Hado-ri	Jeju-do	33.51071	126.89946
322	South Korea	Haenam Hwangsan	Jeollanam-do	34.41667	126.50000
323	South Korea	Hampyong Bay	Jeollanam-do	35.11666	126.41666
324	South Korea	Han River Estuary	Gyeonggi-do	37.73333	126.66667
325	South Korea	Hungwun River	Jeollabuk-do	36.10000	127.00000
326	South Korea	Janghang Reservoir (Estuary)	Chungcheongnam-do	36.05000	126.80000
327	South Korea	Jondal-ri	Jeju-do	33.48315	126.90417
328	South Korea	Mangyung River Estuary	Jeollabuk-do	35.88333	126.73333
329	South Korea	Muan-gun Tidal Flat	Jeollanam-do	35.08333	126.33334
330	South Korea	Nakdong Estuary	Busan	35.13334	128.91667
331	South Korea	Namhae	Gyeongsangnam-do	34.83333	127.83334
332	South Korea	Namyang Bay	Gyeonggi-do	37.10441	126.71645
333	South Korea	Seosan	Chungcheongnam-do	36.76667	126.45000
334	South Korea	Songdo Tidal Flat	Gyeonggi-do	37.36788	126.68794
335	South Korea	Suncheon Bay	Jeollanam-do	34.83333	127.50000
336	South Korea	Wolgwang	Gyeongsangnam-do	35.73333	128.16667
337	South Korea	Yeongjong Island	Icheon	37.51667	126.53333
338	Thailand	Bo Muang/Tha Maprao	Krabi	7.68330	99.21670
339	Thailand	Inner Gulf of Thailand	Central	13.50580	100.52700
340	Thailand	Mouth of the Prasae River	East	12.70000	101.71667
341	Thailand	Pattani Bay	Pattani	6.91667	101.30000
342	USA	Cinder Lagoon	Alaska	57.20000	-158.10001
343	USA	Egegik Bay	Alaska	58.19509	-157.47376
344	USA	Port Heiden	Alaska	56.75000	-159.00000
345	USA	Port Moller/Nelson Lagoon/Mud Bay	Alaska	55.50000	-161.00000
346	USA	Pribilof Islands	Alaska	57.40000	-170.24667
347	USA	Yukon-Kuskokwim Delta	Alaska	61.36670	-163.71670
348	Vietnam	Can Gio	Ho Chi Minh City	10.54611	106.90000
349	Vietnam	Hoa Trinh	Ben Tre	10.20000	106.60000
350	Vietnam	Nghia Hung	Nam Dinh	19.96667	106.16667
351	Vietnam	Tan Thanh/Go Cong	Tien Giang	10.26967	106.77117
352	Vietnam	Thai Thuy	Thai Binh	20.55000	106.63333
353	Vietnam	Tien Lang District	Hai Phong	20.66667	106.66666
354	Vietnam	Xuan Thuy Ramsar Site	Thai Binh	20.35000	106.51667

Recommended citation:
Conklin, J.R., Y.I. Verkuil & B.R. Smith. 2014. *Prioritizing Migratory Shorebirds for Conservation Action on the East Asian-Australasian Flyway*. WWF-Hong Kong, Hong Kong

Back cover photograph: © Jesse Conklin. *Red Knot flock at the Firth of Thames, New Zealand (Site #264)*

Migratory Shorebirds on the East Asian-Australasian Flyway

100% RECYCLED

7.3 million

The minimum estimate of migratory shorebirds using the EAAF.

#1

Among the world's 9 major migratory flyways, the EAAF ranks #1 in both number of migratory bird species and total human population.

38%

Among 63 migratory shorebird populations in the EAAF, the proportion that are known or suspected to be declining.

20

The number of migratory shorebird populations in the EAAF that qualify for Near Threatened or higher status according to regional IUCN Red List criteria.

WWF · PRIORITIZING MIGRATORY SHOREBIRDS FOR CONSERVATION ACTION ON THE EAST ASIAN-AUSTRALASIAN FLYWAY

WWF

Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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