Australian Capital Territory

Nature Conservation (Listed Migratory Species) Action Plan 2018

Disallowable instrument DI2018–27

made under the

Nature Conservation Act 2014, s 104 (Draft action plan—revision) and s 105 (Draft action plan—final version and notification)

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1 Name of instrument

This instrument is the *Nature Conservation (Listed Migratory Species) Action Plan 2018.*

2 Commencement

This instrument commences on the day after its notification day.

3 Preparation of an action plan

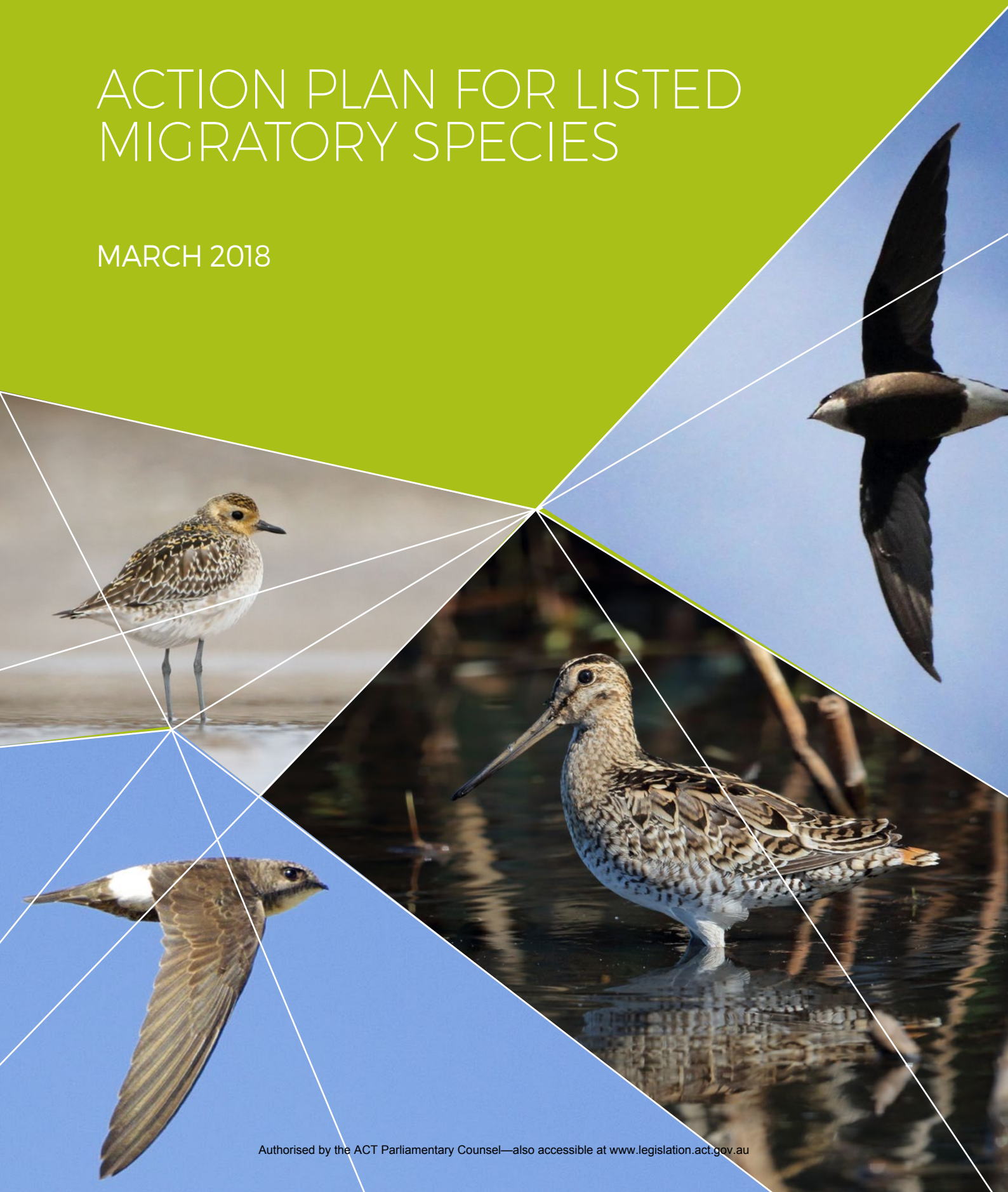
Schedule 1 to this instrument sets out the final version of the action plan for listed migratory species prepared by me.

Daniel Iglesias
Conservator of Flora and Fauna
15 February 2018

ACT Government

ACTION PLAN FOR LISTED MIGRATORY SPECIES

MARCH 2018



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Top right - White-throated Needletail.
Photo: Mick Roderick

Top Left - Pacific Golden Plover.
Photo: Dean Ingwersen

Bottom right - Latham's Snipe.
Photo: Andrew Silcocks

Bottom left - Fork-tailed Swift.
Photo: Dean Ingwersen

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Long-toed Stint. Photo: Dan Weller (Birdlife Australia)

GLOSSARY

Term	Description
Accidental	A species recorded outside its normal range
Altitudinal migrant	A species that generally breeds at high altitudes in summer and migrates to lower altitudes in winter (COG 2014a)
Bonn	Convention on the Conservation of Migratory Species of Wild Animals (Bonn)
Breeding	A species that has been reported to have bred in the ACT
CAMBA	China-Australia Migratory Bird Agreement
CBN	Canberra Bird Notes
Cosmopolitan	A species with a world-wide distribution
EAA Flyway	East Asian-Australasian Flyway
Ecological indicators	Ecological indicators are used to communicate information about ecosystems and the impact human activity has on ecosystems.
IUCN	International Union for Conservation of Nature
JAMBA	Japan-Australia Migratory Bird Agreement
JWNR	Jerrabomberra Wetlands Nature Reserve
Listed migratory species	A species listed under s. 209 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
Migrant	A species that moves between the ACT and other locations, usually on a regular annual cycle, usually breeding in one location but not the other (COG 2014)
Montane	Inhabiting mountainous areas
NC Act	*Nature Conservation Act 2014* (ACT)
Performance Indicator	A Performance Indicator is a measurable value that demonstrates how effectively the Action Plan is achieving its objectives.
Pedoderm	A geological subsurface feature — in this case associated with the Horse Park Wetlands.
Ramsar	Convention on Wetlands of International Importance especially as Waterfowl Habitat (the Ramsar Convention)
Resident	A species that resides permanently in the ACT, observed all year round.
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
Scientific Commitee	A statutory committee established under the *Nature Conservation Act 2014* (s. 31).
Shorebird	Birds which are members of the order Charadriiformes which excludes the marine web-footed seabird groups.
Summer migrant	A species that spends the warmer part of most years in the ACT, generally arriving in spring and departing in autumn (COG 2014).
Vagrant	The ACT is not part of its usual range or habitat, and it does not show a pattern of regular seasonal movements to and from the ACT (COG 2014).
Visitor	A species not resident in the ACT, its normal range encompasses this region but it does not show a pattern of regular seasonal movements to and from the ACT (COG 2014).
Wader	Birds which are members of the order Charadriiformes which excludes the marine web-footed seabird groups. Waders are called 'shorebirds 'in North America where the term 'wader' is used to refer to long-legged water birds such storks and herons.
Winter migrant	A species that spends the cooler part of most years in the ACT, generally arriving in autumn and departing in spring (COG 2014).

1 BACKGROUND AND CONTEXT

1.1 INTRODUCTION

This plan identifies actions to protect and manage the habitat of migratory species listed under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) which regularly visit the ACT. The plan outlines the ACT Government's contribution to the regional and national conservation of these species while they are present in the ACT.

The conservation objective of this action plan (the plan) is to maintain, conserve and enhance habitats in the ACT. Specific goals under the plan are to:

- protect, restore and enhance important wetland, wildlife corridors and breeding habitat
- manage identified threats to important sites and habitat
- improve knowledge about the occurrence and management of listed migratory species in the ACT with particular focus on Latham's Snipe
- raise community awareness, knowledge, and engagement in initiatives to survey and conserve listed migratory species.

The plan also informs environment impact assessment and land use planning processes (**see Box 1**). It identifies strategies and actions to improve the management and habitats of listed migratory species in the ACT.

The data used to develop this plan was provided by the Canberra Ornithologist's Group (COG).

Box 1 - Environmental impact assessment of listed migratory species

Listed migratory species are a matter of national environmental significance. Under the EPBC Act, if an action has, will have, or is likely to have a significant impact on a listed migratory species the action will require approval. An action is likely to have a significant impact on a migratory species if there is a real chance or possibility it will:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

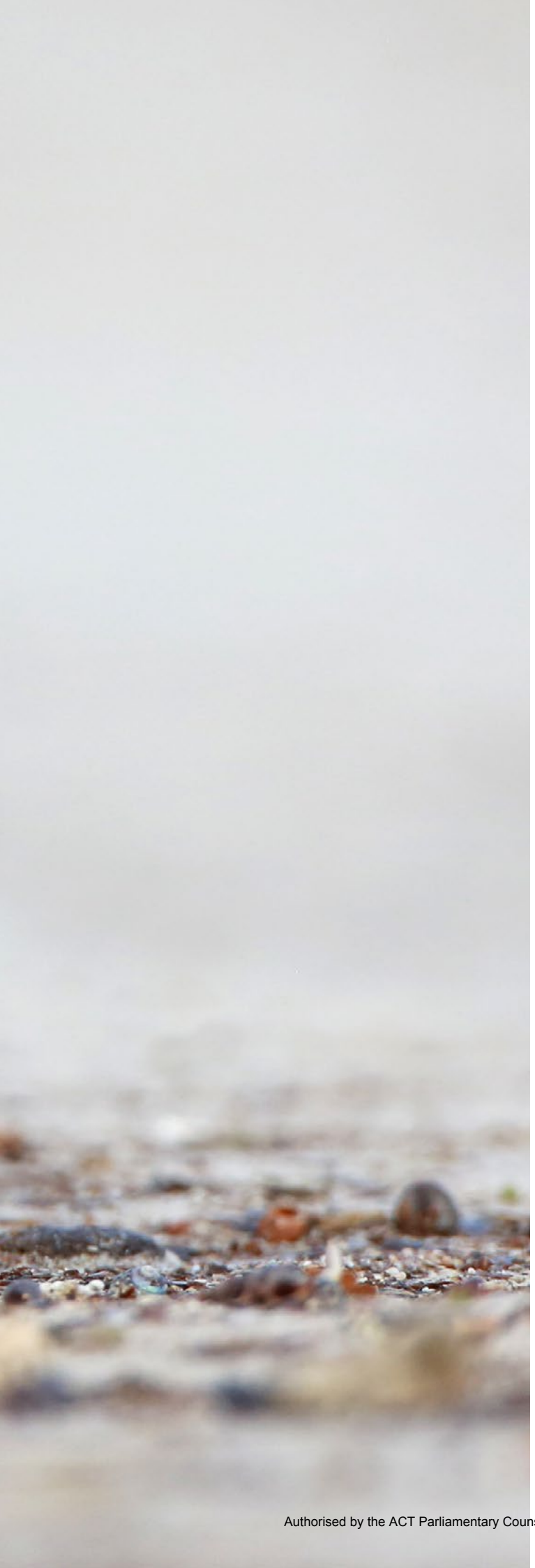
Listed migratory species have been provided with special protection status under ACT law since July 1989. A consequence of the special protection status is that they are subject to environmental assessment under the *Planning and Development Act 2007* (P&D Act).

A Bilateral Environmental Impact Statement (EIS) can potentially apply to proposals that require assessment under the P&D Act and also under the EPBC Act. The Australian Government has accredited the ACT's EIS process through a bilateral agreement as meeting the environmental assessment requirements of the EPBC Act.

If a proposed action is determined to be a 'controlled action' under the EPBC Act and requires an EIS under the P&D Act, the ACT Government may invoke the bilateral agreement. If the bilateral agreement applies, the subsequent scoping document and EIS assessment report will be prepared by the ACT with input from the Australian Government.

The final EIS assessment report endorsed by the ACT Minister for Planning is provided to Australian Government Department of Environment and Energy for use in their approval process under the EPBC Act. Once the EIS process is completed an impact track development application for the proposal can be submitted for assessment that will take into account the findings and recommendations of the completed EIS and any conditions of approval related to the Australian Government decision.

Double-banded Plover. Photo: Dan Weller (Birdlife Australia)



1.2 SCOPE OF THE ACTION PLAN

In accordance with s. 101 of the *Nature Conservation Act 2014* (NC Act) the Conservator of Flora and Fauna (the Conservator) is required to prepare a draft action plan for each 'relevant species', 'relevant ecological cowmmunity' or 'key threatening process'.

Under s. 98 of the NC Act a 'relevant species' is defined to include 'a regular migratory species', which means a listed migratory species that regularly occurs in the ACT. The Dictionary to the NC Act refers to section 528 of the EPBC Act. Section 528 of the EPBC defines 'Listed migratory species' to mean a migratory species included in the list referred to in section 209.

Therefore, a regular migratory species is a listed migratory species under the EPBC Act (s. 209) that has been regularly recorded (more than 10% of years) within the ACT.

Twenty-seven bird species on the EPBC Act list (s. 209) have been recorded in the ACT. Thirteen of those species occur in more than 10% of years and are considered regular (**Table 1**). **Table 1** also indicates the breeding territory and the regularity of occurrence in the ACT of each species, grouped according to habitat use (**see section 4.2**).

Other species listed under the EPBC Act occur ireggularly in the ACT **(Table 2).** Some species have only been sighted once in the ACT; for example, Red Knot, Gull-billed Tern, White-winged Black Tern and Common Tern. Where species occur irregularly (assessed as in 10% or less of years) they are not considered in this plan (but information on them is included at **Appendix 1**). They will be included in future versions of the plan if monitoring shows they occur more regularly. One butterfly species that occurs in the ACT from time to time is on the list, but is not considered in this plan as it is an introduced species.[1]

1 The Wanderer or Monarch Butterfly, Danaus plexippus, is a listed migratory species under the EPBC Act that occurs in the ACT; however, it is native to the Americas where its migration between Canada, USA and Mexico is covered by the Bonn Convention. The Monarch Butterfly is (almost certainly) introduced to Australia and is dependent on an introduced milkweed (its food plant in the Americas but an urban garden weed in Australia). The Monarch Butterfly is not considered within this plan.

Table 1: Listed migratory species regularly occurring in the ACT also showing their regularity of occurrence in the ACT from 1974–2014

Common name[1]	Scientific name[1]	Breeding territory	Occurrence in the ACT[2] (COG 2014a)	Regularity (% of years)[3]
Swifts				
White-throated Needletail	*Hirundapus caudacutus*	Northern Hemisphere	Uncommon, non-breeding summer migrant	89
Fork-tailed Swift	*Apus pacificus*	Northern Hemisphere	Rare, non-breeding summer migrant	55
Shorebirds				
Latham's Snipe	*Gallinago hardwickii*	Northern Hemisphere (Japan, far-eastern Russia)	Non-breeding summer migrant	97
Double-banded Plover	*Charadrius bicinctus*	New Zealand	Non-breeding winter vagrant	16
Common Sandpiper	*Actitis hypoleucos*	Northern Hemisphere	Non-breeding vagrant	37
Common Greenshank	*Tringa nebularia*	Northern Hemisphere	Uncommon, non-breeding summer migrant	21
Marsh Sandpiper	*Tringa stagnatilis*	Northern Hemisphere	Non-breeding migrant	18
Red-necked Stint	*Calidris ruficollis*	Northern Hemisphere	Non-breeding vagrant	16
Sharp-tailed Sandpiper	*Calidris acuminata*	Northern Hemisphere	Uncommon, non-breeding summer migrant	79
Waterbirds				
Glossy Ibis	*Plegadis falcinellus*	Northern Hemisphere Southern Hemisphere Mainland Australia	Non-breeding visitor	63
Flycatchers[6]				
Rufous Fantail	*Rhipidura rufifrons*	Southern Hemisphere Mainland Australia ACT	Uncommon, breeding summer migrant	89
Satin Flycatcher	*Myiagra cyanoleuca*	Southern hemisphere Mainland Australia ACT	Uncommon, breeding summer migrant	97
Black-faced Monarch	*Monarcha melanopsis*	Southern Hemisphere Mainland Australia	Non-breeding vagrant	42

Note 1: The common and scientific names for species cited in this plan follow the nomenclature used by the Australian Faunal Directory (ABRS, 2009). For birds, this nomenclature is consistent with the Birdlife Australia Working List of Australian Birds, Version 2 (Birdlife Australia, 2016).

Note 2: The listed migratory species are present for only part of a calendar year in the ACT. Most of these species are mostly regarded as having 'visitor', or 'summer migrant' status by observers based in the ACT (COG, 2014a). Some species considered by COG to be vagrant occur in more than 10% of years and have therefore been included in the plan. Table 1 does not include listed migratory species which are 'accidental', 'doubtful' or 'not properly documented' species observed in the ACT and identified in the supplementary list to the Annotated Checklist of the Birds of the Australian Capital Territory (COG 2014b). It does not include species that occur in 10% or less of years surveyed.

Note 3: The regularity of occurrence is indicated by the percentage of years the listed species have been recorded by COG within the period 1974–2014. Surveys did not occur in all years.

Note 4: Generally speaking, species which have been recorded in more that 50% of years have been designated by COG in their Annotated Checklist of the Birds of the ACT as either 'common', uncommon' or 'migrant' species. Species observed in less than 50% of years have been designated as 'visitor', 'vagrant' or 'rare' species (COG 2014a, b). COG uses a qualitative rather than a single quantitative measure to determine which status class applies to individual bird species.

Note 5: The Australian Government has advised that the Migratory Species Conference of Parties meeting (COP12) on 23-28 October 2017 decided to adopt the new taxonomic authority (Del Hoyo and Collar 2016) for listing migratory birds. This may result in the flycatcher species being delisted from the Appendix II of the Convention on Migratory Species. Should that occur, this plan will need to be amended to remove those species.

Table 2: Listed migratory species occurring irregularly in the ACT

Common name[1]	Scientific name[1]	Breeding territory	Occurrence in the ACT2 (COG 2014a)	Regularity (% of years)
Shorebirds				
Ruddy Turnstone	*Arenaria interpres*	Northern Hemisphere	Non-breeding vagrant.	6
Pacific Golden Plover	*Pluvialis fulva*	Northern Hemisphere	Non-breeding vagrant.	6
Bar-tailed Godwit (Western Alaskan subspecies)	*Limosa lapponica baueri*	Northern Hemisphere	Non-breeding vagrant.	3
Eastern Curlew	*Numenius madagascariensis*	Northern Hemisphere	Non-breeding vagrant.	6
Wood Sandpiper	*Tringa glareola*	Northern Hemisphere	Non-breeding vagrant	8
Red Knot	*Calidris canutus*	Northern Hemisphere	Non-breeding vagrant	3
Curlew Sandpiper	*Calidris ferruginea*	Northern Hemisphere	Non-breeding vagrant	10
Pectoral Sandpiper	*Calidris melanotos*	Northern Hemisphere	Non-breeding vagrant	10
Long-toed Stint	*Callidris subminuta*	Northern Hemisphere	Non-breeding vagrant	3
Terns				
Gull-billed Tern	*Gelochelidon nilotica*	Mainland Australia	Non-breeding vagrant	3
Caspian Tern	*Hydroprogne caspia*	Northern Hemisphere Mainland Australia	Non-breeding vagrant	10
White-winged Black Tern	*Chlidonias leucopterus*	Northern Hemisphere New Zealand	Non-breeding vagrant	3
Common Tern	*Sterna hirundo*	Northern Hemisphere	Non-breeding vagrant (Eremaea eBird 2014)	3
Raptor				
Eastern Osprey[1]	*Pandion haliaeteus*	Southern Hemisphere Mainland Australia	Non-breeding vagrant	8

1. The Eastern Osprey is a Convention of Migratory Species (CMS) Appendix II listing. Members of the Australian population may move beyond (the) Australian jurisdiction: seasonal increases in Eastern Osprey numbers in Sulawesi are partly due to the arrival of birds from further south, presumably from Australia. Birds sighted in the ACT are not part of this migratory population and the Species is not therefore included in the plan or the Appendices.

Many of the actions for species that are included in the plan will also benefit other bird species including those in **Table 2** and species not listed as migratory.

Appendix 1 includes profiles of all the listed migratory species that have been observed in the ACT. This resource aims to improve the availability of information and knowledge of listed migratory species and their habitats within the ACT and includes species that occur irregularly in the ACT as well as the more regular migrants subject to the plan.

2 THREATS TO MIGRATORY SPECIES

2.1 THREATS TO LISTED MIGRATORY SPECIES ACROSS THEIR RANGE

An evaluation of the threats was undertaken. This reflects information[2] for each listed species summarised in the species' profiles.

2.1.1 Habitat loss

The greatest threat to all species–habitat groups is direct and indirect habitat loss both in Australia and overseas. Australia's *Wildlife Conservation Plan for Migratory Shorebirds* confirms that loss of coastal habitat in Australia due to development and 'reclamation' is a significant threat to species (Commonwealth of Australia 2015a, b). It is estimated that since European settlement approximately 50% of Australia's non-tidal wetlands have been converted to other uses (Commonwealth of Australia 2015a, b).[3] More wide-ranging shorebird species in inland Australia such as the Latham's Snipe, Double-banded Plover and Sharp-tailed Sandpiper continue to be threatened by loss of suitable ephemeral habitat.

The East Asian–Australasian Flyway (the Flyway) is of primary importance to shorebirds migrating between Australia and other countries (**see Box 2**). Staging areas used during migration in eastern Asia are being lost and degraded through reclamation of mudflats for development or for aquaculture (Barter 2002, 2005; Ge et al. 2007).

Box 2 - East Asian–Australasian Flyway

A flyway is the entire range that a migratory bird species (or groups of related species or distinct populations of a single species) moves through on an annual basis from the breeding grounds to non-breeding areas, including intermediate resting and feeding places as well as the area within which the birds migrate (Boere and Stroud 2006).

The East Asian–Australasian Flyway stretches from the Russian tundra, Mongolia and Alaska southwards through Asia to nonbreeding areas in Indonesia, Papua New Guinea, Australia and New Zealand.

Hundreds of thousands of birds of at least 178 waterbird species use this migration path every year. Twenty-one species of migratory birds have more than 95% of their entire global population within the East Asian–Australasian Flyway.

Most of the migratory shorebirds identified in the plan use the East Asian-Australasian Flyway on their migration. The exception to this is the Double-banded Plover, which breeds in New Zealand during the southern hemisphere summer with non-breeding birds over-wintering in mainland Australia.

2 Information has been compiled by the International Union for the Conservation of Nature (IUCN) threat classification version 1.1 which applies to the species throughout its world distribution. The Threat Database, 'SPRAT' (Department of Environment 2015b) also includes documented threats to species in Australia, citing Australian sources including Australia's Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia 2015). Additional information on documented threats to species from local ACT sources e.g. ACT (2010), has been incorporated

3 In some regions the rate of loss has been even higher. In the Swan Coastal Plain of Western Australia 75% of wetlands have been lost and in south-east South Australia it is estimated 89% have been lost. Drainage and conversion of wetlands for agricultural uses has been a major cause of wetland loss both in Australia and worldwide

Pacific Golden Plover. Photo: Dean Ingwersen

2.1.2 Habitat degradation

Habitat degradation is of equal significance to habitat loss within Australia for all species-habitat groups, with the exception of the swifts. Degradation can result from, for example: (1) loss of vegetation; (2) introduced species; (3) water pollution; (4) changes in hydrology; (5) exposure to acid-sulphate soils (Department of the Environment 2015a, b).

Degradation of wetlands is of particular significance as a threat to shorebirds and waterbirds.

Specific examples of habitat degradation of significance to shorebird species include:

- cessation of grazing affecting wintering of Double-banded Plovers at key sites in Victoria; the species requires grazed pasture to regularly feed and roost (Marchant and Higgins 1993)
- mowing during summer, which can render Latham's Snipe habitat unsuitable for months (Frith et al. 1977).

Specific examples of habitat degradation of significance to waterbird species include:

- the Glossy Ibis is susceptible to degradation of foraging and breeding habitat through:
  - alteration of water flows and drainage (limiting inundation of wetlands)
  - too frequent burning of wetlands
  - salinisation (Kushlan and Handcock 2005).

An identified threat to the flycatcher species–habitat group in Australia is habitat fragmentation and degradation due to logging (Department of the Environment 2015a, b). However, these threats are not regarded as significant in the ACT.

2.1.3 Plant and animal invasion

While many aquatic weeds are of tropical and sub-tropical occurrence in Australia (e.g. Salvinia, Water Hyacinth) all have the capacity to grow rapidly under favourable seasonal conditions and some (e.g. Alligator Weed, Water Lettuce) exhibit characteristics enabling them to persist under short-term frosty or dry periods. Waterbirds are an acknowledged vector for spread of Salvinia. Alligator Weed is an acknowledged threat to the Australian turf industry and can contaminate the wetter sections of grazing pastures, which is habitat often favoured by Latham's Snipe.

Introduced animals such as pigs and exotic fish, in particular Carp, can have direct destructive impacts on wetland areas and, indirectly, on waterbirds. Red Foxes directly impact waterbird species. Rabbits and Common Starlings can degrade the habitat of waterbirds. Feral cats and roaming domestic cats and dogs have negative impacts on wetlands and riparian areas.

2.1.4 Disturbance

Disturbance is a significant threat to birds in Australia, most particularly to shorebirds and waterbirds. Disturbance can result from a wide variety of sources including aircraft, industrial operations, construction, recreational activities (e.g. fishing, off-road driving), fire, unleashed dogs and jet-skiing.

2.1.5 Direct mortality

Direct mortality is a threat to shorebirds worldwide due to construction of wind farms in migration or movement pathways, bird strike due to aircraft, hunting, chemical and oil spills (DEWHA 2009).

Tern species are known to be susceptible to mortality due to unseasonal weather events, particularly at exposed breeding sites. Exposure to bio-accumulants in fish is a risk but is not yet considered a significant impact on breeding success.

Swifts are known to collide with overhead wires, windows and lighthouses while on migration, but these events are rare and are unlikely to impact on overall species' populations (Department of the Environment 2015a, b).

2.1.6 Pollution

Migratory shorebirds are threatened by accumulated pollution and excess nutrients both within Australia and along their migration flyway, although the amount and results of such exposure remain largely unknown.

Agricultural, residential and catchment run-off carries excess nutrients, heavy metals and sediments into waterways and wetlands, potentially affecting shorebirds and waterbirds. In feeding areas, shorebirds are most at risk from chemicals such as organochlorines from herbicides, pesticides and industrial waste including accidental releases affecting benthic prey fauna (Harding et al. 2007).

Salinisation is a potential threat to snipe species (Melville 1997).

2.1.7 Predation

Direct predation on shorebird and waterbirds and their eggs is a threat, particularly at their breeding grounds in the Northern Hemisphere where many species nest on the ground.

Predation by cats, dogs and foxes is a greater risk where important shorebird and waterbird habitat is close to higher density urban developments and residential areas where artificially higher densities of these introduced predatory animals occur.

2.1.8 Hunting

Historically, hunting of shorebirds has had a significant impact on many species worldwide. The Latham's Snipe has been impacted by hunting[4] and the Eastern Curlew was shot for food in Tasmania in the past (Marchant and Higgins 1993).

2.1.9 Climate change

Climate change projections for Australia suggest likely increased temperatures, rising sea levels and an overall drying trend together with more frequent and/or intense extreme weather events resulting in likely species loss and habitat degradation (Chamber et al. 2005). Climate change may reduce the extent of shorebird and wetland habitat within inland and coastal wetlands through drying trends, or through expected poleward shifts in the distribution of the breeding habitats for several shorebird species (Rehfisch and Crick 2003). Sea level rise is a significant threat to migratory shorebirds in coastal habitats.

The most important impacts on migratory birds due to climate change affect them at their breeding grounds outside Australia or at sites on the birds' migration routes.

Smith and Smith (2016) analysed the arrival of 16 migratory species in south-east Australia and found that the species were arriving in Australia on average 4.4 days earlier per decade from 1980 to 2011. This shows a significant relationship between arrival dates and temperature, particularly minimum temperature.

4 The Latham's Snipe was hunted legally in eastern Australia until 1984, with up to 10,000 birds being taken annually. Bans were introduced in NSW in 1976, Tasmania in 1983 and Victoria in 1984.

2.2 SPECIFIC THREATS IN THE ACT

2.2.1 Habitat loss

More wide-ranging shorebird species in inland Australia such as the Latham's Snipe, Double-banded Plover and Sharp-tailed Sandpiper continue to be threatened by loss of suitable ephemeral habitat, such as through the the drainage and modification of wetlands (Frith et al. 1977; Naarding 1986). Wetland habitats occupied by Latham's Snipe are threatened by diversion of water for storage or agriculture and development of land for urban or other purposess (Frith et al. 1977; Garnett and Crowley 2000). The threat of habitat loss in the ACT is assessed through impact assessment under the P&D Act or the EPBC Act.

2.2.2 Habitat degradation

The wetland habitats occupied by Latham's Snipe may be threatened by land management practices such as mowing of habitat during summer, which can render it unsuitable for several months (Frith et al. 1977; Garnett and Crowley 2000).

The most significant identified threat to Double-banded Plovers while wintering in Australia is the cessation of grazing. Cessation of grazing at the most important sites for this species in the ACT and Region, Lake Bathurst East ('The Morass') and Jerrabomberra Wetlands, would likely have a negative impact on the occurrence of the species. The lack of grazing (or other biomass management is also likely to impact the Latham's Snipe through impacting wetland margins.

Habitat modification through clearing, grazing, burning, increased salinity, groundwater extraction and invasion by exotic plants and fish species are also threats to the species. The bird is locally threatened in some areas by hunting and through use of pesticides (del Hoyo et al. 1992; Marchant and Higgins 1990). The species is susceptible to avian influenza, so may be threatened by future outbreaks of the virus (BirdLife International 2010). Human disturbance is a possible threat (Burger and Gochfield 1998).

2.2.3 Plant and animal invasion

Management of the threat of weed invasion of open space and reserves with important wetland habitat utilised by listed migratory species is carried out in accordance with the relevant ACT legislation (*Pest Plants and Animals Act 2005*) and strategies (ACT Weeds Strategy 2009–19; ACT Pest Animal Management Strategy 2012–22).

Management of wetland areas requires ongoing removal of willows, poplars, cotoneaster, hawthorn, blackberry and boxthorn. Introduced wetland plant species such as Salvinia, Alligator Weed, and Mexican Waterlily, which occur in the ACT, and Water Hyacinth, which has potential to occur, can also adversely impact on wetland habitat. Aquatic weeds and and wetland margin weed species are monitored and controlled.

Introduced animals such as pigs and exotic fish, in particular Carp, can have direct destructive impacts on wetland areas and, indirectly, on waterbirds. Rabbits and Common Starlings can degrade the habitat of waterbirds.

2.2.4 Disturbance

Recreational activities including direct human intrusion, dogs and night lighting are acknowledged as threats for the three shorebird species which occur most regularly in the ACT: Latham's Snipe, Sharp-tailed Sandpiper and the Common Sandpiper (Department of the Environment 2015a, b; ACT 2010). However, Latham's Snipe occupies wetlands and is also known to occur at sites that are prone to disturbance, e.g. near industrial complexes, roads, railways, airfields and within school grounds (Higgins and Davies 1996).

Disturbance at critical times can limit capacity for birds to build sufficient energy reserves for migration and is a significant threat. Shorebirds are most susceptible during daytime roosting and foraging periods. Human disturbance is greatest where high human population densities impact upon important habitat.

2.2.5 Predation

Red Foxes, feral cats and roaming domestic cats and dogs directly impact shorebird and waterbird species through predation. Predation by cats, dogs and foxes is a greater risk where important shorebird and waterbird habitat is close to higher density urban developments and residential areas where artificially higher densities of these introduced predatory animals occur.

Some ACT wetlands are close to high density urban developments, such as the Kingston Foreshore and East Lake areas, and predation needs to be managed.

2.2.6 Climate change

There is no specific evidence that the timing of migration has affected bird arrival in the ACT. Wilson et al. (2017) analysed 170 years of arrival dates of Latham's Snipe in NSW and the ACT over a 170 year period. Their results suggest the migration timing of Latham's Snipe has not been strongly influenced by changing large-scale climatic conditions at either the breeding or non-breeding grounds. Consequently, climate impacts on particular listed migratory species visiting the ACT may be expected, but not assumed.

Ongoing monitoring of arrival and departure times of the ACT's listed migratory birds, particualry the Latham's Snipe as the most regular and frequently observed species, is most likely to be the means by which any significant changes are first noticed.

3 IMPORTANT HABITAT FOR MIGRATORY SPECIES

3.1 EPBC Act considerations

Listed migratory species are a matter of national environmental significance under the EPBC Act. A s such, any action that has, will have, or is likely to have a 'significant impact' on a matter of national environmental significance will require approval. Substantial penalties apply for taking such actions without approval. Assessment of actions may be undertaken under ACT law through bilateral assessment arrangements.

Identification of 'important habitat' for migratory shorebirds is a key concept in determining the likelihood of significant impact from proposed actions. The Commonwealth has issued a policy statement to assist with determination of important habitat and the likelihood of significant impacts from proposed actions for migratory shorebirds (Commonwealth of Australia 2017).

Under the EPBC Act, 'important habitat' is a key concept for migratory species, as identified in EPBC Act Policy Statement 1.1 Significant Impact Guidelines—Matters of National Environmental Significance.

The approach to identifying internationally important shorebird habitat has been through the use of criteria adopted under the Ramsar Convention on Wetlands (with the exception of assessment for Latham's Snipe, see below).

Using these criteria, there are no nationally or internationally important habitat for shorebirds in the ACT (apart from Latham's Snipe). Latham's Snipe does not commonly aggregate in large flocks or use the same habitats as many other migratory shorebird species. Consequently, different criteria are necessary to identify habitat important to Latham's snipe. Important habitat for Latham's Snipe includes areas that support at least 18 individuals of the species (Commonwealth of Australia 2017). Three ACT sites surveyed may be nationally important based on recent survey results: Jerrabomberra Wetlands; Horse Park Drive Wetland; and West Belconnen Pond (**Appendix 2**).

Nationally important wetlands (**see Box 3**) within the context of other regional wetlands are shown in **Figure 1.**

Appendix 1 provides more detailed and comprehensive information on the relative importance of known sites, including urban and natural wetlands, for each of the listed migratory species. Management actions apply to all these important habitat areas unless specified as applying to particular sites.

Box 3 Directory of important wetlands

The Directory of Important Wetlands in Australia (the Directory), first published in 1993, identifies nationally important wetlands and provides a substantial knowledge base of what defines wetlands, their variety, and the many flora and fauna species that depend on them. In addition, the Directory contains information about their social and cultural values and some of the ecosystem services and benefits they provide.

The criteria for determining nationally important wetlands in Australia were agreed to by the Australian and New Zealand Environment and Conservation Council's Wetlands Network in 1994. A wetland may be considered nationally important if it meets at least one of the following criteria:

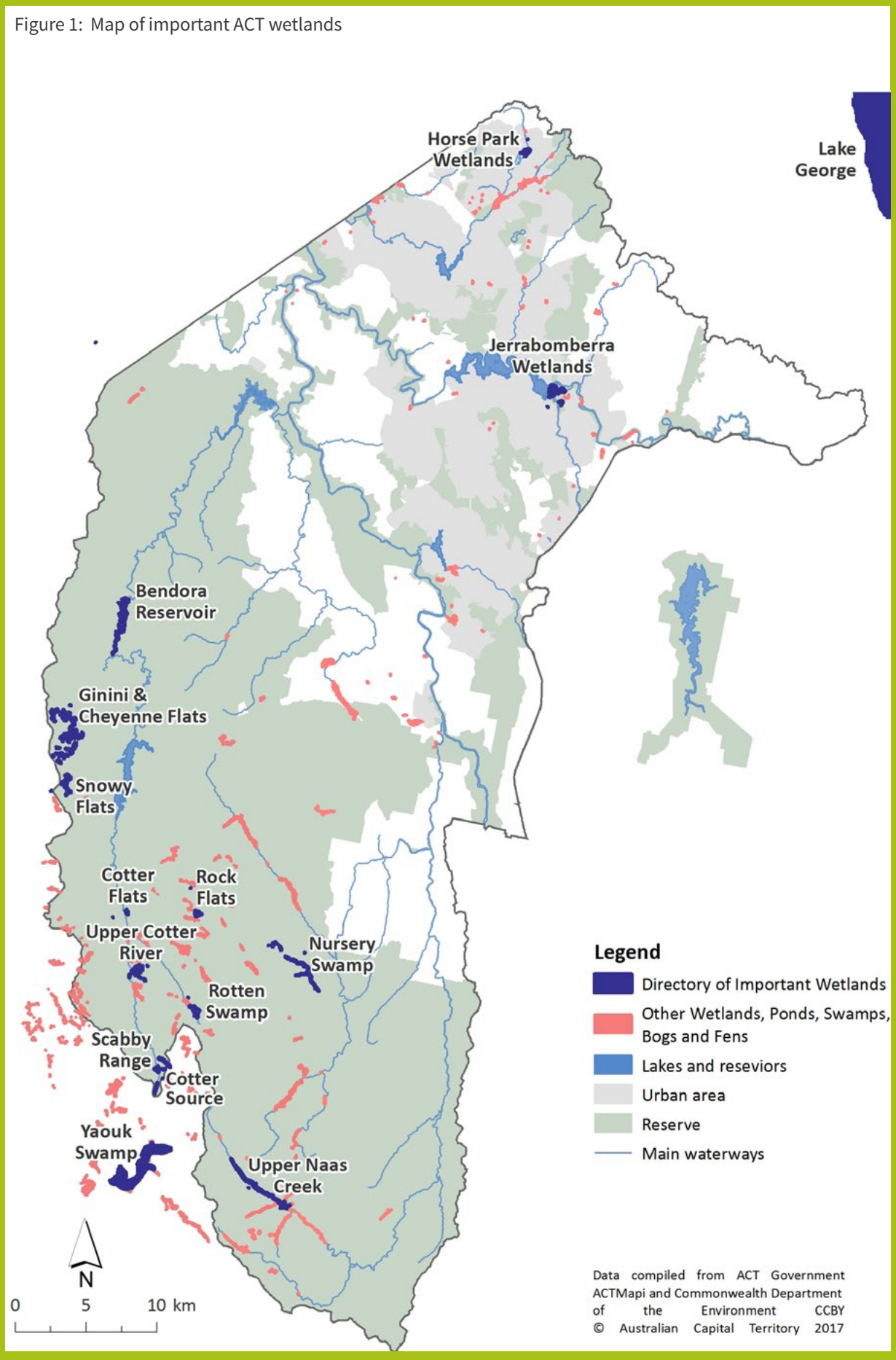
- It is a good example of a wetland type occurring within a biogeographic region in Australia.
- It is a wetland which plays an important ecological or hydrological role in the natural functioning of a major wetland system/complex.
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail.
- The wetland supports 1% or more of the national populations of any native plant or animal taxa.
- The wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the national level.
- The wetland is of outstanding historical or cultural significance.

The wetland classification system used in the Directory is based on that used by the Ramsar Convention in describing Wetlands of International Importance, but was modified slightly to suit the Australian situation in describing wetlands of national importance. The Directory identifies 40 different wetland types in three categories:

A. Marine and coastal zone wetlands
B. Inland wetlands
C. Human-made wetlands

The online inventory of the Directory is available at the Australian Wetlands Database and in the Directory of Important Wetlands in Australia Fact Sheet.

Figure 1: Map of important ACT wetlands



4 GOALS OF THE PLAN AND PRIORITISATION OF MANAGEMENT ACTIONS

4.1 Conservation objectives and management actions

Specific goals of this plan are to:

1. protect, restore and enhance important wetland, wildlife corridor and breeding habitat
2. manage identified threats to important sites and habitat
3. improve knowledge about the occurrence and management of Latham's Snipe in the ACT
4. raise community awareness and engagement in initiatives to survey and conserve listed migratory species.

Proposed management actions give effect to each of the four goals. A performance indicator[5] is specified for each proposed action to monitor implementation. The management actions are arranged based on species–habitat groups with some overarching management actions.

4.2 Species-habitat groups

To help prioritise actions, the migratory species have been grouped into 'species–habitat' groups according to similar ecological characteristics and habitat preferences. These groups are swifts, shorebirds, waterbirds and flycatchers (**Table 3**). Species–habitat groups are a useful organising structure for the actions as the management objectives focus on protecting and managing habitats and threats to habitats.

Table 3: ACT-listed regular migratory bird species grouped according to similar ecological characteristics and habitat

Species–habitat groups	Habitats listed with important ACT habitat
Swifts	Swifts are aerial, mainly at heights of 1 to 300 metres to 1000 metres or more above the ground.
Shorebirds	Shorebirds use shallow wetland margins (including lakes and ponds), mud flats, sewage ponds and river shallows.
Waterbirds	Waterbirds use exotic grassland, stock paddocks, marshland, well-vegetated freshwater wetland margins, sewage ponds, wet flooded pasture.
Flycatchers	Flycatchers use the undergrowth of wet and dry eucalypt forest and woodland gullies.

The habitats assigned to each species–habitat group are generally relevant to all the species in the group, although their degree of usage may vary significantly. While a species may have a preferred habitat type, it may also use other habitats at times. For example, while the Double-banded Plover is usually seen primarily in shallow water margins of freshwater wetlands in the ACT, it is well known that it may also use short grass paddocks, ploughed land and airfields from time to time (Pizzey and Knight 2012). Similarly, while Latham's Snipe utilise shallow, muddy waterbody margins as habitat, as do other listed migratory shorebirds, Latham's Snipe particularly also rely on extensive ephemeral flooded pasture or marshy habitat with more vegetative cover. The relatively common Sharp-tailed Sandpiper, the second most regularly recorded species, is most likely a better surrogate model for the habitat requirements of shorebirds generally in the ACT. More details of the particular habitat preferences that may apply to individual species are provided in the detailed species' summaries in **Appendix 1**.

5 The use of ecological indicators was not considered appropriate for this plan because the ACT is only a very small component of habitat used by the birds over the year. The actions undertaken in the ACT will reduce threats to migratory species while visiting the ACT, and benefit them and other species, but can only play a supporting role within the context of the birds' broader distribution.

Terns and the Eastern Osprey (a raptor) are listed migratory species that occur irregularly in the ACT. These species habitat groups are included in **Appendix 1**. Terns use freshwater wetland margins, lake shores, open water and sewage ponds, while the Eastern Osprey uses wetlands, lakes, river corridors and reservoirs.

The prioritisation of management actions considered whether the species breeds in the ACT. The protection of breeding habitat was also considered to be important as it is a critical time within a migratory species' lifecycle. Only two species have been recorded breeding in the ACT, the Rufous Fantail and the Satin Flycatcher.

4.3 Species habitat groups not requiring management actions and rationale

Some species occur regularly but do not need particular consideration within this plan.

Table 4 sets out the reasons specific management actions are not required for these species. The species profile (**Appendix 1**) provides sufficient guidance for those species.

Table 4: Species–habitat groups not requiring management actions and rationale

Species–habitat group	Species	Rationale for not requiring management actions
Swifts	White-throated Needletail *Hirundapus caudacutus* Fork-tailed Swift Apus pacificus	Swifts regularly visit the ACT, but are aerial specialists. As they seldom land, on-ground action is not required. There is no evidence that swift populations are threatened through air pollution impacts or collisions with built infrastructure.
Waterbirds	Glossy Ibis *Plegadis falcinellus*	Although they occur regularly in the ACT, they are not associated with particular habitat that would require specific management actions. They breed elsewhere in the Murray–Darling Basin.

Also management actions are not provided for species that do not occur regularly in the ACT. Management options are, therefore, proposed for shorebirds and flycatchers only.

Glossy Ibis. Photo: Dan Weller

5 GOALS

5.1 GOAL 1: Protect, restore and enhance important wetland, wildlife corridor and breeding habitat

5.1.1 Shorebirds

Important habitat for these species in the ACT is the Jerrabomberra Wetlands Nature Reserve (JWNR), including Jerrabomberra Creek, Kellys Swamp, and Jerrabomberra Wetlands Refuge Area and nearby off-reserve areas, primarily the Fyshwick Sewage Ponds[6] and Goldenholm Pond.

In addition to the Jerrabomberra wetlands area, Horse Park Drive Wetlands, West Belconnen Ponds, Mulligans Flat Dam are important for the Latham's Snipe.

JWNR and the Horse Park Wetlands (separate to Horse Park Drive Wetlands) are nationally important wetlands (Australian Directory of Important Wetlands in Australia, Environment Australia, 2001).

The Horse Park Wetlands are also included as part of the 1990 listing of the 'Horse Park Homestead Complex, Sedgeland and Surrounds' on the Register of the National Estate and are recognised as important habitat for Latham's Snipe (Lintermans, 1993; ACT Planning and Land Authority, 2008).

Urban wetlands developed for stormwater retention, such as West Belconnen Pond, Ginninderra Pond and Fyshwick Sewage Ponds, managed for sewage treatment, can provide habitat that is important for waterbirds and shorebirds. Such areas such are managed for their primary purpose but provide valuable secondary benefit for conservation.

Alpine bogs and fens are used by Latham's Snipe.

5.1.2 Flycatchers

Flycatchers use forest and woodland areas for cover on migration. The wet gullies in sclerophyll forest are important habitat for the flycatcher species. Open woodland is also important for the Satin Flycatcher and the Rufous Fantail. Flycatcher habitat is largely protected within conservation reserves, primarily Namadgi National Park and Tidbinbilla Nature Reserve.

6 The primary purpose of the lease to Icon Water for Fyshwick Sewage Ponds is for sewage treatment and reticulation. The nature conservation benefit from habitats provided at the ponds are a secondary to their primary purpose.

Table 5: Key objectives, actions and indicators—shorebirds

Objective	Action	Performance Indicator
1. Protect known sites and important habitat in the ACT.	Take migratory species habitat into account when undertaking management planning for JWNR and urban open space that includes wetlands. Regularly review important wetlands listings for the ACT.	Management plans for JWNR, and urban open space include material on protecting and managing habitat for migratory shorebirds and waterbirds. Updated information on the Australian Directory of Important Wetlands in Australia is available on the directorate's website.
2. Identify and manage areas of public land for their wetland values.	Review wetland areas on public land to determine whether current management is appropriate.	Review of wetlands is finalised.
3. Maintain mud flats and shallow water habitats at JWNR and Mulligans Flat Dam during the spring/ summer shorebird season from September to March each year.	Improve the ability to manage water levels to maintain habitat. Reduce biomass and monitor the effectiveness of the reduction.	Additional infrastructure to allow water levels to be managed is provided. The numbers of listed migratory shorebird species is maintained or increased.
4. Enhance habitat for shorebirds.	Where appropriate, in urban wetland areas provide areas of shallow water, mudflat and marshy habitat for shorebirds together with shorelines that have low gradients for waterbirds.[1] Encourage and support land managers with wetland areas on leased land to improve habitat for migratory species on land under their management.	Increase in number and area of urban wetlands. Increase in wetland areas on leased land managed for migratory species
5. Preserve the character and quality of exotic grassland areas adjacent to and within JWNR (e.g. Jerrabomberra Backwaters).	Use cattle grazing, where appropriate, as a management treatment for rural lands adjacent to wetlands to provide additional habitat for Latham's Snipe.[2]	Increase in observations of Latham's Snipe.

1 Urban wetlands are created for the management of stormwater. This requires them to be designed in particular ways to manage them for their primary purpose. Where it is feasible and not contrary to their primary purpose, these wetlands may include suitable habitat that might be used by migratory shorebirds and waterbirds. Maintenance of these areas for their stormwater management purpose will be needed.

2 This will also benefit the Glossy Ibis.

Table 6: Key objectives, actions and indicators—flycatchers

Objective	Management Action	Performance Indicator
1. Manage known sites and important habitat in the ACT.	Take flycatcher habitat needs into account during management planning for Namadgi and Tidbinbilla.	Management actions for flycatchers are included within reserve management plans.
2. Maintain important breeding and foraging habitat for flycatcher species.	Encourage citizen science to monitor breeding and foraging by flycatchers in forest and woodland gullies.	Records identify the location and extent of important breeding and foraging habitat.

5.2 GOAL 2: Manage identified threats to important sites and habitat

5.2.1 Shorebirds

Invasive and roaming domestic animals are major threats, particularly close to urban residential areas. The impact from predation is a risk that is being managed. Active monitoring of predator impacts by cats, dogs and foxes is currently undertaken by management at JWNR in the ACT (Maconachie M. 2016 *pers. comm.*).

Disturbance of shorebird habitat from mowing operations is minimised around urban wetlands through wider mowing strips.

Recreation impacts need to be managed at wetlands close to urban development.

Table 7: Key objectives, actions and indicators—shorebirds

Objective	Action	Performance Indicator
1. Monitor presence of invasive and roaming domestic animals (foxes, cats, dogs) at JWNR.	Use remote camera trapping techniques to monitor predators.	Camera trapping techniques for monitoring predators are deployed.
2. Monitor visitor disturbance.	Set up a visitor monitoring system at JWNR near important foraging habitat at Kellys Swamp and Jerrabomberra Backwaters from September to March, when shorebirds use the area. Manage public access into Horse Park Wetlands. Provide signage to inform visitors about the Horse Park Wetlands.	Visitor monitoring is undertaken. Signage is provided.
3. Reduce impacts from roaming domestic cats at JWNR and Horse Park Wetlands.	Review and improve cat management including cat containment near wetlands.	Adoption of cat containment in areas adjacent to wetland areas.
4. Reduce impacts from roaming domestic animals (dogs).	Review impacts of dogs around wetland areas including dog off-leash areas. Maintain the prohibition of dogs within JWNR and at Horse Park Wetlands.	Review completed.
5. Manage impacts of predation by invasive animals through ongoing pest management at JWNR.	Investigate the feasibility of broader pest control programs (e.g. foxes, feral cats, wild dogs) at JWNR. Monitor effectiveness of pest management at JWNR and Horse Park Wetlands.	Feasibility study undertaken. Annual operational programs indicate effectiveness of monitoring.
6. Manage recreation to limit disturbance at key wetlands including JWNR and Horse Park Wetlands.	Included provisions to manage disturbance, such as through education, Activities Declarations or management of access, in management and operation plans.	Management plans include provisions to address disturbance.
7. Monitor the water quality at key sites including at JWNR.[1]	Monitor and analyse water quality at JWNR on an ongoing basis.	Monitoring shows no decline in water quality or the health of wetlands.
8. Manage impacts of residential development on wetland sites.	Consider noise and lighting impacts from residential or recreational development in concept and estate development plans near wetland sites.	Impacts from residential development are considered in development plans.

1Water quality monitoring is undertaken by a range of organisations: ACT Government agencies, the National Capital Authority, Icon Water and volunteers (Waterwatch). The Catchment Health Indicator Program reports on water quality in the Jerrabomberra Creek which flows into the wetlands see http://www.act.waterwatch.org.au/chip.html.

5.2.2 Flycatchers

Important habitat for the flycatcher species are the wet gullies in sclerophyll forest. Open woodland is also important for the Satin Flycatcher and the Rufous Fantail. Flycatcher habitat is largely protected within conservation reserves, primarily Namadgi National Park and Tidbinbilla Nature Reserve.

Table 8: Key objectives, actions and indicators—flycatchers

Objective	Action	Performance Indicator
1. Maintain breeding success for Rufous Fantail and Satin Flycatcher.	Encourage citizen science to monitor breeding and foraging by flycatchers in forest and woodland gullies.	Up-to-date records of the location and extent of flycatcher breeding habitat are kept and used to inform adaptive management.

5.3 GOAL 3: Improve knowledge about the occurrence and management of listed migratory species in the ACT with particular focus on Latham's Snipe

Latham's Snipe is the most regular and frequently reported shorebird species recorded in the ACT, having been recorded in all years for the last 35 years. Although it is a cryptic species that is generally difficult to observe, it is a relatively large species that can be readily surveyed in its preferred habitat. Latham's Snipe has the ability to use a wider variety of shallow water and marsh habitat locally than other shorebird species, including flooded pasture on rural lands and higher altitude natural wetlands and alpine bogs. It is therefore the locally occurring species most suited to ongoing monitoring work and survey by volunteers, particularly COG, including in collaboration with Australian and international partners.

Table 9: Key objectives, actions and indicators

Objective	Action	Performance Indicator
1. Increased knowledge about the role of JWNR, Horse Park Drive Wetlands and other West Belconnent Pond and ACT wetlands for Latham's Snipe.	Participate in cooperative regional and national conservation and research programs for the observation of listed migratory species, including: • Latham's Snipe Japan-Australia Foundation (2015) • Jerrabomberra Wetlands Latham's Snipe Project (ACT Govt 2016 *unpubl.*)[1,2] Support expansion of the COG Waterbird Survey (WBS) to cover key sites in the ACT (e.g. JWNR, Fyshwick Sewage Ponds, major urban lakes and ponds).[3,4] Encourage citizen scientists in the Canberra community to record opportunistic observations of migratory species and to participate in systematic surveys.	Completion of annual ACT-wide Latham's Snipe surveys. COG's regular three-monthly surveys continue at JWNR. ACT sites are added to the COG waterbird survey. Records of species are collated and reported on.[5]

1 Latham's snipe was monitored at JWNR annually for 19 years (1984–2003) and other sites (Mulligans Flat dam, Horse Park Wetland, Bonshaw) for shorter periods by ACT Government officers (Lintermans 1987; Lintermans 1993).

2 The program that was set up by the Woodlands and Wetlands Trust to survey Latham's Snipe at Jerrabomberra Wetlands and other key sites in the ACT was announced as part of the Japanese–Australian project to monitor the migration of Latham's Snipe. The general community is also able to log sightings on web-based platforms (e.g. eBird). The survey is in partnership with COG, Friends of Jerrabomberra Wetlands, University of Canberra and the Australian Bird and Bat Banding Scheme see https://jerrabomberrawetlands.org.au/lathams-snipe-project.

3 Analysis of bird observation records has highlighted that Fyshwick Sewage Ponds provides the most signifncatn habitat for listed migratory species, especially shorebirds. ICON Water currently provides access to the Canberra Ornithologists group for ther quarterly waterbird surveys. Due to the nature of operations at the site, ICON Water is unable to allow unsupervised access to the site for bird monitoring purposes.

4 There are several surveys of waterbirds at present in nearby regional NSW (e.g. Lake George, Lake Bathurst, The Morass). For a history of the COG WBS see Lenz (2014).

5 Sources of records include: COG, ACT eBird, Canberra Nature Map, Birdlife Australia or the Atlas of Living Australia.

5.4 GOAL 4: Raise community awareness and engagement in initiatives to survey and conserve listed migratory species

The importance of information transfer to the wider community, land owners and people responsible for managing the habitat is critical. The ACT Government will continue to provide advice on species management and maintain contact with land managers.

Table 10: Key objectives, actions and indicatorsshorebirds

Objective	Action	Performance Indicator
1. Raise awareness about listed migratory shorebirds and the importance of JWNR.	Use JWNR and other wetland locations for educating the community.	Increase in the number of events at JWNR.
	Prepare online interpretative material.	Number of online interpretative materials.
2. Engage the community in awareness activities to create understanding of Horse Park Wetlands and Horse Park Drive Wetlands.	Survey the community and visitors and gain feedback from visitors for use in adaptive management plans.	Increase in the number of community survey/engagement activities.
3. Engage volunteers in programs and initiatives to maintain and restore habitat.	Support habitat restoration work undertaken by community groups.[1]	Increase in the number of participants in programs to maintain and restore habitat.

1. Community groups involved in habitat restoration for listed migratory species include the Capital Woodlands and Wetlands Trust, Friends of Jerrabomberra Wetlands, Greening Australia, ParkCare and catchment groups.

6 IMPLEMENTATION

Provisions within the NC Act require the Conservator to take reasonable steps to implement an action plan and to monitor its effectiveness. Unless otherwise specified, the actions identified within this plan are proposed to be undertaken within the life of the plan.

A progress report is required on each action plan after five years and mandatory review by the Scientific Committee is to occur at ten years. Reviews can occur earlier if needed and the Minister may extend the time for conducting a review. Minor amendments can also be made to action plans in the absence of a full review.

Implementation of this plan will require:

- land planning and management areas of the ACT Government to take into account the conservation requirements of listed migratory species both within and outside the reserve system
- adequate resourcing to undertake the specific actions identified
- collaboration with the CSIRO, universities or other research institutions to facilitate and undertake research necessary to inform management of these migratory species, including the impact of climate change
- engagement and collaboration with community groups to assist with monitoring and other on-ground actions, and to help raise awareness of conservation issues for these species.

Blackfaced Monarch. Photo: Chris Tzaros

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8 APPENDIX 1 — SPECIES PROFILES

8.1 GUIDE TO APPENDIX 1

Each species is part of a species–habitat group. 'Species–habitat' groups are a useful organising structure for this plan as the management objectives focus on protecting and managing habitats and threats to habitats.

The habitats assigned to a species–habitat group are relevant to all the species in the group, although individual species in a species group may vary significantly in the degree to which a particular habitat type is used by that species. While a species is usually found in one habitat type when it is present in the ACT, individual species have broader preferences for habitat in other regions. For example, the Double-banded Plover is usually seen in shallow water margins of freshwater wetlands in the ACT, but may also use short grass paddocks, ploughed land and airfields from time to time (Pizzey and Knight 2012). Detailed habitat preferences for each individual species are identified in the species profiles.

Critical habitat for a species or community means habitat that is critical to the survival of the species or ecological community (NC Act Dictionary). Apart from breeding habitat for the flycatchers, no habitat in the ACT is likely to meet the definition of critical habitat as a species' overall survival is not likely to depend upon protection and management of its habitat in the ACT.

For each species–habitat group a summary of threats to the group is included based on the threat database, 'SPRAT' (Department of the Environment 2015b).[7] Extra information on threats to a species documented and obtained from other local ACT sources has also been incorporated.

A detailed species profile follows the general discussion of the species–habitat group. Each species profile follows the following structure.

Conservation status

The conservation status of the species is listed by:

- international threat status as a threatened species according to the IUCN Redlist
- identification of the relevant treaty or agreement that lists the species (e.g. Bonn, CAMBA, JAMBA, ROKAMBA, see Glossary definitions)
- national threatened species status under national, state or territory legislation
- birds in the ACT, the status definitions follow COG Annotated Checklist of the Migrant Birds of the Australian Capital Territory (COG 2014a).

Species description

The description of each species includes:

- identification characteristics (profiles include a description of the size, plumage, voice and any other distinguishing characteristics)
- digital image
- breeding notes
- diet.

Habitat

A short description of the species habitat preferences.

Distribution and abundance

An account of the species former and current distribution and abundance within the ACT and region.

ACT occurrence

This section:

- identifies sites and locations important to the conservation of the species
- includes a distribution map of the species in the ACT
- provides maps and summaries of observations of the species.

Specific threats

A summary of the identified threats to the conservation of the species in Australia or locally where relevant.

7 The SPRAT database relies on information compiled for each species by the International Union for Conservation of Nature and Natural Resources (IUCN) threat classification version 1.1. The SPRAT database also summarises the known documented threat to species in Australia from Australian sources.

8.2 SWIFTS

The swifts' habitat group comprises the White-throated Needletail (*Hirundapus caudacutus*) and the Fork-tailed Swift (*Apus pacificus*).

Swifts are aerial species, mainly occurring at heights of one to 300 metres to 1000 metres or more above the ground over plains, lakes, forests, coasts and towns.

The White-throated Needletail is primarily distributed in eastern Australia and is most often recorded above forest or woodland areas. The Fork-tailed Swift mostly occurs in western and inland Australia. In the ACT, the species often occur together in flocks over the ACT. There is no discernible habitat preference between the species observed locally. The White-throated Needletail is more commonly recorded.

There are no records of either species being observed perching or resting anywhere on the ground or in vegetation in the ACT. Both species are widespread in their distribution globally and locally. No conservation reserves are actively managed for either species.

The occurrence of the birds is often associated with the arrival of cyclonic weather conditions. With climate change the frequency and intensity of cyclonic weather events in the ACT may increase and may occur more frequently.

No threats to either swift species have been formally identified under legislation in Australia (Department of Environment 2015b). Potential threats to swifts include habitat destruction and predation by cats (Felis catus) at their Northern Hemisphere breeding sites. The White-throated Needletail was formerly hunted with nets placed near their breeding cliffs in Asia. The potential impacts are regarded as negligible (Birdlife International 2007–10; Birdlife International 2009; Department of the Environment 2015b).

Fork Tailed Swift. Photo: Dean Ingwersen Birdlife Australia

White-throated Needletail (*Hirundapus caudacutus*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015)
National	Listed marine. Listed migratory: CAMBA, JAMBA, ROKAMBA (as Chaetura caudacuta)
	Non-statutory: Least Concern Action Plan for Australian Birds 2010 (Garnett et al. 2011)[1]
ACT	Uncommon, non-breeding summer migrant (COG 2014)
NSW	Not listed
Victoria	Non-statutory: Vulnerable. (Advisory List of Threatened Vertebrate Fauna in Victoria, 2013)

1 The White-throated Needletail has been nominated to be assessed as a nationally threatened species under the EPBC Act. The assessment is due to be completed by 30 March 2019. See http://www.environment.gov.au/system/files/pages/e0a90020-a411-4508-adac-53758c304de1/files/priority-assessment-list-2017.pdf

Features	Description
Size:	19–21 cm.
Wingspan:	50 cm.
Body:	The body is large, long-winged and powerful.
Plumage:	The forehead, throat and under tail coverts are white. The short dark square tail has small, extended needle-like shafts. The back is brown, fading to a whitish 'bulls-eye' in the centre of the mid-back.
Voice:	The voice is a high pitched chitter; usually heard during aerial chases.

White-throated Needletail Photo: Mick Roderick (Birdlife Australia)

White-throated Needletail (*Hirundapus caudacutus*)

Habitat

The habitat for this species includes air space over forests, woodlands, farmlands, plains, lakes, coasts and towns; feeding groups frequently patrol back and forward over favoured hilltops and timbered ranges. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy. They are less commonly recorded flying above woodland (Higgins 1999).

Behaviour and ecology

The species may appear in small groups to larger flocks during humid, unsettled, thundery weather, from near ground level to high overhead (to 2000 metres altitude in the Australian Alps). They feed aerially on flying insects; the birds streak past in long, curving rushes, with bursts of quick wing beats or fast raking glides and an audible 'swoosh' as they pass. They soar on rising currents, wings spread, tail fanned, with occasional upward flutters or downward dives after insects.

Distribution and abundance

There is no published estimate of the world population of the White-throated Needletail; however, it is not considered globally threatened (Chantler 1999).

The White-throated Needletail breeds from western Siberia, through the Himalayas and east to Japan. The breeding distribution is fragmented, with two subspecies occurring in different parts of Asia. The nominate subspecies *H.c. caudacutus* breeds from northern Japan west to central and eastern Siberia, while subspecies *H.c. nudipes* breeds from south-western China to northern Pakistan (Chantler 1999).

White-throated Needletails are regular summer migrants to eastern Australia. The species is widespread in eastern and south-eastern Australia, especially in east Queensland. It arrives in Australia from mid-October and departs by mid April. It is rare in central and western Australia, where it is outnumbered by the Fork-tailed Swift.

A decline in the area of occupancy and the extent of occurrence in eastern and south-eastern Australia was detected between 1977–81 and 1998–2002 (Barrett et al. 2003; Blakers et al. 1984), and with a high proportion of the nominate subspecies wintering in Australia, this may reflect a decline in the overall population.

ACT occurrence

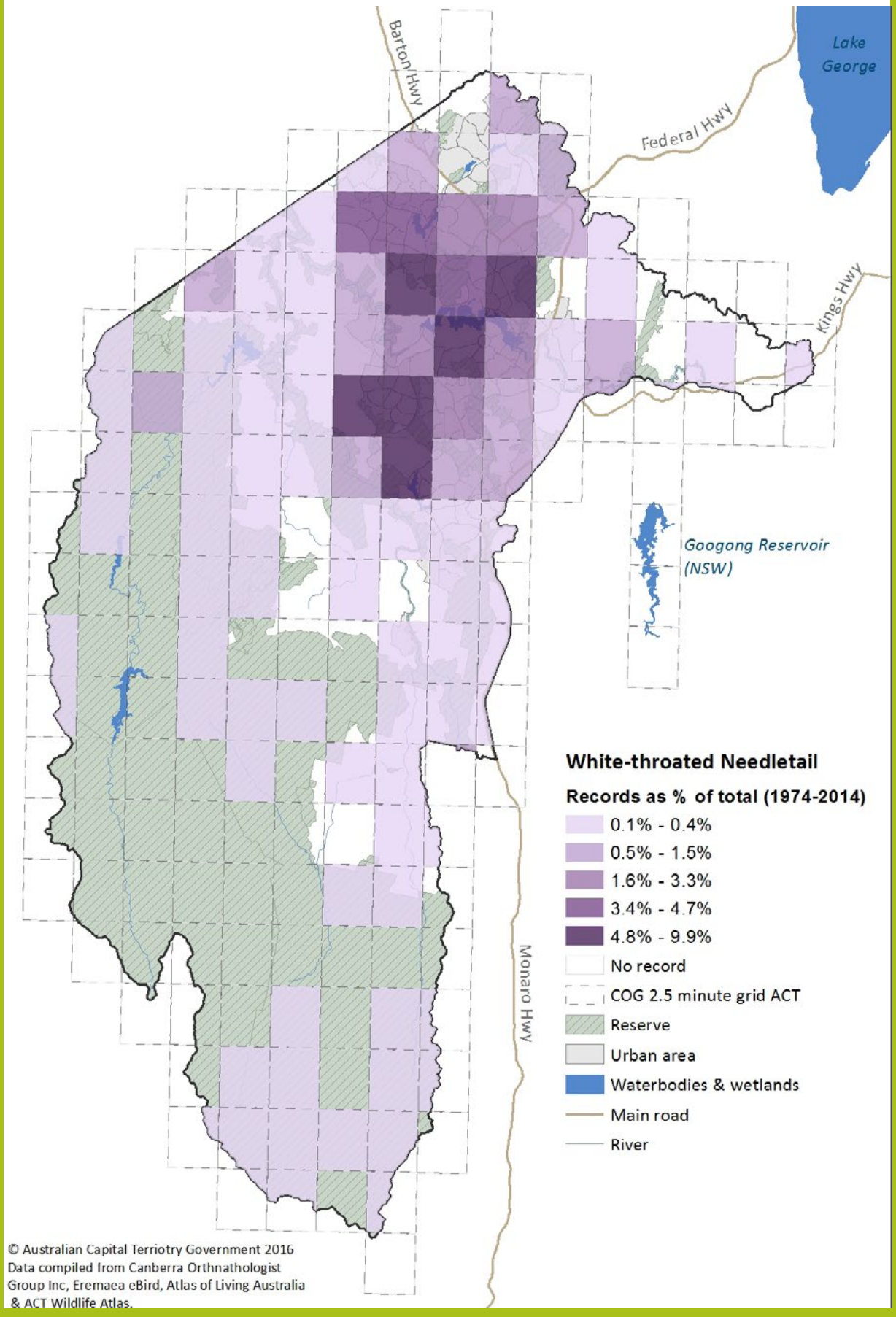
Observations of this species in the ACT are strongly associated with the occurrence of weather fronts e.g. prior to summer thunderstorms and immediately following passage of a front. Sightings are likely anywhere in the ACT. Hill-top nature reserves (NR) with an exposed outlook feature prominently in the records as follows: Cooleman Ridge NR, Namadgi National Park), Mount Ainslie NR, Mount Taylor NR, Farrer Ridge NR. Birds are mostly always observed in flight, with records of perching birds being extremely rare. Although this species is regularly reported for the ACT, reporting rates are highly variable from year to year. For example, there were 31 records in the 2012–13 financial year, 58% down on the previous year (COG 2014).

The median flock size in 2012–13 was 12, minimum 5 and maximum 50 birds. In 2013–14 there were 39 records in total. COG's abundance measure for the species in 2013–14 was 84% higher than the 30 year long-term average measure for the species, but there was a lower reporting rate: some 33% down when compared to the 30 year long-term average figure (CBN 40:1, 22). The White-throated Needletail is the most regularly occurring of the two swift species in the ACT with records of the species spanning 40 years showing it has been recorded here in 97% of years (Australian Wildlife Services 2016 *unpubl.*).

Specific threats

White-throated Needletails occasionally collide with stationary items, such as overhead wires, windows and lighthouses but this does not pose a threat to the population as a whole (Department of the Environment 2015b).

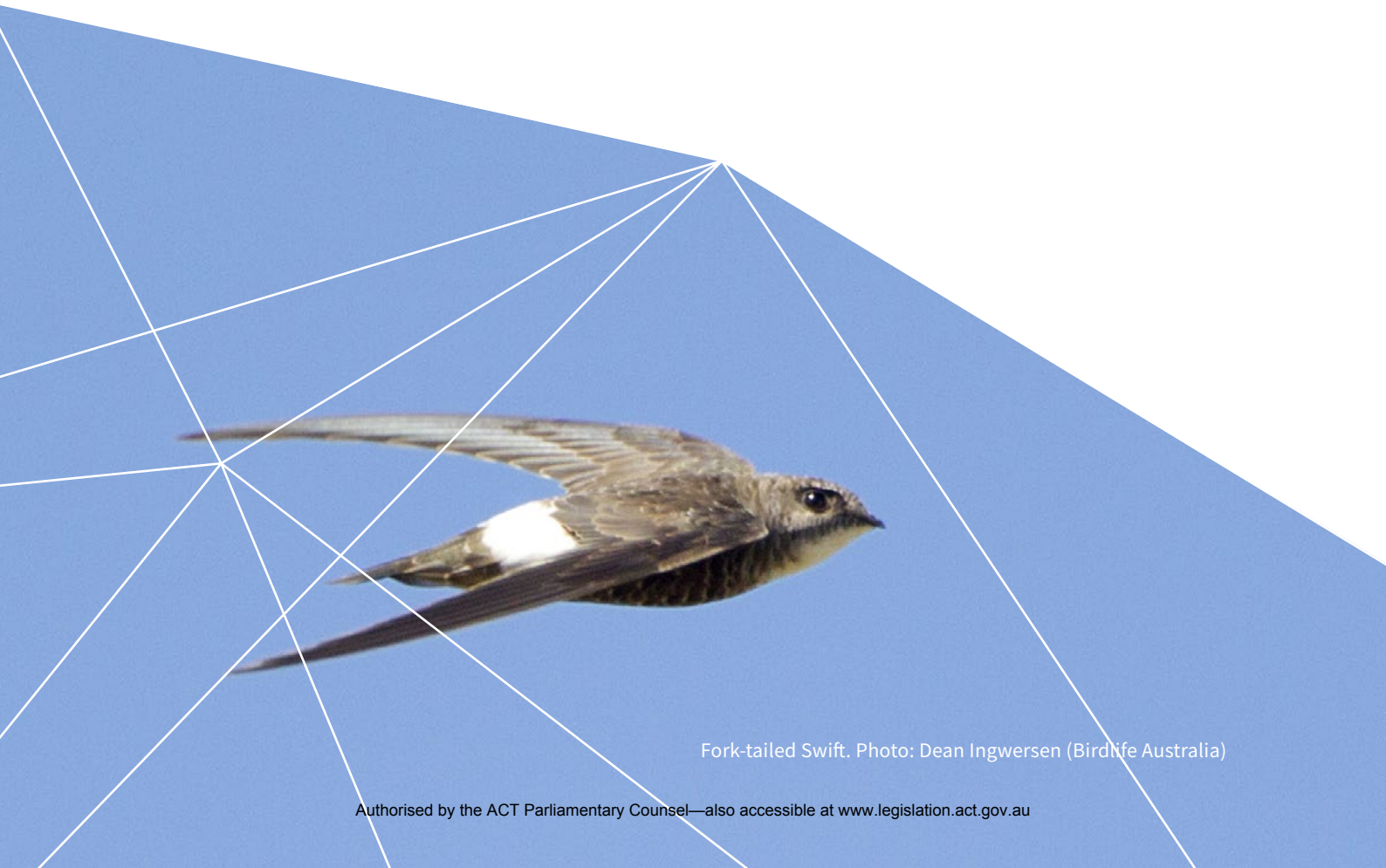
Figure 2: Recorded distribution of the White-throated Needletail *(Hirundapus caudacutus)* in the ACT



Fork-tailed Swift (*Apus pacificus*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015)
National	Listed marine. Listed migratory: CAMBA, JAMBA, ROKAMBA
	Non-statutory: Listed as Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011)
ACT	Rare, non-breeding summer migrant (COG 2014)
NSW	Not listed

Features	Description
Size:	16–19 cm.
Wingspan:	38–43 cm.
Body:	The wings are long, slender and curving. The body is cigar-shaped. The long, forked tail is often carried closed.
Plumage:	The throat is pale. The pure white rump is visible at the sides. The under parts are finely scalloped white.
Voice:	The voice is a long, high pitched 'dzeee, dzee' or 'skree-ee-ee' with twitterings and buzzing notes.



Fork-tailed Swift. Photo: Dean Ingwersen (Birdlife Australia)

Fork-tailed Swift (*Apus pacificus*)

Habitat

The species is aerial, flying over open country, from semi-deserts to coast, islands; sometimes over forests and cities. In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas, over cliffs, beaches and over islands and swell out to sea. They also occur over settled areas, including towns, urban areas and cities. They favour dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found over treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. They sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (Higgins 1999).

Behaviour and ecology

The species' movements in Australia are influenced by weather patterns. The gathering of many birds in open flocks, sometimes immense, may precede summer thunderstorms. Birds form mixed flocks with White-throated Needletails, swallows, martins and woodswallows. The species flies with gentle erratic flutters and turns and seems to roll in flight. It roosts on cliffs and in large trees, but may spend nights on the wing.

Distribution and abundance

The nominate subspecies, *Apus pacificus* pacificus, breeds in south Siberia, north Mongolia, north China and Japan. After breeding, the species migrates to South-east Asia and Australia.

The Fork-tailed Swift usually arrives in Australia around October. Large flocks often precede or follow low pressure systems as they cross the country in search of food. They are common in NSW from October–March and in the ACT from December–March, with flocks occurring three to four times a year within this time period. Most leave Australia by mid-April.

The global population is not quantified; however, populations are believed to be stable throughout most of its range, except Pakistan (del Hoyo et al. 1996). There are no overall measures of abundance of this species in Australia. The largest flocks recorded include 90,000 near Mildura, Victoria, during 1961 (Simpson 1961); 50,000 at Portland, south-west Victoria, during January 1960 (Anon. 1960); and 50,000 at Ivanhoe, NSW (Anon. 1972).

Other subspecies have different distributions. The subspecies *Apus p. kano*i is found from south-east Tibet through to south China and Taiwan. The subspecies *Apus p. leuconyx* is found in the outer Himalayas and India. The subspecies *Apus p. cooki* is found from east Burma to the Malay Peninsula.

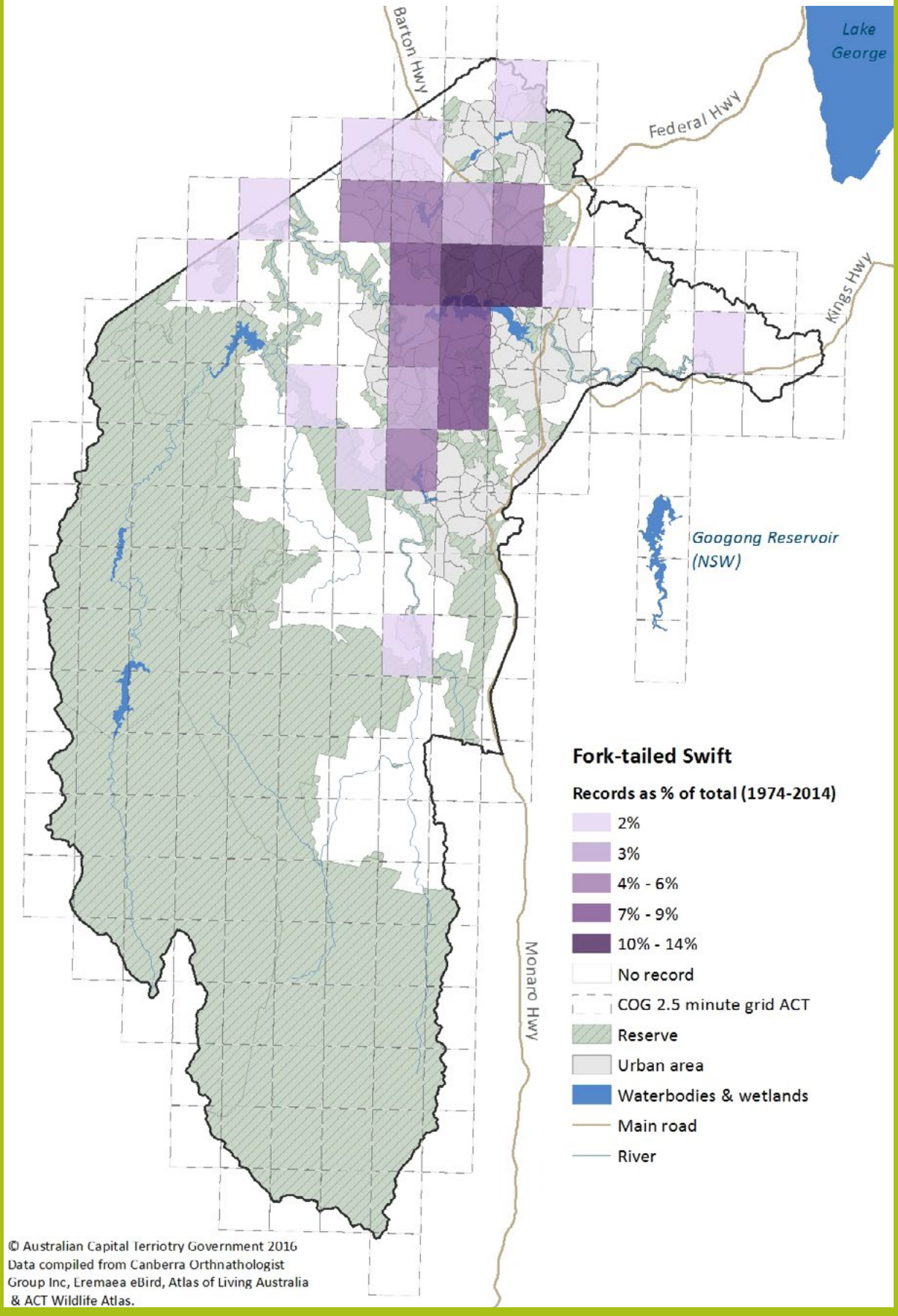
ACT occurrence

Observations of this species in the ACT are strongly associated with the occurrence of weather fronts and thunderstorms. Given the Fork-tailed Swift is strongly associated with open country in inland Australia, it is not frequently observed in the ACT. For example, during a 13-year period (June 1998 to July 2010) there were no recorded sightings of this species in the ACT.

In years when it is observed, the typical pattern of observation is for one to five records usually on one or two days. They are often seen in association with larger flocks of White-throated Needletails. For example, in 2009–10 there were six records only from four sites, all in January: 25 birds were seen at Dickson on 11 January 2009 and 11 birds were seen at Lyneham on 12 January 2009 (CBN 36:1, 12).

In the 2013–14 recording year, there were seven records, all in January and February, including a flock of 60 at Turner on 1 February 2013 (CBN 40:1, 22). The recording year 1987–88 was atypical in that greater numbers of the Fork-tailed Swift were observed than for any other year that annual COG records have been reported. There were nine recorded observations overall, including a flock of 50 in the first week of February 1988 at Kambah and a flock 55 at Ainslie, also in the first week of February 1988 (CBN 14:3, 70).

Figure 3: Recorded distribution of the Fork-tailed Swift *(Apus pacificus)* in the ACT



8.3 SHOREBIRDS

The shorebirds are the largest habitat group of listed migratory species that occur in the ACT.

Species within this species–habitat group primarily rely on coastal habitats and saline waters during their presence in Australia during the non-breeding season in the southern spring and summer each year. Twelve species regularly visit the ACT and use suitable inland fresh and saline shallow water habitats, primarily JWNR and the Fyshwick Sewage Ponds. Four species (Ruddy Turnstone, Pacific Golden Plover, Eastern Curlew and Curlew Sandpiper) are mainly coastal specialists and are only rarely recorded in the ACT. Another listed migratory shorebird species, the Buff-breasted Sandpiper (*Tryngites subruficollis*), has been recorded in the ACT region at Lake George and Lake Bathurst in 1993, 1996 and 1997 (CBN 22(Supp), 25; CBN 24:2, 72,110; CBN 24:4, 213), but not in the ACT.

In addition, there have been reported sightings of the Broad-billed Sandpiper (*Limicola falcinellus*) at Fyshwick Sewage Ponds, but these sightings were not endorsed by the COG Rarities Panel when they were submitted for peer review (CBN 4:7, 23; CBN 13:1, 11).

Primary habitat includes shallow wetland margins, river shallows, mud flats, sewage ponds and shallow lake and pond shores. The core areas of permanent wetland habitat suitable for shorebirds to rely on are restricted in area in the ACT and have only limited potential for growth. Urban lakes with constant water levels and no shallow muddy margins are not suitable shorebird habitat. Large areas of shallow wetland and mudflats occur in the ACT region at Lake Bathurst and Lake George in NSW but are subject to significant variation; Lake Bathurst is more reliable. In wet years these sites are attractive to migrant shorebird species. In dry years, only small numbers visit these sites.

Two species, Latham's Snipe (*Gallinago hardwickii*) and the Double-banded Plover (*Charadrius bicinctus*), are more widespread and use a range of additional habitats. A common element in the preferred habitat of these species is grassland whether exotic or native, mown or grazed by stock (e.g. cattle). The Double-banded Plover prefers short, bare grassland areas, ploughed ground, airfields and freshwater wetlands. Latham's Snipe uses these but also relies on periodically inundated marshy areas in rural grazing lands or permanent wetlands with vegetation cover present.

Bar-tailed Godwit. Photo: Dan Weller (Birdlife Australia)

Except for the Double-banded Plover, all species in this group migrate and breed in the Northern Hemisphere summer. The Double-banded Plover breeds in the New Zealand spring and summer. Many Double-banded Plovers migrate to Australia to spend the southern winter here.

The greatest threat to shorebirds in the East Asian–Australasian (EAA) Flyway is indirect and direct habitat loss (Melville 1997). Staging areas used during migration through eastern Asia are being lost and degraded by activities that are reclaiming the mudflats land for development or for aquaculture (Barter 2002, Ge et al. 2007). This is especially evident in the Yellow Sea, where at least 40% of intertidal areas have been reclaimed. This trend can be expected to increase in the future (Barter 2002, Ge et al. 2007). Construction of water regulation and diversion infrastructure in the major tributaries compounds these problems including water pollution (e.g. organochlorines or heavy metals discharged into the sea from industrial or urban sources). Human activities, such as fishing and aquaculture, are likely to increase significantly in the future (Barter et al. 2005; Davidson and Rothwell 1993) increasing disturbance.

Threats to shorebird habitat in Australia include:

- habitat loss through land clearing, inundation, infilling or draining
- habitat degradation: (1) loss of marine or estuarine vegetation; (2) invasion of intertidal mudflats by weeds such as cord grass; (3) water pollution and changes to the water regime; (4) changes to the hydrological regime and (5) exposure of acid sulphate soils
- disturbance, e.g. from activities including fishing, shellfish harvesting, power boating, four wheel driving, walking dogs, noise and night lighting
- direct mortality e.g. from construction of wind farms in migration or movement pathways, bird strike due to aircraft, hunting, and chemical and oil spills (DEWHA 2009).
- Global warming, with changes in sea level likely to have a long-term impact on the breeding, staging and non-breeding grounds of migratory shorebirds (Harding et al. 2007; Melville 1997).

The loss of wetlands in some regions of Australia has been severe and allocation of water from regulated river systems is an issue. Including specific habitat in a reserve or protection zone is an important step towards conserving the habitat, but does not in itself ensure an appropriate water supply (Maddock 2000). Pollution, including nutrient enrichment and industrial discharge, and inappropriate land management practices can lead to habitat degradation rendering birds more vulnerable to disease and parasites. Land reclamation, construction of barrages and stabilisation of water levels can also destroy feeding habitat. Pollution around settled areas may have reduced the availability of food (Close and Newman 1984). Intertidal habitat (the area of land exposed between the high and low tides) is likely to be severely impacted through sea level rise, impacting on shorebird habitat along coasts.

Disturbance, especially from human recreational activities, is another significant threat that has increased in recent years in Australia and which will probably continue to increase (Davidson and Rothwell 1993). This is particularly evident for the Eastern Curlew. Eastern Curlews fly away when humans approach to within 30–100 metres (Taylor and Bester 1999). Moreton Bay, Queensland, a feeding area and internationally important site for this species, is at the centre of Australia's fastest-growing region for human population (Finn et al.2001). This is a potential threat, given that the species is easily disturbed by people at feeding and roosting sites.

Formerly, Eastern Curlews were shot for food in Tasmania (Marchant and Higgins 1993). The species was hunted intensively on breeding grounds and at stopover points while on migration (Marchant and Higgins 1993).

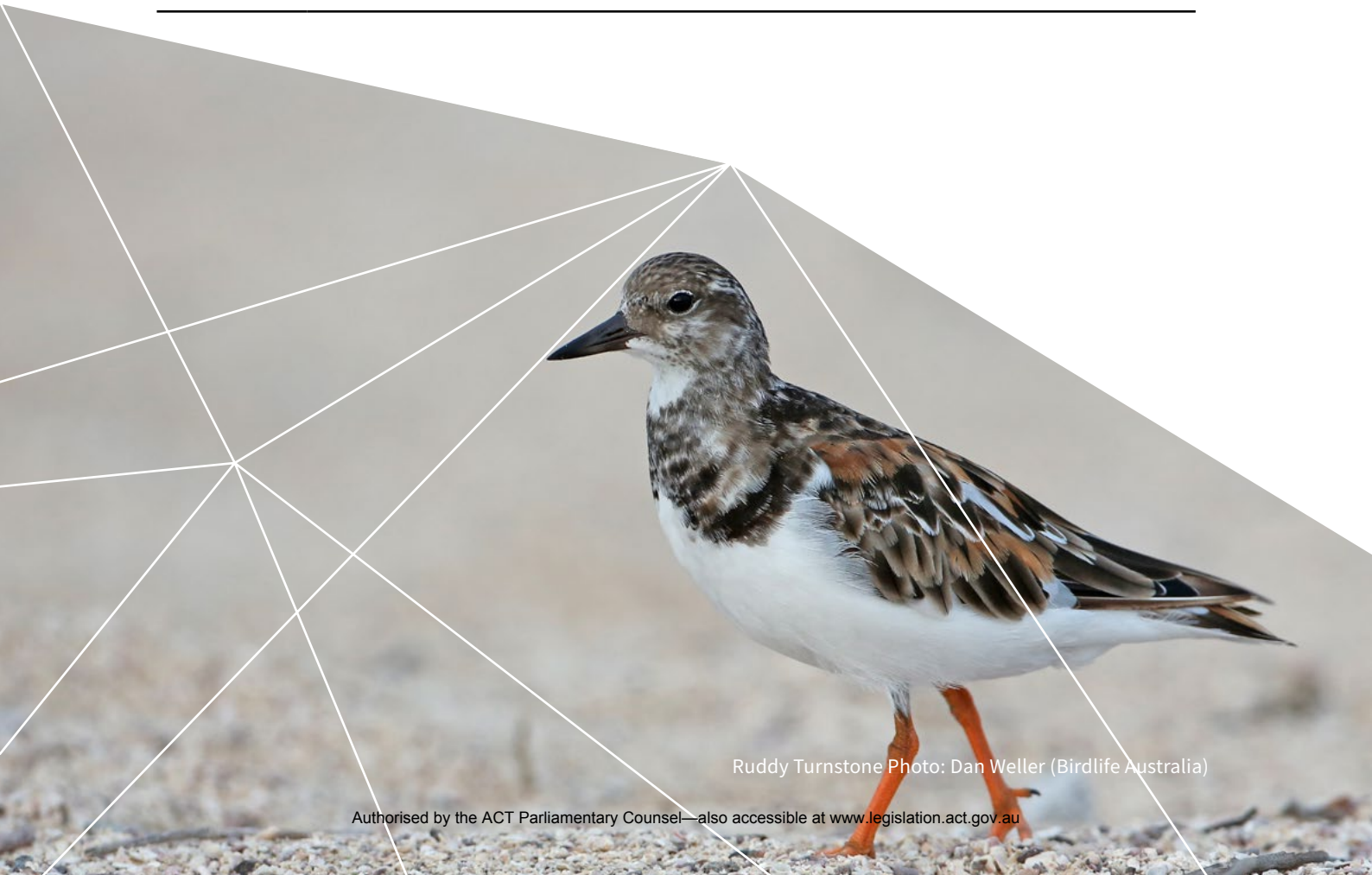
Of the 16 shorebird species visiting the ACT, 14 are a subset of the 35 species using the EEA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b). The two species not included in the Wildlife Conservation Plan are the critically endangered, Eastern Curlew (*Numenius madagascariensis*) and Curlew Sandpiper (*Calidris ferruginea*), each of which is the subject of a conservation advice prepared by the Threatened Species Scientific Committee (Australian Government 2015a, b).

The Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia 2015), The Action Plan for Australian Birds 2010 (Garnett et al. 2011) and the two conservation advice documents (Australian Government 2015a, b) contain recommended actions, primarily for the coastal zone, aimed at the conservation of these listed migratory birds within Australia.

Ruddy Turnstone (*Arenaria interpres*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015)
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA
	Non-statutory: Least Concern. The Action Plan for Australian Birds 2011 (Garnett et al.2011)
	Migratory shorebird, one of 37 species utilising the East Asian-Australasian Flyway (EAA Flyway) and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia,2015b)
ACT	Non-breeding vagrant (COG 2014)
NSW	Not listed
SA	Rare. *National Parks and Wildlife Act 1972* (SA), 2011
VIC	Non-statutory: Vulnerable (Advisory List of Threatened Vertebrate Fauna in Victoria 2013)

Features	Description
Size:	210–255 mm.
Body:	The Ruddy Turnstone is a distinctive, rather tubby shorebird with a slightly upturned short black bill and short orange legs.
Plumage Non-breeding:	Birds have a smutty grey-brown back. They have a white throat and the upper breast is smutty to blackish, cut off by white under parts. The head and breast often show signs of harlequin breeding plumage.
Breeding:	Breeding plumage shows a black-and-white harlequin pattern on the head and a black patch on the white under parts. The wings and back are a red-brown mottled black.
Voice	The voice is a guttural rattling 'kitititit'; a deep husky rattle; a 'quitta....quitta ...quit-it-it; or a ringing 'kee-oo'.



Ruddy Turnstone Photo: Dan Weller (Birdlife Australia)

Ruddy Turnstone (*Arenaria interpres*)

Habitat

The species is mostly found in coastal habitats including tidal reefs and pools; on weed-covered rocks washed by surf; pebbly, shelly and sandy shores; and mudflats. It is occasionally found inland on shallow waters; sewage ponds; commercial salt fields; and open or ploughed ground.

Behaviour and ecology

Birds are solitary or occur in small groups of other shorebirds. Birds look sturdy on the wing and they may indulge in brisk, noisy aerial chases.

Individual birds potter slowly while feeding; 'bulldozing' shells and heaps of seaweed with their bill.

The Ruddy Turnstone is carnivorous. It eats insects, worms, crustaceans, molluscs, spiders and, occasionally, fish, birds' eggs, carrion and human food scraps. In Australia in summer, their main foods are maggots and the larvae of sand-hoppers that inhabit rotting seaweed on beaches.

The Ruddy Turnstone breeds in the Northern Hemisphere. It lays two to four eggs from mid-May to early July and incubates them for about 22–27 days. The chicks are cared for by both sexes for around 19 to 21 days (del Hoyo et al. 1996).

Distribution and abundance

The Ruddy Turnstone is a cosmopolitan shorebird that breeds along coasts of the far Northern Hemisphere (Northern Siberia, Alaska) and winters widely in the Southern Hemisphere. It is a regular summer migrant to Australia from August to April, mostly to coastal Australia and Tasmania, but there are occasional records of inland populations. Some birds remain in Australia through the southern winter and may retain breeding plumage (Pizzey and Knight 2012).

The Australian population of the Ruddy Turnstone has been estimated to be 14,000 (Watkins 1993). The estimated total population that occurs in the EAA Flyway is about 30,000 birds (Australian Government Department of the Environment 2016).

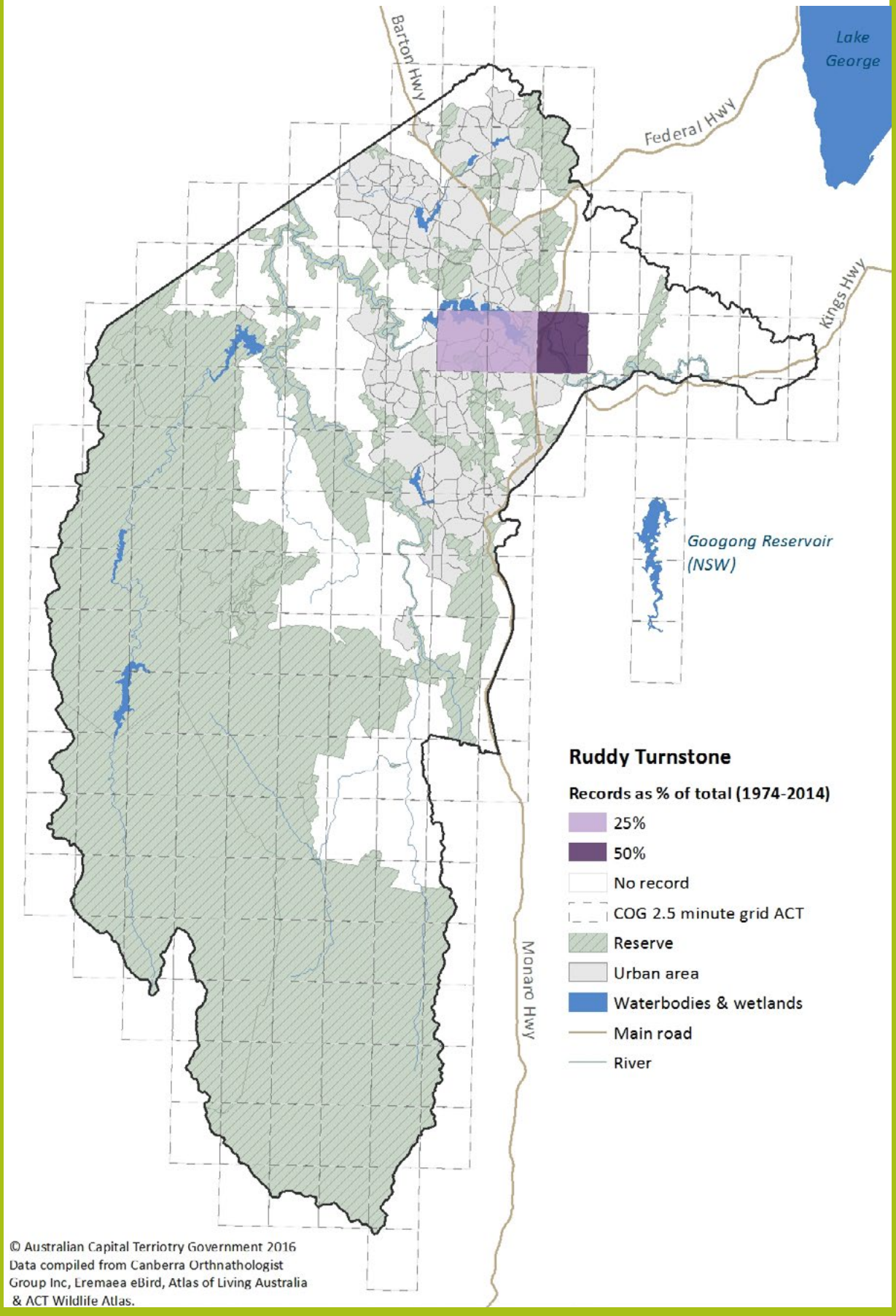
Although generally solitary, the species is very abundant in some locations in Australia such as the Great Barrier Reef islands and Roebuck Bay (WA) where flocks of 20–200 or more may occur.

ACT occurrence

The species is rarely recorded in the ACT in limited shallow water habitats at the margins of lakes, wetlands or sewage ponds such as Lake Burley Griffin or Fyshwick Sewage Ponds. There have been two published records for the ACT since 1985: one bird on 25 September 1991 at Yarralumla Bay, Lake Burley Griffin (CBN 21:4, 95) and, most recently, eight records of one bird on 13–16 October 2013 at Fyshwick Sewage Ponds (CBN 40:1, 41, ALA 2015).

A bird sighted at Lake Bathurst in NSW on 27 October 1986 was 'the second record for the Canberra area' (CBN 12:2, 58). Since 1985–86, in the ACT region in nearby NSW, there have been eight records and no more than one or two records each year when present, usually of single birds at Lake Bathurst. For example, one bird was sighted on 6 December 2000 at Lake Bathurst East Basin (CBN 26:4, 118) and two birds were sighted on 22 September 1991 at the same location (CBN 21:4, 95).

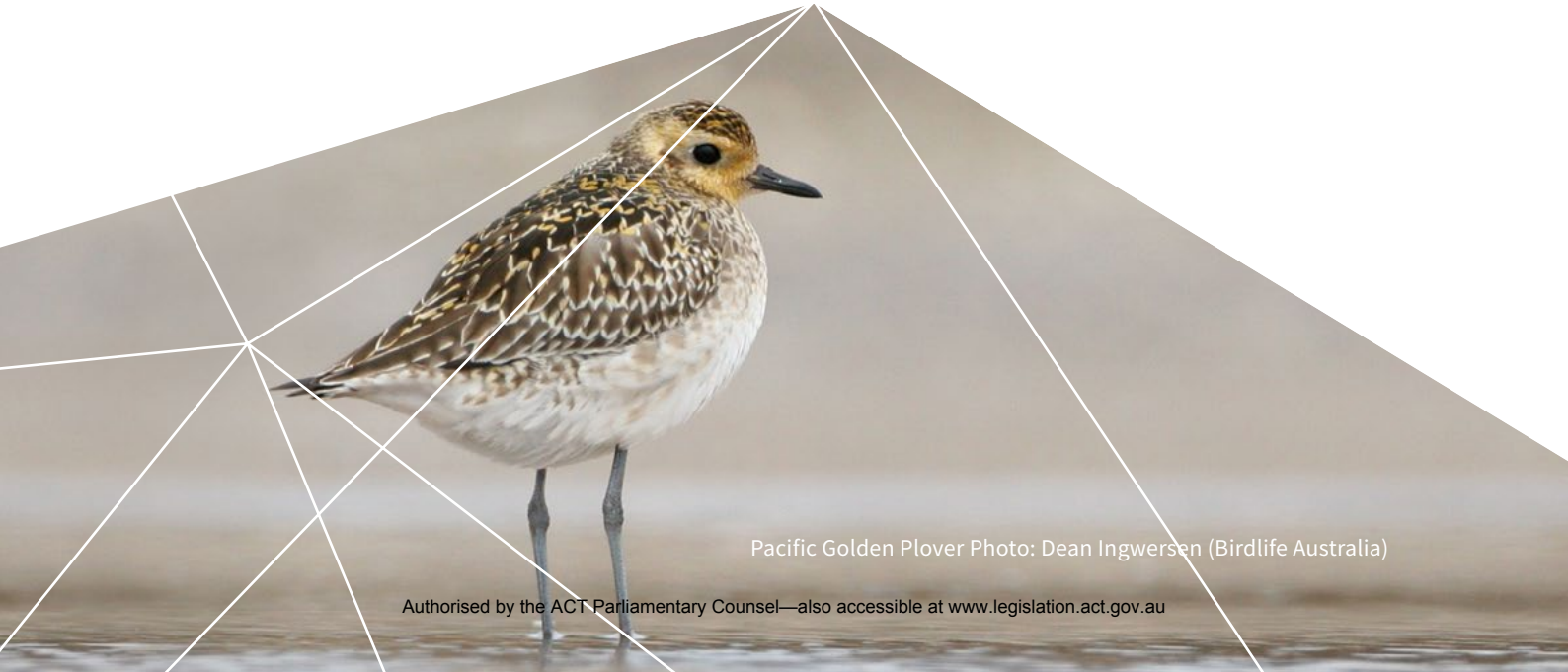
Figure 4: Recorded distribution of the Ruddy Turnstone (*Arenaria interpres*) in the ACT



Pacific Golden Plover (*Pluvialis fulva*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015)
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA
	Migratory shorebird, 37 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia 2015b)
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al.2011)
ACT	Non-breeding vagrant (COG 2014)
NSW	Not listed
SA	Rare. *National Parks and Wildlife Act 1972* (SA), 2011
VIC	Non-statutory: Vulnerable (Advisory List of Threatened Vertebrate Fauna in Victoria: 2013)

Features	Description
Size:	23–26 cm.
Wingspan:	60–72 cm.
Body:	The Pacific Golden Plover is the smallest and most delicately built of the golden plover species. It stands more upright on proportionately longer legs than the American or Eurasian Golden Plover. Its wingtips extend to just beyond the tail tip.
Plumage Non-breeding:	Birds have a pale buff forehead and face with distinct whitish to yellow-buff eyebrow. The ear-coverts and upper parts are brownish with yellow-buff spangling on the brown plumage of the crown, back, wings and tail. The breast is buff-white with or without gold or white spangles and the belly and under tail-coverts are whitish. Newly arrived birds and soon-to depart birds in moult are often patchy black on the breast.
Breeding:	Breeding birds have a black face and breast with a narrow white border extending down the flanks. The belly and under tail-coverts are white or white, blotched black.
In flight (non-breeding):	The underwing of the birds is a dusky grey-brown. The brown speckled upper parts show indistinct pale wing bar and white shafts on the primary feathers. The toes extend beyond tail tip.
Voice	The voice is a musical ‘too-weet’; a whistling ‘tlooi’; or a rough, scratchy ‘kree kree kree’ (Pizzey and Knight 2012).



Pacific Golden Plover Photo: Dean Ingwersen (Birdlife Australia)

Pacific Golden Plover (*Pluvialis fulva*)

Habitat

Habitat is mainly coastal including estuaries, intertidal mudflats, beaches, reefs, salt marshes and off-shore islands. It is rarely seen far inland. Inland habitat includes the margins of shallow, open swamps, sewage ponds, short grass paddocks, airfields and ploughed land.

Behaviour and ecology

Birds are solitary or occur in small parties and, occasionally, large flocks. They roost in areas where other species of shorebirds are present, however, usually form a separate communal group (Marchant and Higgins 1993).

During their non-breeding season in Australia, Pacific Golden Plovers mainly eat molluscs, polychaete worms, insects and insect larvae, spiders and crustaceans (Frith and Calaby 1974; Vestjens 1977). They are also said to very occasionally eat seeds, leaves, lizards, birds' eggs and small fish (Marchant and Higgins 1993). This species forages both diurnally and nocturnally, gleaning and probing moist mud or sand for invertebrate prey on mudflats, saltmarsh, in wave-wash, among tide-wrack on beaches and in pasture. They usually forage by running, then pausing briefly, and then pecking the substrate (Evans 1975; Marchant and Higgins 1993).

Pacific Golden Plovers do not breed in Australia. At breeding sites in the Northern Hemisphere, they lay their eggs in June and July (Hayman et al. 1986). Nests are usually shallow scrapes in the ground, lined with lichen or moss, and are located in dry positions in the tundra, such as on hummocks, or among lichen or moss. Clutches are usually of four eggs, which are incubated by both parents for 26 to 27 days (Department of Environment (2015b).

Distribution and abundance

The Pacific Golden Plover breeds in northern Siberia, between the Yamal Peninsula and the Chukotski Peninsula and the Gulf of Anadyr. The species also breeds in western parts of Alaska, from Cape Prince of Wales south to the Kuskowin River, including on St Lawrence and Nanivak Islands (Department of Environment (2015b).

During the non-breeding season the species is widespread in coastal areas of many parts of Asia, Australasia, Melanesia and Polynesia. In the Indian Ocean it winters along coasts from Pakistan and India east to the Malay Peninsula and western Indonesia. In eastern and South East Asia it winters from Japan, Korea and China south through the Philippines to eastern Indonesia (Department of Environment (2015b).

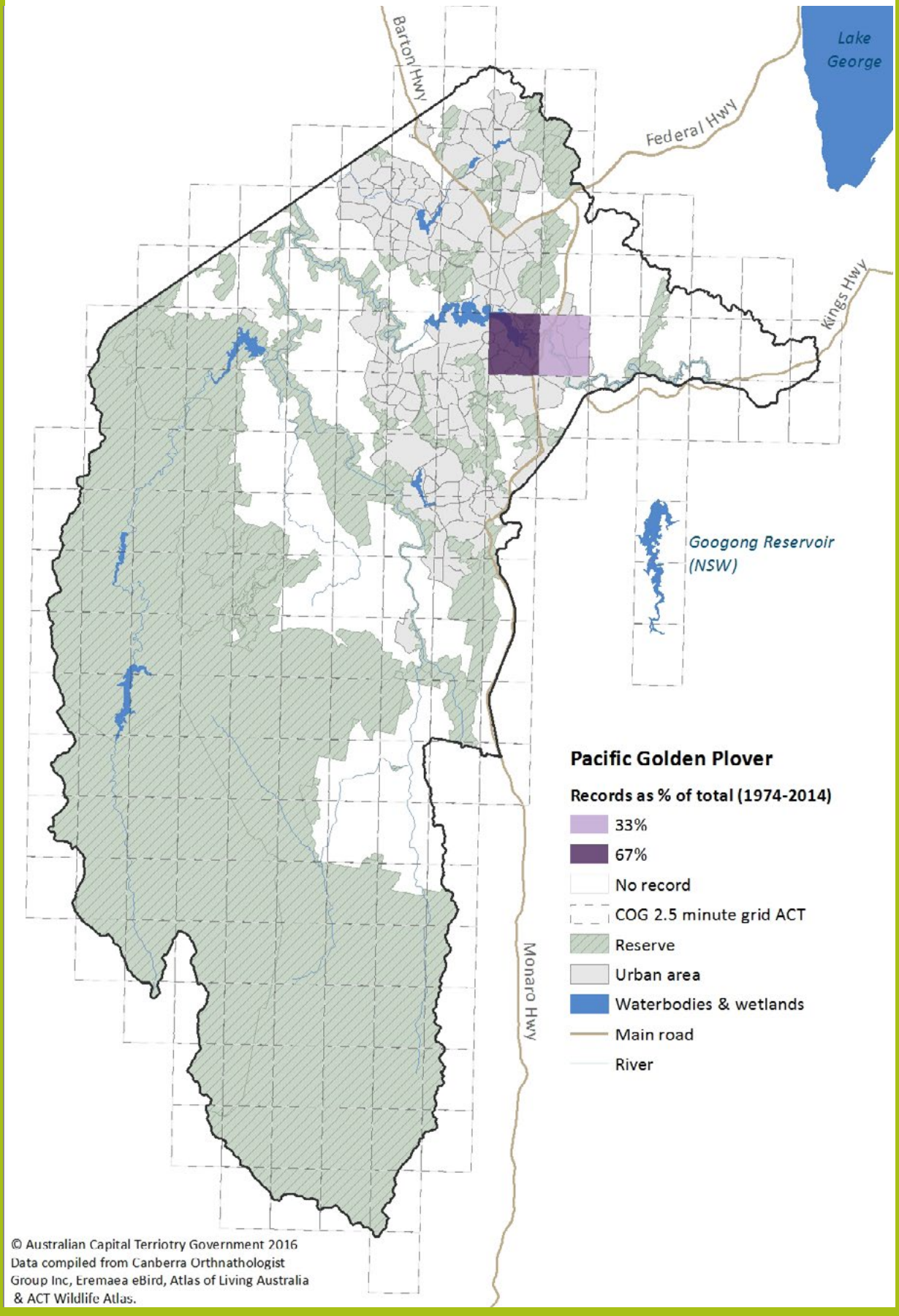
The overall trend of the population of this species is unknown. It has been estimated that about 4% of the world's population of Pacific Golden Plovers occur in Australia (9000 out of approximately 209,500) and these represent up to about 7.5% of the approximately 120,000 birds present in the EAA Flyway (Bamford et al.2008; Commonwealth Department of the Environment 2016).

ACT occurrence

There have been rarely more than one or two records of this species in the ACT and region in any year over the past decade (CBN 39:1, 35). Most recently there was one record of two birds seen by several observers on 24 November 2014 at Fyshwick Sewage Ponds (eBird, 2016) and three records of two birds on 16 November 2015 at Fyshwick Sewage Ponds (CBN 41;1, 36). Other named localities in the ACT where the Pacific Golden Plover has been observed include Lake Burley Griffin East Basin and at 'Kelly's Farm' (also referred to as Kellys Swamp, JWNR). The four birds seen at Kellys Farm on 4 November 1970 were reported as the second record of the species in the ACT (CBN No. 10, January 1971, 13).

Most records of this species in the region are from the Lake Bathurst and Lake George in nearby NSW, with one record at Lake George West on 7 January 2013 (CBN 39:1, 35) and two records at Lake Bathurst East Basin (five birds on 25 October 2015 and two birds on 30 October 2015). The largest number of records in any year was nine in 1990, all at Lake Bathurst East Basin (CBN 40:1, 38).

Figure 5: Recorded distribution of the Pacific Golden Plover *(Pluvialis fulva)* in the ACT

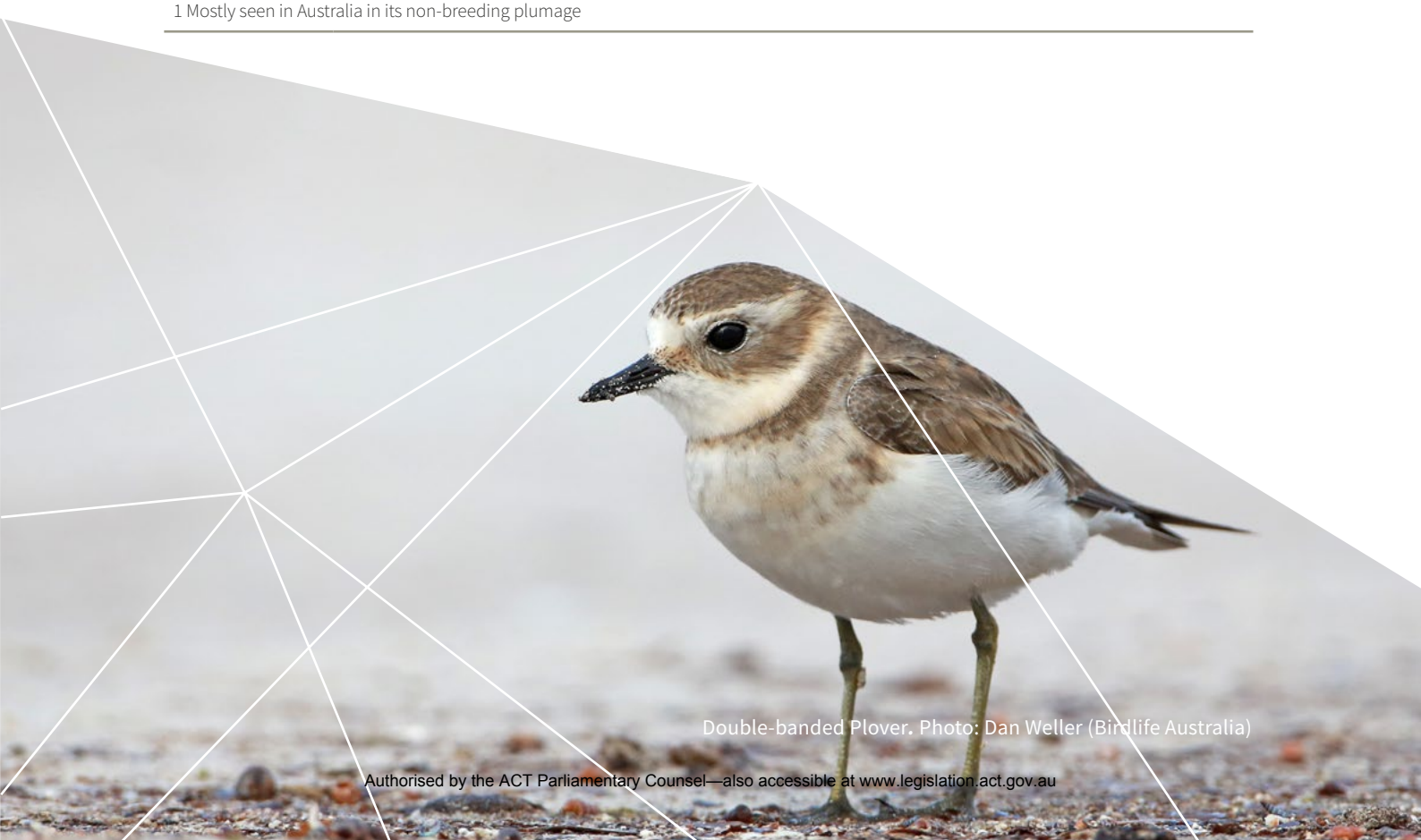


Double-banded Plover (*Charadrius bicinctus*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015)
National	Listed marine. Listed migratory: Bonn
	Non-statutory: Listed as Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
	Migratory shorebird, one of thirty-five species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia 2015b)
ACT	Non-breeding vagrant (COG 2014)
NSW	Not listed

Features	Description
Size:	17.5–19 cm.
Plumage: Non-breeding:	The head is buffish grey-brown above, with a broad brownish mark from the bill below eye, widening on ear-coverts. The forehead and eyebrow are whitish to yellow-buff, with a similar wash on the nape suggesting a rear collar. The under parts are whitish, with a slim brownish breast band at the sides of the upper breast. Some birds show traces of a chestnut lower breast band. The bill is black; the legs are dull yellow-grey or grey-green.[1]
Breeding:	Male: The forehead and under parts are white with black head markings. There is a sharp black band across the lower throat and a well-separated broad chestnut band across the breast.
	Female: The head markings and upper breast band is brown.
Juvenile:	Juvenile birds are like non-breeding adults but the facial area and collar are more yellow-buff and the upper parts have pale buff feather margins.
In flight:	A thin white wing bar and white shafts to the primary feathers are visible, as is the pale side and brownish rump and tail.
Voice	The voice is an incisive, high pitched 'pit' or a 'chip chip'.

1 Mostly seen in Australia in its non-breeding plumage



Double-banded Plover. Photo: Dan Weller (Birdlife Australia)

Double-banded Plover (*Charadrius bicinctus*)

Habitat

The species occurs on wide beaches, tidal mudflats, saltmarsh; wide, sparsely vegetated margins of shallow saline and freshwater wetlands; paddocks with sparse vegetation; ploughed fields; airfields.

Behaviour and ecology

The Double-banded Plover eats molluscs, insects, worms, crustaceans, spiders and, sometimes, seeds and fruits. The species forages on vegetated shingle beds, closely cropped pasture, tilled ground and mudflats. Double-banded Plovers are both diurnal and nocturnal. Their large eyes are used for the visual location of prey (Marchant and Higgins 1993).

Breeding occurs from September to December. Typically, the species lays three eggs, usually two to four. Nests consist of a scrape in the ground, lined with varying quantities of material such as small stones, small pieces of *Raouli, Muehlenbeckia*, lichen, moss, grass, twigs, other vegetable matter and dung (Marchant and Higgins 1993).

In Australia and New Zealand, the species is favoured by clearing of wooded lands and conversion to pasture where Double-banded Plovers regularly feed, roost and breed (Marchant and Higgins, 1993).

Distribution and abundance

The Double-banded Plover is partly migratory and dispersive. Most birds undertake long-distance migrations to northern New Zealand or south-east and south-west Australia, but others are sedentary. The nominate subspecies *C. b. bicinctus* migrates to Australia, Tasmania, Norfolk Island and Lord Howe Island. The subspecies *C. b. exilis* numbers only about 700 birds and is sedentary, making only minor movements in the vicinity of Auckland Harbour, New Zealand. Birds that breed inland or at high altitude are almost entirely migratory, probably because sources of food diminish in winter when breeding grounds above 600 metres above sea level are often covered in snow.

The estimate of the total numbers of birds migrating between Australia and New Zealand in the EAA Flyway is 19,000, based on banding studies of the breeding population rather than counts. In Australia, this species showed a decline between the Atlas surveys (20 years apart) (Barrett et al.2003; Australian Government Department of the Environment 2016).

Within Australia, the species occurs most frequently in the south-east, including inland NSW, Victoria, Tasmania and South Australia; and is casual to Cairns, Queensland and Shark Bay, Western Australia. Lake Bathurst, NSW is one of 11 sites in Australia recognised as being of international significance for the Double-banded Plover during the non-breeding season (Bamford et al.2008). Most of the other sites are in Victoria or Tasmania.

ACT occurrence

The Double-banded Plover has not commonly been reported in the ACT but has been recorded within the region at Lake Bathurst and Lake George in NSW. Recording rates at these two NSW lakes have been relatively low over the last decade compared to earlier years. Historically, the species has been observed in higher numbers at Lake Bathurst[8] than at Lake George. More recently at Lake Bathurst there have been peaks in observations in 1983–84 (16 records), 1993–94 and 1995–96 (both with 14 records). There were four records in 2013–14, including 14 birds on 3 September 2013, 67 on 26 May 2013 and 59 on 26 April 2014 at Lake George South and 107 birds on 25 May 2014 at Lake Bathurst EastBbasin.

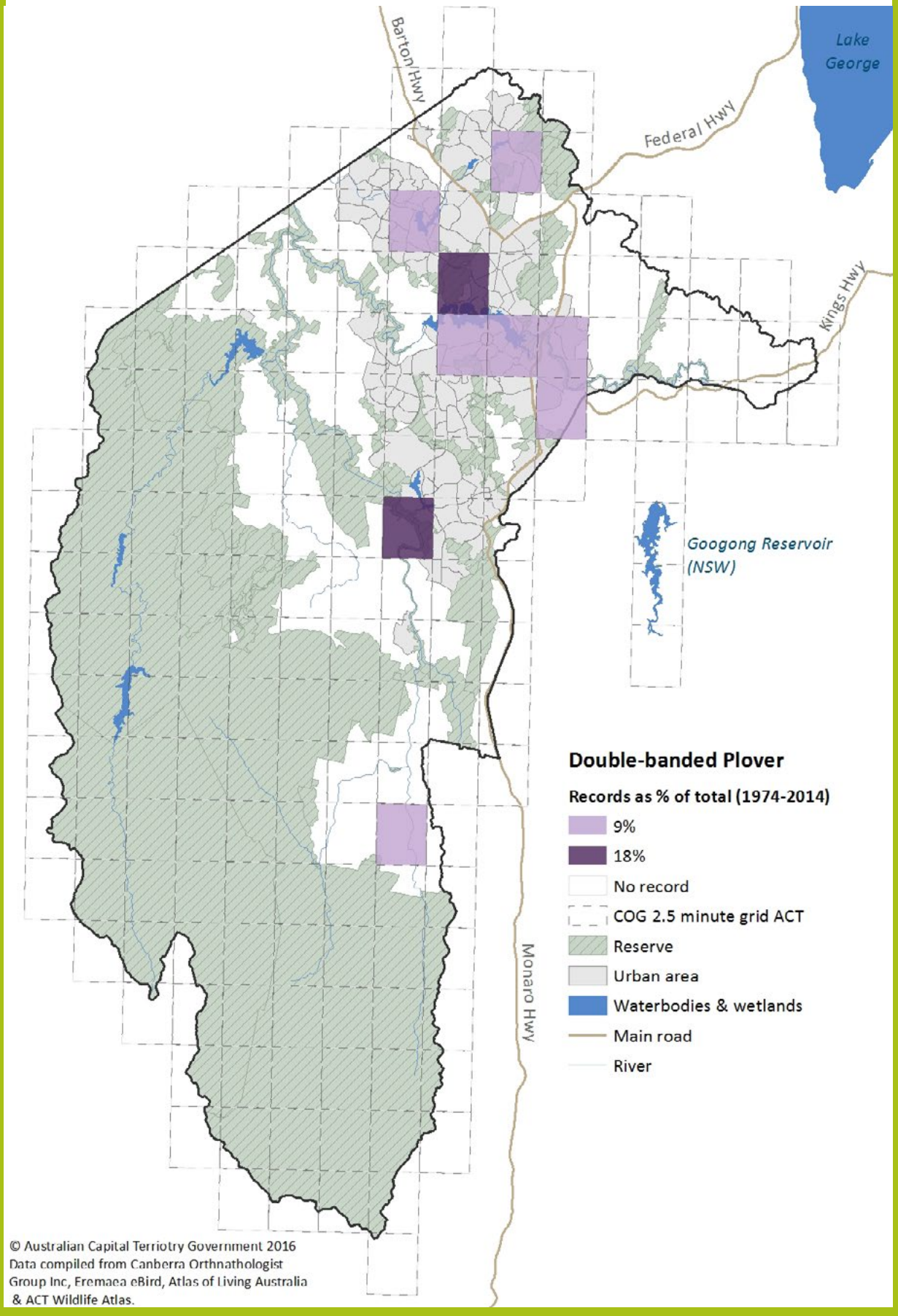
Sites in the ACT that have recorded this species include Jerrabomberra Wetlands, Fyshwick Sewage Ponds, Fyshwick Turf Farm, Mulligans Flat (dam), Lake Tuggeranong Weir, Strike-a-Light River, Murrumbidgee Golf Course and the Murrumbidgee River. The Double-banded Plover is the seventh most regular shorebird visiting the ACT, having being recorded here in 17% of years (Australian Wildlife Services 2016 *unpubl.*). The first record of the Double-banded Plover in the ACT was one bird at Fyshwick Sewage Ponds on 15 March 1971 (D'Andria, 1971) followed by three birds at Lake Tuggeranong Weir on 1 March 1980 (Holland 1971). Prior to 2000 in the ACT and region there were 5–15 records every year, but since 2001 the number of records per year has been less than five with four years recording no birds (CBN 40:1, 39).

Specific threats

The most significant identified threat to Double-banded Plovers while wintering in Australia is the cessation of grazing. At least three important wintering sites in Victoria have been rendered unsuitable in the last 20 years by the cessation of grazing. In New Zealand, the conversion of a bare pumice nesting ground to a golf course is thought to have caused local extinction at one site. Flood mitigation and planting of willows (Salix spp.) have decreased the amount of available nesting habitat in New Zealand (Marchant and Higgins 1993).

8 Clayton (1971) reported the species was present 'in thousands' at Lake Bathurst on 26 June 1971.

Figure 6: Recorded distribution of the Double-banded Plover (*Charadrius bicinctus*) in the ACT



Latham's Snipe (*Gallinago hardwickii*)

Location	Conservation status
International	Least Concern (IUCN Red List of Threatened Species 2015)
National	Listed marine. Listed migratory: Bonn, JAMBA, ROKAMBA
	Non-statutory: Least Concern. The Action Plan for Australian Birds 2010 (Garnett et al.2011)
ACT	Common, non-breeding summer migrant (COG 2014)
NSW	Not listed
SA	Rare. *National Parks and Wildlife Act 1972* (SA): 2011
VIC	Non-statutory: Near Threatened. (Advisory List of Threatened Vertebrate Fauna, Victoria 2013)

Features	Description
Size:	28–31 cm.
Weight	190 grams.
Body:	The body is long at around 7.5 cm. The bill is straight and birds have a large black eye which is set high in the head. It has a long bill and conspicuous white belly.
Plumage:	The body is an intricately marked; rufous, black and buff, with bold brown stripes and cream streaks. The flanks are barred and the belly and under parts are whitish.
Voice	When flushed, the voice is a quick, explosive 'chak!' or a 'zhak', like the sudden tearing of sandpaper.

Latham's Snipe. Photo: Andrew Silcocks (Birdlife Australia)

Latham's Snipe (*Gallinago hardwickii*)

Habitat

Latham's Snipe prefers freshwater, soft wet and waterlogged ground or shallow water with tussocks and other green or dead growth; wet parts of paddocks, seepage below dams; irrigated areas; scrub or open woodland from sea level to open bogs over 2000 metres; 'samphire' on saltmarshes; and mangrove fringes (Pizzey and Knight 2012). Preferred habitat is dominated by Water Couch (*Paspalum paspaloides*), fat hen (*Chenopodium spp.*) and *Ranunculus sp*. The secondary habitat is marshy ground dominated by low growing Juncus sp.and generally wet all year round where regular overflow occurs.

Their opportunistic dispersal allows them to use temporary muddy areas in wetlands, drying ditches, roadside ditches and sewage ponds (Frith et al. 1977; Naarding 1986; Parker 2015 *unpubl*.).

Behaviour and ecology

The birds are seen in small parties and occasional large companies. They are difficult to see in their preferred habitat and usually remain undetected until they are flushed by the observer.

Latham's Snipe is an omnivorous species that feeds on seeds and other plant material (mainly from species in families such as *Cyperaceae, Poaceae, Juncaceae, Polygonaceae, Ranunculaceae* and *Fabaceae*) and on invertebrates including insects (mainly flies and beetles), earthworms, spiders and, occasionally, molluscs, isopods and centipedes. Latham's Snipe forage during the day, or at night. They use their bills to jab and probe into mud that may be exposed or covered by very shallow water (Frith et al. 1977).

Latham's Snipe roost on the ground near, or sometimes in, their foraging areas; usually in sites that provide some degree of shelter, such as: beside or under clumps of vegetation; among dense tea-tree; in forests; in drainage ditches or plough marks; among boulders; or in shallow water if cover is unavailable (Frith et al. 1977).

Banding data indicates that birds are capable of surviving for more than four years. The age of sexual maturity is unknown, but birds probably breed for the first time at one or two years of age (Frith et al.1977).

Distribution and abundance

Latham's Snipe does not breed within Australia. The breeding range is confined to northern Japan (Hokkaido and Honshu), Kurile Islands and Sakhalin Island and in far eastern Russia (Higgins and Davies 1996; Naarding 1986). Latham's Snipe migrate south after the breeding season, travelling across Papua New Guinea to winter in eastern Australia (del Hoyo et al. 1996; Higgins and Davies 1996; Naarding 1986).

Latham's Snipe is a non-breeding visitor to south-eastern Australia; migrating through northern Australia (Higgins and Davies 1996). The species has been recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia (including the Adelaide plains; Mount Lofty Ranges; and the Eyre Peninsula). The range extends inland over the eastern tablelands in south-eastern Queensland (and occasionally from Rockhampton in the north) and to west of the Great Dividing Range in NSW (Barrett et al. 2003; Blakers et al. 1984; Frith et al. 1977). The species is widespread in Tasmania (Barrett et al. 2003) and is found in all regions of Victoria except for the north-west (Barrett et al.2003; Blakers et al1984; Emison et al.1987). There are no historical records of any changes in the extent of occurrence, estimated at 3 millon km^2 (Garnett and Crowley 2000).

The global population of Latham's Snipe is estimated at 30,000 birds, which is the same population size estimated to visit eastern Australia each year since no birds have been detected elsewhere during the non-breeding season (Wetlands International 2002).

The numbers of Latham's Snipe that migrate to Australia each year have been stable over the past 30 years (Garnett and Crowley 2000). For example, a comparison of species records collected from 1977 to 1981 (published in Blakers et al.1984) and from 1998 to 2001 (published in Barrett et al.2003) shows there was no overall change in the reporting rate between the two sampling periods (Barrett et al.2002).

Latham's Snipe (*Gallinago hardwickii*)

ACT occurrence

Latham's Snipe is the most regularly recorded shorebird species in the ACT, having been reported each year for the last 40 years (Australian Wildlife Services 2016 *unpubl.*). Although it is a cryptic species and somewhat difficult to observe at most times, it is a relatively large species which can be readily surveyed through flushing its preferred habitat. A joint project with the Woodlands and Wetlands Trust is tracking Japanese Snipe to more fully understand their distribution across the ACT.

Latham's Snipe usually arrive in the ACT in the second half of August and remain until February–March. Latham's Snipe regularly visit a broad range of suitable, marshy areas with vegetative cover present and, more widely, wherever there is suitable habitat present e.g. on temporary wet and flooded ground.

The number of ACT records is variable from year to year, ranging from less than 10 to more than 50 a year. In recent years there has been a significant increase in the number and geographic spread of records (e.g. COG's reporting rate increased 154% for 2012–13 compared to 2011–12 (CBN 39:1, 38). In 2013–14 this trend was confirmed with a similar number of records (216) to 2012–13 but with a broader geographic spread. There were 14 records of 10 birds or more, of which 12 records were from JWNR (CBN 40:1, 38). However, there was a decline in abundance and reporting rate in 2014–15 compared with 2013–14 (CBN 41:1, 38).

They are most commonly seen at JWNR at Kellys Swamp and Jerrabomberra Backwaters (57% of all records) where up to 20 birds may sometimes be seen on a single visit. However, there are many other lowland locations, mainly in the north-east of the ACT, where Latham's Snipe have been recorded. In decreasing frequency these sites include: West Belconnen Pond; Giralang Pond (Dodswell Street); Lake Burley Griffin West (Scrivener Dam); JWNR (Jerrabomberra Reach); Mulligans Flat NR; JWNR (Jerrabomberra Pool); Forde Lower Pond; Fyshwick Sewage Ponds; Lake Burley Griffin West (Yarralumla Reach); Lake Burley Griffin East Basin; Horse Park Wetland; Mulligans Flat Dam; Urriara Station Dam; Lake Burley Griffin West (Acton); Mckellar Wetlands (Heney Close) and Tom Nicholas Street Urban Pond (Forde).

Other sites, comprising 12% of observations, include: Lake Burley Griffin (Acacia Inlet, Creek, Pine Island); Lake Tuggeranong; Lake Ginninderra; Yerrabi Pond; Valley Avenue Ponds; Dunlop West Pond; Flemington Road Ponds; North Watson Wetland; Ginninderra Creek (West Macgregor); Dunlop and Forde Grasslands; Gundaroo Road; Goorooyarroo NR; Callum Brae NR; Paddys River; Parkwood; 'Gungahlin'; 'Brindabella' and 'Lanyon' homesteads; Birrigai; Nursery Swamp; the upper reaches of the Naas River and at altitude at Ginini Flats (1600 metres), part of the Ginini Flats Wetlands Complex Ramsar site. There are also several suburban records: Norgrove Park; Harrison District Playing Fields; Bonner (eBird 2016); Ngunnawal (CBN 28:4, 140); Curtin (CBN 31:1, 17); Chapman (CBN 31:1, 18).

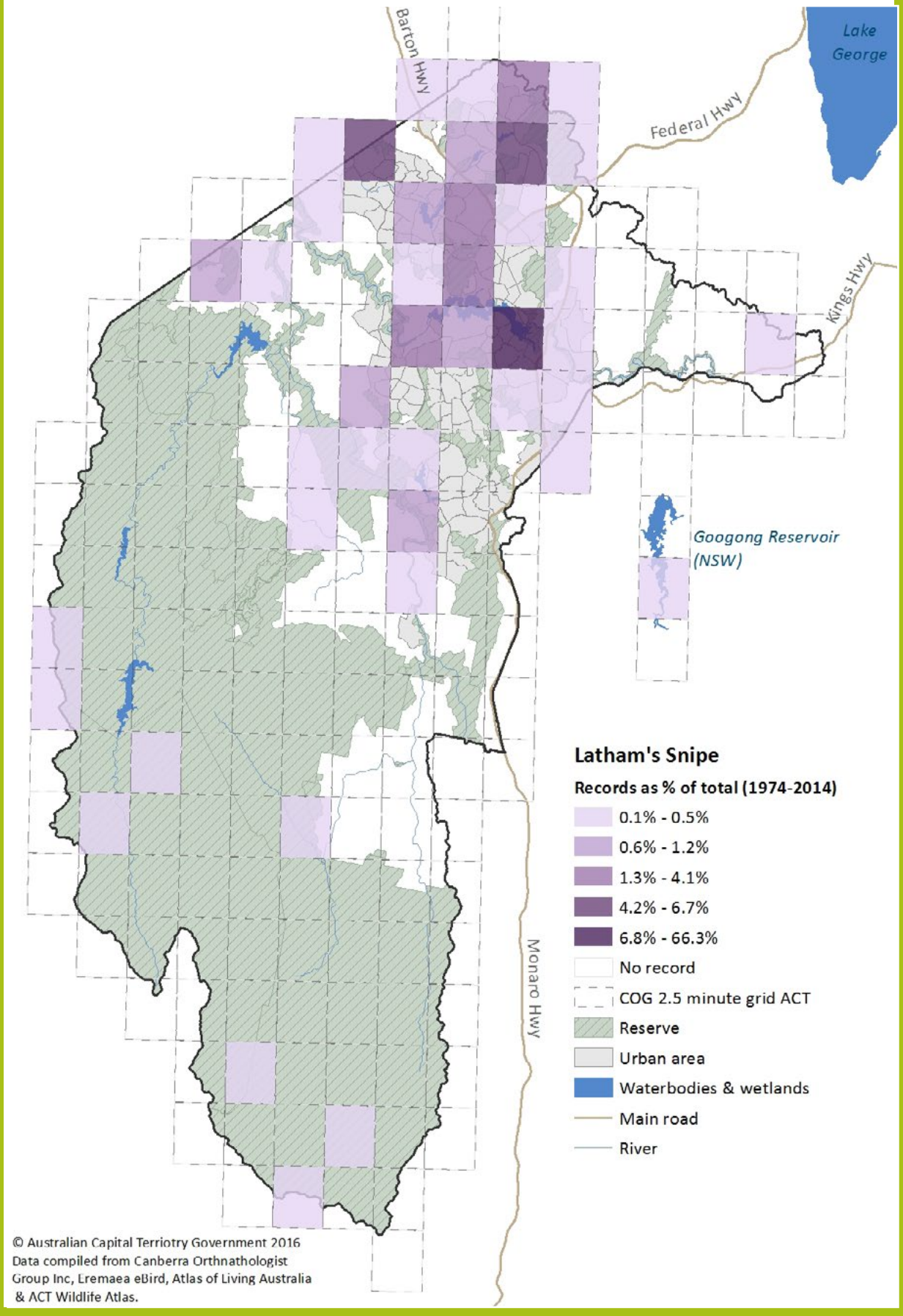
Specific threats

Historically, the greatest threats to Latham's Snipe in Australia have been a loss of habitat caused by the drainage and modification of wetlands, and excessive mortality due to hunting (Frith et al. 1977; Naarding 1986). The loss of habitat in Australia has been extensive; many of the wetlands traditionally occupied by snipe have been drained or modified (Frith et al. 1977). The species was formerly hunted, legally, in all states in eastern Australia. It has been estimated that up to 10,000 birds (including 6000 birds in Victoria and 1000 birds in Tasmania) were killed annually by hunters before bans on shooting were introduced in NSW (1976), Tasmania (1983) and Victoria (1984).

The current major threat to the species appears to be the ongoing loss of habitat. The wetland habitats occupied by Latham's Snipe are threatened by a variety of processes including: drainage; diversion of water for storage or agriculture; development of land for urban or other purposes; and land management practices such as mowing of habitat during summer, which can render it unsuitable for several months (Frith et al. 1977; Garnett and Crowley 2000).

The birds are easily disturbed by the intrusion of humans or cattle into their habitats, but some populations occupy wetlands that are prone to disturbance, e.g. near industrial complexes, roads or railways, airfields and within school grounds (Higgins and Davies 1996). The pollution of wetlands (through nutrient enrichment, industrial discharge or inappropriate land management practices) and the salinisation of wetlands are potential threats to snipe (Melville 1997), but no information is available on the impact of pollution or salinisation upon snipe populations.

Figure 7: Recorded distribution of Latham's Snipe (*Gallinago hardwickii*) in the ACT



Bar-tailed Godwit *(Limosa lapponica baueri)*

Location	Conservation status
International	Listed as Least Concern as L. lapponica (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Vulnerable. Environment Protection and Biodiversity Conservation Act 1999 (Cth.)[1]
	Migratory shorebird, one of thirty-five species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Listed as Vulnerable. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
SA	Rare. *National Parks and Wildlife Act 1972* (SA), June 2011.
NT	Vulnerable. *Territory Parks and Wildlife Conservation Act 2000* (NT), 2012.
WA	Vulnerable. *Wildlife Conservation Act 1950* (WA), December 2014.

1 Another subspecies, L .l. menzbieri, is listed as Critically Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth.)

Features	Description
Size:	380–455 mm.
Body:	A large, pale brown, streaked wader with a conspicuously long, slightly upturned bill.
Plumage Breeding:	Male: head and body orange-rufous or brick red, upper parts richly pattered black and buff. Female: head and body deep buff.
Non-breeding:	Pale grey-brown above, streaked and mottled brown, with a fawn eyebrow. Pale below. Dark streaks on neck and upper breast.
Voice	The voice is a staccato, muted but rather scratchy 'ketta-ket'; or a softer 'kit-kit,-kit-kit'.

Bar-tailed Godwit Photo: Dan Weller (Birdlife Australia)

Bar-tailed Godwit *(Limosa lapponica baueri)*

Habitat

The species occurs on tidal mudflats, estuaries, sewage ponds, shallow river margins, brackish or saline inland lakes, and flooded pastures (Pizzey and Knight, 2012). It has been sighted in brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is sometimes found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips (Department of Environment, 2015b). Birds may roost in mangroves.

Behaviour and Ecology

Birds are seen singly or in small parties, or flocks, spread out widely over mudflats while feeding. Birds fly swiftly in staggered lines or chevrons, low to water.

The Bar-tailed Godwit is mainly carnivorous with a diet consisting of worms, molluscs, crustaceans, insects and some plant material. It has also been recorded eating fruits, fish and tadpoles. While it is in breeding grounds it eats mainly ground dwelling insects (Marchant and Higgins 1993). The Bar-tailed Godwit usually forages near the edge of water or in shallow water, mainly in tidal estuaries and harbours.

The Bar-tailed Godwit breeds in the Northern Hemisphere summer. Birds nest on the ground, usually on dry elevated sites, often between clumps of grass in a depression lined with bits of vegetation and lichens. The Bar-tailed Godwit is solitary nester, but nests may be grouped together. Egg laying occurs from late May through June. They lay two to five eggs, incubate for 20–21 days, and have a nestling period of 28 days. They may breed from two years of age and the annual mortality is about 40% (del Hoyo et al. 1996).

Distribution and Abundance

The Bar-tailed Godwit is polytypic meaning more than one subspecies exists (Marchant and Higgins 1993). The nominate subspecies *L. l. lapponica* breeds in northern Eurasia including Lapland. *L. l. baueri* breeds in northeast Siberia and north-west Alaska and winters in Indonesia, New Guinea, east Australia, New Zealand and Pacific islands. *L. l. menzbieri* breeds in central Siberia, and occurs in Western Australia.

The species has been recorded predominantly in suitable coastal habitats of all Australian states. It is widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW and Victoria, including the offshore islands. It is found south from Cooktown to Port Phillip Bay, but is less common west of the Bellarine Peninsula. There are a few inland records from NSW and Victoria. The species is occasionally recorded at King Island and the Furneaux Group, with scattered records on the north and east coasts of Tasmania.

The most recent estimate of the Bar-tailed Godwit population was between 1,060,000 and 1,110,000. An estimated 325,000 Bar-tailed Godwits occupy the EAA Flyway. During the non-breeding season 88% of the EAA Flyway population occurs in Australia and New Zealand (Bamford et al.2008). The two subspecies that make up the Flyway population are *L. l. baueri* (155 000) and *L. l. menzbieri* (170 000).

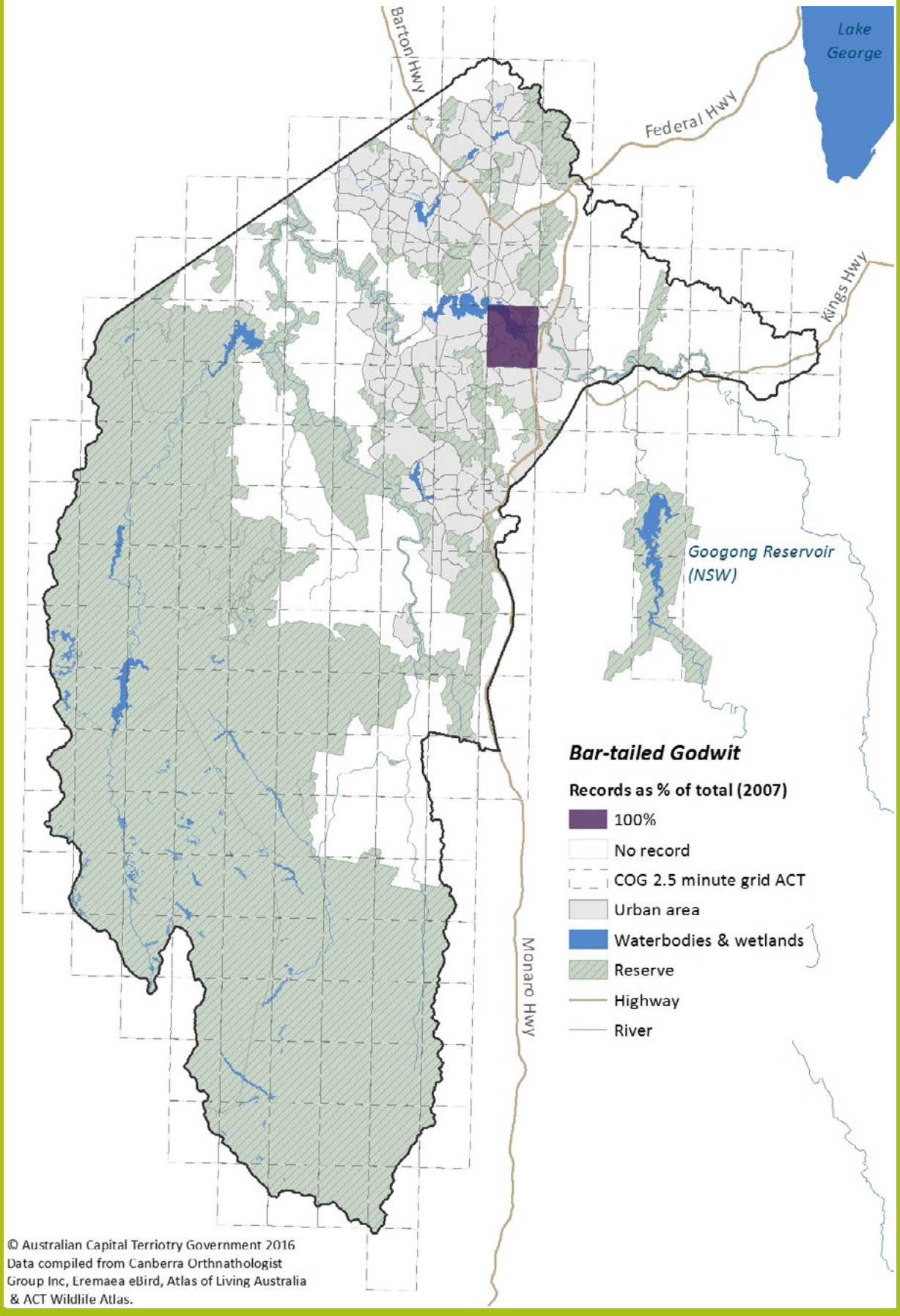
ACT occurrence

The Bar–tailed Godwit is only very rarely recorded in the ACT and region due to this species' primary reliance on coastal habitats in Australia. The species is usually recorded as a single bird utilising the available, but very limited shallow water habitats at the margins of lakes or wetlands (e.g. JWNR (Kellys Swamp, Jerrabomberra Pool, Shoveler Pool) and Lake Burley Griffin). The first published record of this species in the ACT is at Jerrabomberra Creek on 17 December 1972 (McNoughton, 1972). Then follow two separate records of single birds seen on Lake Burley Griffin's shoreline at the ANU and at Exhibition Point on 19 and 26 November 1979, respectively (Mason 1979, Pfanner 1979). Several observers recorded a single bird at Jerrabomberra Wetlands over several days from 25–28 October 2007 (seven records at Kellys Swamp; one record at Jerrabomberra Pool and one at Shoveler Pond). The 'Field List of the Birds of Canberra and District' (Second Edition, 1971) records a sighting at Lake Bathurst in NSW in 1962 and that in 1971 the species had not yet been observed in the ACT. More recently, there are three records of a single bird reported between 31 October and 21 November 2011 at Lake Bathurst, NSW (COG 2013). There is a record of a single bird on 14 October 2014 at Lake Bathurst (CBN 14:1, 38).

Specific Threats

The Bar-tailed Godwit is mainly a coastal species utilising tidal mudflat and estuaries; but also regularly travels inland in Australia and can be found in small numbers at brackish and saline inland lakes, with some over-wintering of young birds occurring. The species' numbers have significantly reduced in recent years throughout its range in Australia, hence the recent classification of the eastern Australia subspecies as vulnerable (EPBC Act).

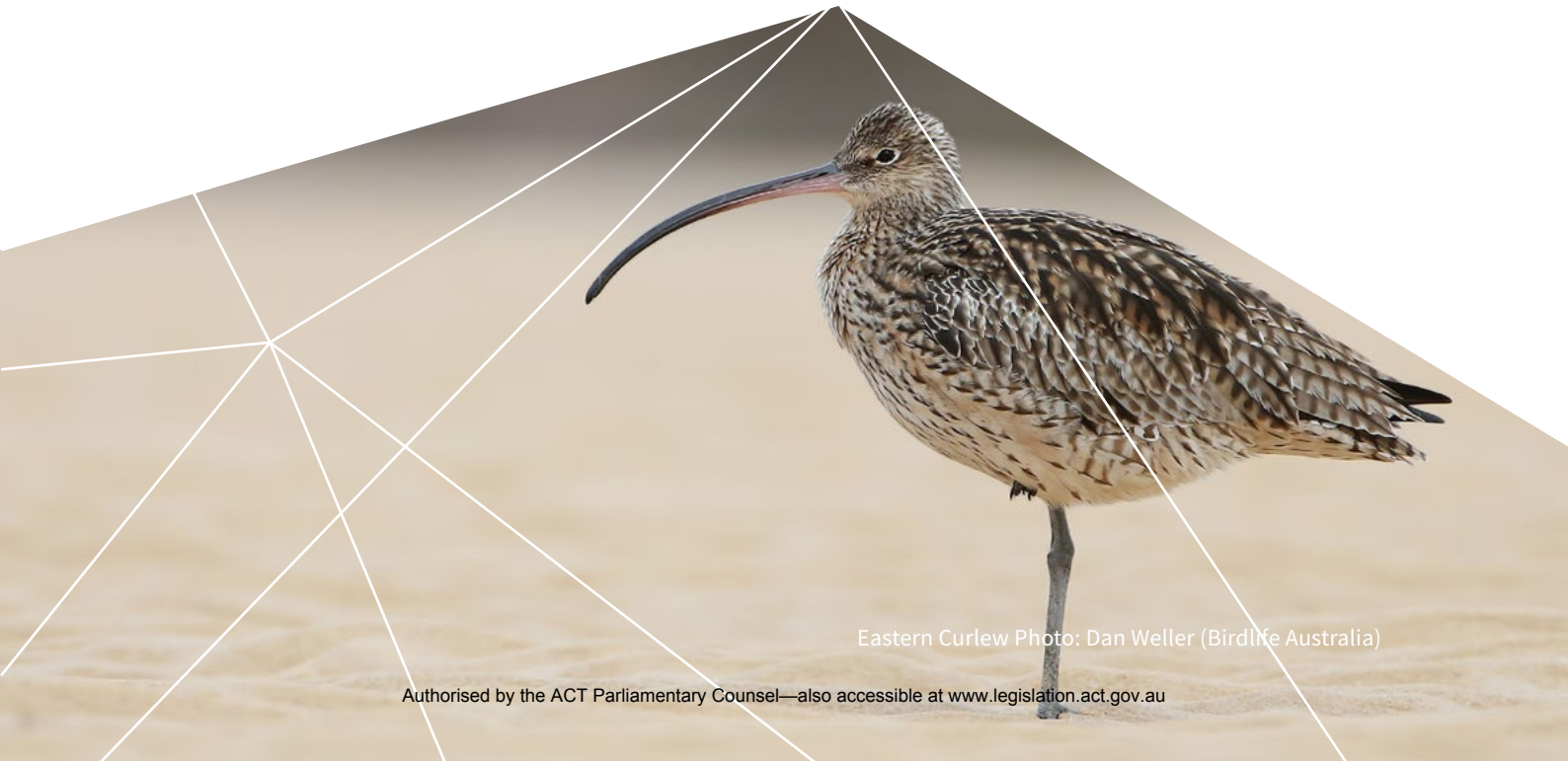
Figure 8: Recorded distribution of Bar-tailed Godwit *(Limosa lapponica baueri*) in the ACT



Eastern Curlew *(Numenius madagascariensis)*

Location	Conservation status
International	Listed as Endangered (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Critically Endangered. Environment Protection and Biodiversity Conservation Act 1999 (Cth.)
	A conservation advice has been prepared and approved (Australian Government 2015a)
	Non-statutory: Vulnerable. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
VIC	Non-statutory: Vulnerable. (Advisory List of Threatened Vertebrate Fauna in Victoria: 2013)
SA	Vulnerable. *National Parks and Wildlife Act 1972* (SA), June 2011.
TAS	Endangered. *Threatened Species Protection Act 1995* (Tas): April 2016.
QLD	Vulnerable. *Nature Conservation Act 1992* (Q): August 2015.
NT	Vulnerable. *Territory Parks and Wildlife Conservation Act 2000* (NT), 2012.
WA	Vulnerable. *Wildlife Conservation Act 1950* (WA), November 2015.

Features	Description
Size:	60–65 cm.
Body:	The species is the largest migrant shorebird. It is distinguished by a very long (18 cm), pink-base, downcurved bill, nearly half the length of body and a brown rump and tail. The female's bill is longer (up to 20 cm). In flight, the bill is very prominent.
Plumage:	Birds have a finely dark-barred brown rump and tail. The underwing is pale brown with closely barred dark markings.
Voice	The voice is a haunting, sometimes grating, 'curlee, curlee' or 'crooee, crooe' mostly in flight. Other calls are a musical, bubbling running trill; rising then falling.



Eastern Curlew Photo: Dan Weller (Birdlife Australia)

Eastern Curlew *(Numenius madagascariensis)*

Habitat
The species occurs in estuaries, tidal mudflats, sandspits, saltmarshes, mangroves. It is seen occasionally in fresh or brackish lakes, and bare grasslands near water (Pizzey and Knight 2012).

Behaviour and Ecology
The species may be solitary or occur in large, dispersed flocks of hundreds in coastal environments (Marchant and Higgins 1993).

The Eastern Curlew is carnivorous, mainly eating crustaceans (including crabs, shrimps and prawns), small molluscs and some insects.

The birds are both diurnal and nocturnal, but very active at night, especially at low tide. Eastern Curlews find the burrows of prey by sight during the day or in bright moonlight, but also locate prey by touch (Marchant and Higgins 1993).

The Eastern Curlew is extremely wary and will take flight at the first sign of danger, long before other nearby waders become nervous.

Flocks fly in drawn-out lines or Vs, calling hauntingly.

The Eastern Curlew does not breed in Australia. Outside Australia, Eastern Curlews nest on small mounds in swampy ground, often near areas where wild berries are growing. The nest is lined with dry grass and twigs. Eastern Curlews nest in the Northern Hemisphere summer, from early May to late June, often in small colonies of two to three pairs. The birds may delay breeding until three to four years of age (del Hoyo et al. 1996).

Distribution and Abundance
The Eastern Curlew breeds in Russia and north-eastern China but its distribution is poorly known.

The Eastern Curlew is a common passage migrant in Japan, Korea, China and Borneo and, rarely, through Thailand and the Malay Peninsula. The world population is estimated at 35,000 (Bamford et al. 2008; Barter 2002; Australian Government Department of the Environment 2016). A few birds occur in southern Korea and China during the non-breeding season, but it is estimated that 28,000 Eastern Curlews spend the non-breeding season in north, east and south-east Australia (Barter 2002; Birdlife International 2001).

Within Australia, the Eastern Curlew has a primarily coastal distribution and is only rarely recorded inland. The species is found in all states, particularly the north, east, and south-east regions including Tasmania.

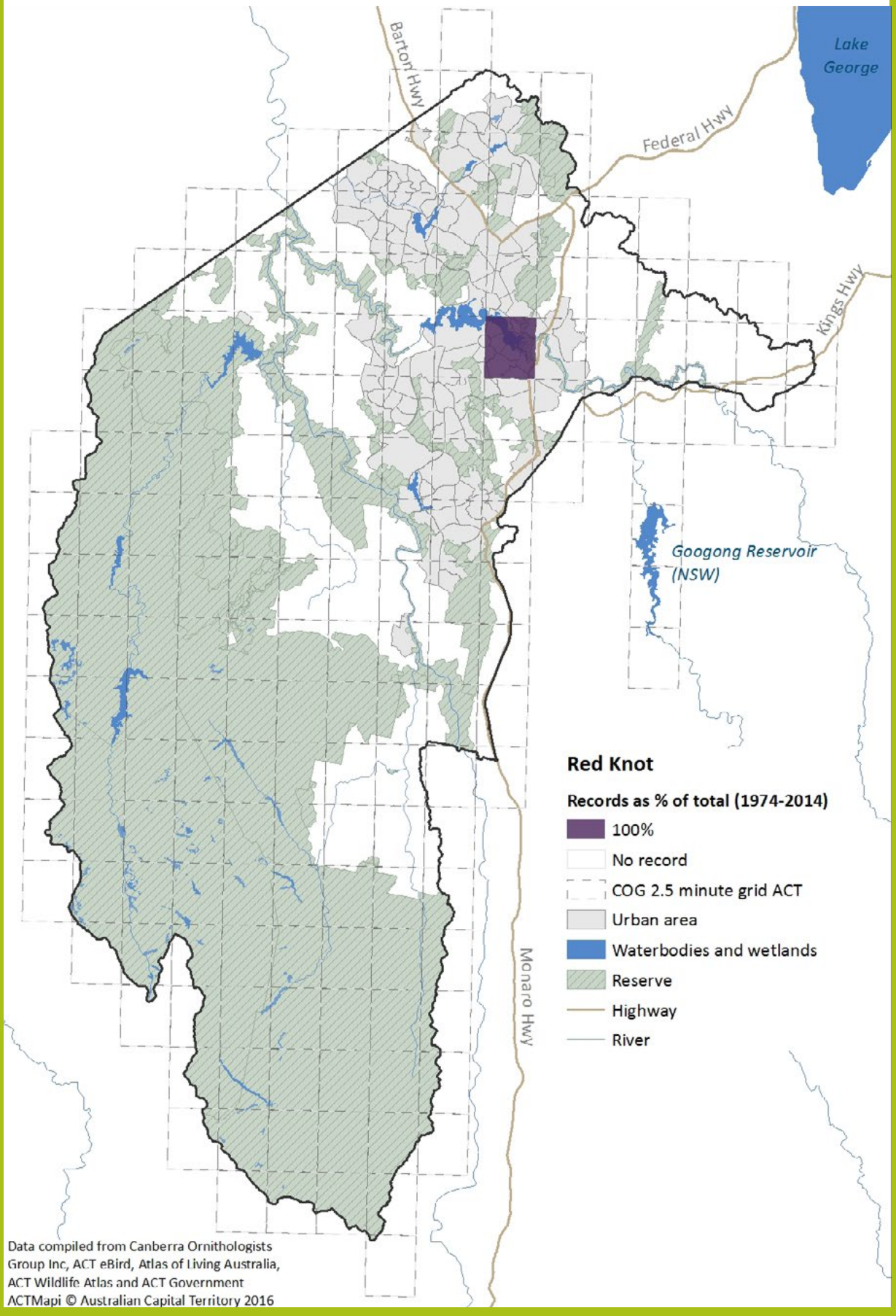
The population was previously recorded as declining in some areas of Victoria, Tasmania, South Australia and New Zealand over a period of 3060 years to the early 2000s (del Hoyo et al. 1996; Marchant and Higgins 1993). However, the population estimate has been steadily increasing from 1998–2008 due to additional count information (Bamford et al. 2008).

ACT occurrence
The species is only very rarely recorded in the ACT because this species has a predominantly coastal distribution in Australia. The first published record for the ACT (endorsed by COG) was of a single bird at Kellys Swamp on 9 January 1977 (McNoughton, 1977). There is a second historical record of four birds seen together as a group at Fyshwick Sewage Ponds on 12 August 1989 (eBird 2016). There is a third endorsed record for the ACT and region of a single bird in nearby NSW at Lake Bathurst, near Tarago on 21 August 1983 (Taylor and Davey 1985).

Specific Threats
The species is listed as a critically endangered species under the EPBC Act.

The species is particularly wary of humans who approach within 30–100 metres. This serves to illustrate the vulnerability of many shorebird species to disturbance by humans and stray animals, particularly those species which are subject to hunting pressure in other parts of their range.

Figure 9: Recorded distribution of the Eastern Curlew (*Numenius madagascariensis*) in the ACT

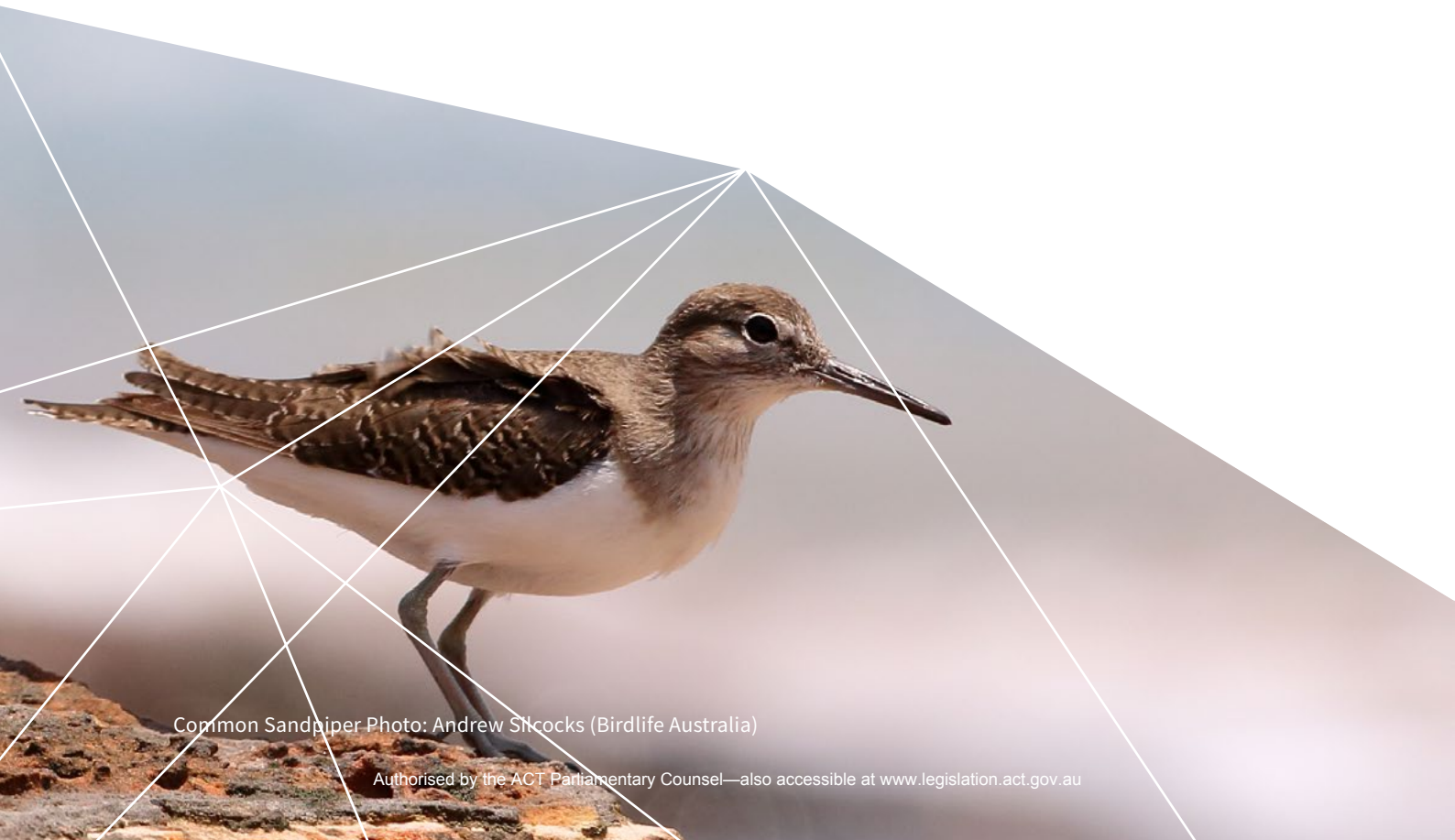


Common Sandpiper *(Actitis hypoleucos)*

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Migratory shorebird, one of 35 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Listed as Least Concern. Action Plan for Australian Birds (Garnett et al.2010).
ACT	Rare, non-breeding summer migrant (COG 2014).
NSW	Not listed.
VIC	Non-statutory: Vulnerable. (Advisory List of Threatened Vertebrate Fauna in Victoria: 2013).
SA	Rare. *National Parks and Wildlife Act 1972* (SA), 2011.

Features	Description
Size:	19–22 cm.
Body:	This is a dainty sandpiper of horizontal stance and constant nervous teetering.[1] The species has a long tail that extends behind the wings when at rest, short legs, and a medium length bill (Higgins and Davies 1996). The bill is fine, brown with buff base. The eyebrow and eye-ring are whitish, with slight dark eyeline; and the legs are grey-green, tinged yellow.
Plumage Adult:	Adults are bronze-brown to grey-brown above, very finely barred darker. They are white below with a distinct white 'hook' around the bend of the closed wing. The sides of the upper breast are washed brown.
Juvenile:	Juveniles are finely barred buff and black above.
Voice	The voice is a plaintive, piping 'twee-wee-wee 'or a single, rising 'weeep'.

1 A continuous wagging of the tail and rear part of the body.



Common Sandpiper Photo: Andrew Silcocks (Birdlife Australia)

Common Sandpiper *(Actitis hypoleucos)*

Habitat

Habitat includes the shallow, pebbly, muddy or sandy edges of rivers and streams on the coast and to the far inland. In coastal environments, the bird occurs at the margins of tidal rivers and waterways in mangroves or saltmarsh, mudflats and on rocky or sandy beaches (Pizzey and Knight 2012). It also occurs on dams, lakes, sewage ponds, causeways, riverside lawns, drains and street gutters.

Behaviour and Ecology

Birds are often found singly or in small groups feeding or perching on rocks, branches, boats, jetties or mooring piles. The Common Sandpiper avoids areas with congregations of more gregarious waders but will form flocks of up to 200 individuals prior to migration movements (Hayman et al. 1986).

The quick and fluttering flight of the species is distinctive, with clipped, shallow wingbeats broken by glides on downcurved wings. The species has a characteristic 'bobbing' walk, and continuous teetering whilst feeding (Hayman et al. 1986). It is an agile species when moving over rocky areas or through vegetation on river banks (Higgins and Davies 1996).

The Common Sandpiper is a diurnal feeder. Typically carnivorous, the species feeds in ooze and shallow water and eats molluscs such as bivalves, crustaceans such as amphipods and crabs and a variety of insects (Higgins and Davies 1996). The species will snatch low-flying insects and dart forward to secure prey. Individuals locate prey visually on the ground (especially among stones and cracks), in low vegetation or in the faeces of mammals. Common Sandpipers rarely probe whilst foraging, although they may push their bills sideways under debris on beaches.

The Common Sandpiper breeds in Europe and Asia within the period April to August (Higgins and Davies 1996), laying approximately four eggs. The nest is usually close to water and concealed by vegetation or overhangs. Incubation takes approximately 21–22 days, and chicks fledge in 26–28 days (Hayman et al. 1986).

Distribution and Abundance

The Common Sandpiper breeds in Eurasia and moves south for the northern winter. Most of the western breeding populations winter in Africa; eastern breeding populations winter in south Asia, Melanesia and Australia (Cramp and Simmons 1983).

The total population of the Common Sandpiper worldwide is in the order of 2,455,000–4,030,000 individuals (Delany and Scott 2002, cited in Bamford et al. 2008). The EAA Flyway population is estimated to be between 190,000 in east and south-east Asia, New Guinea, Australia and New Zealand (Rose and Scott 1997; Australian Government Department of the Environment 2016).

The species is found along all coastlines of Australia and in many inland areas. The Common Sandpiper is widespread in small numbers, estimated to be approximately 3000 birds (Geering et al.2007). The population in Australia is mainly concentrated in northern and western Australia (Blakers et al.1984; Higgins and Davies 1996).

ACT occurrence

This species is not commonly recorded in the ACT.

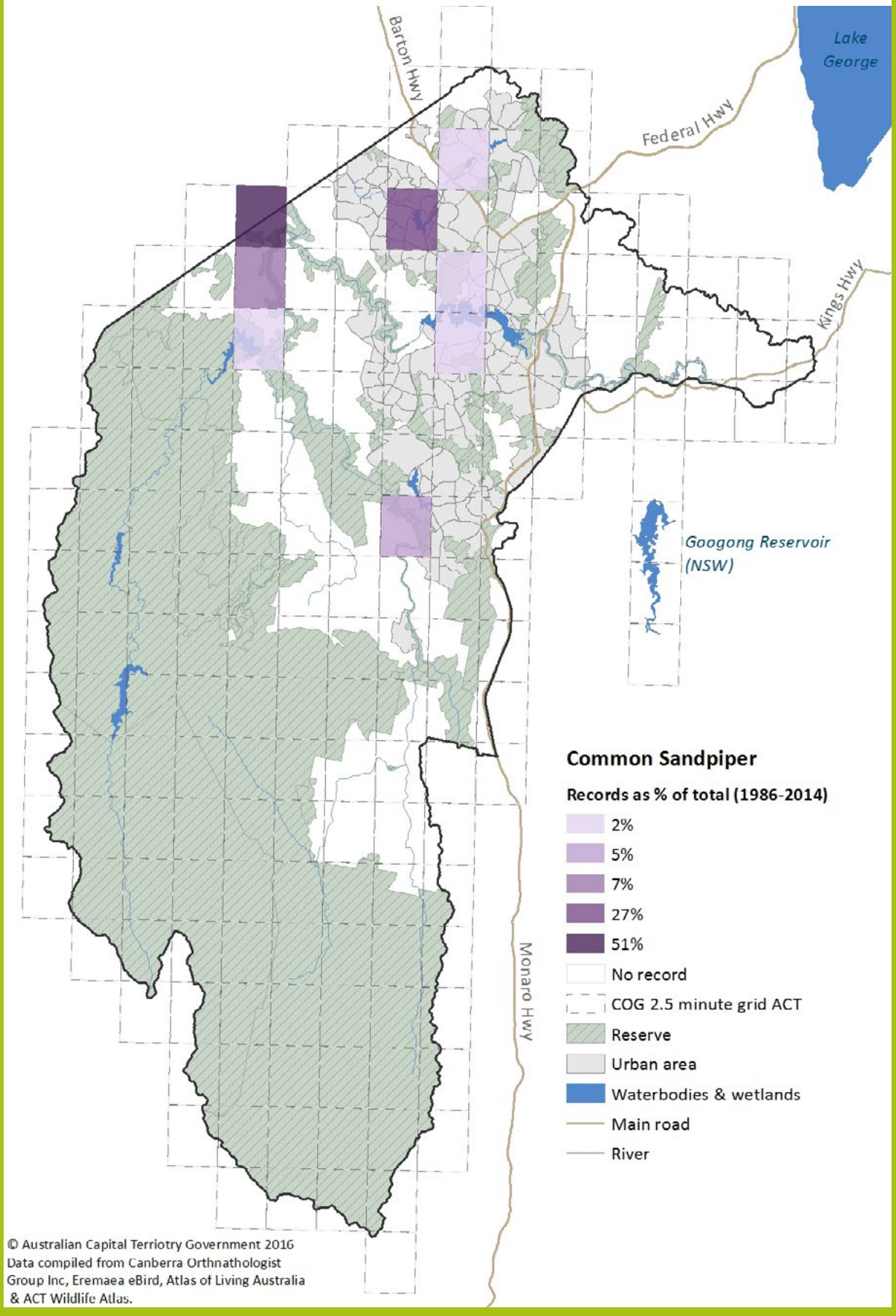
Despite its small numbers, the Common Sandpiper is the fourth most regular shorebird visiting the ACT. It has been recorded here in 39% of years (Australian Wildlife Services 2016 unpubl.). This regularity may be related to this species' broad habitat preferences. The limited records available show it has a preference for riparian habitats and lake margins in the ACT.

The most recent ACT record is of a single bird seen on three occasions at Lake Ginninderra in November, 2008 (CBN 35:1, 24; eBird 2016). Prior to that date there were observations of a single bird by several observers for at least three consecutive years (2004–2006) at Uriarra Crossing on the Murrumbidgee River (Perkins 2005).

There have also been earlier observations at Uriarra Crossing (1999, 2001). Other sites along the Murrumbidgee in the ACT where this species has been recorded include Pine Island (1986), Casuarina Sands (1987), Lake Burley Griffin at Lotus Bay (1987) and Black Mountain Peninsula (1988); Isabella Pond (1990, 1991); and Lake Ginninderra (1994).

The first Bird Atlas records the Common Sandpiper as present for the 10 degree grid square including the ACT and for nearby Lake Bathurst in NSW (Blakers et al.1984). Earlier records include two records of a single bird at Kellys Swamp in January 1978 (CBN 4:7, 70) and at the Molonglo River where it enters Lake Burley Griffin in 1972 (CBN 2:2, 19).

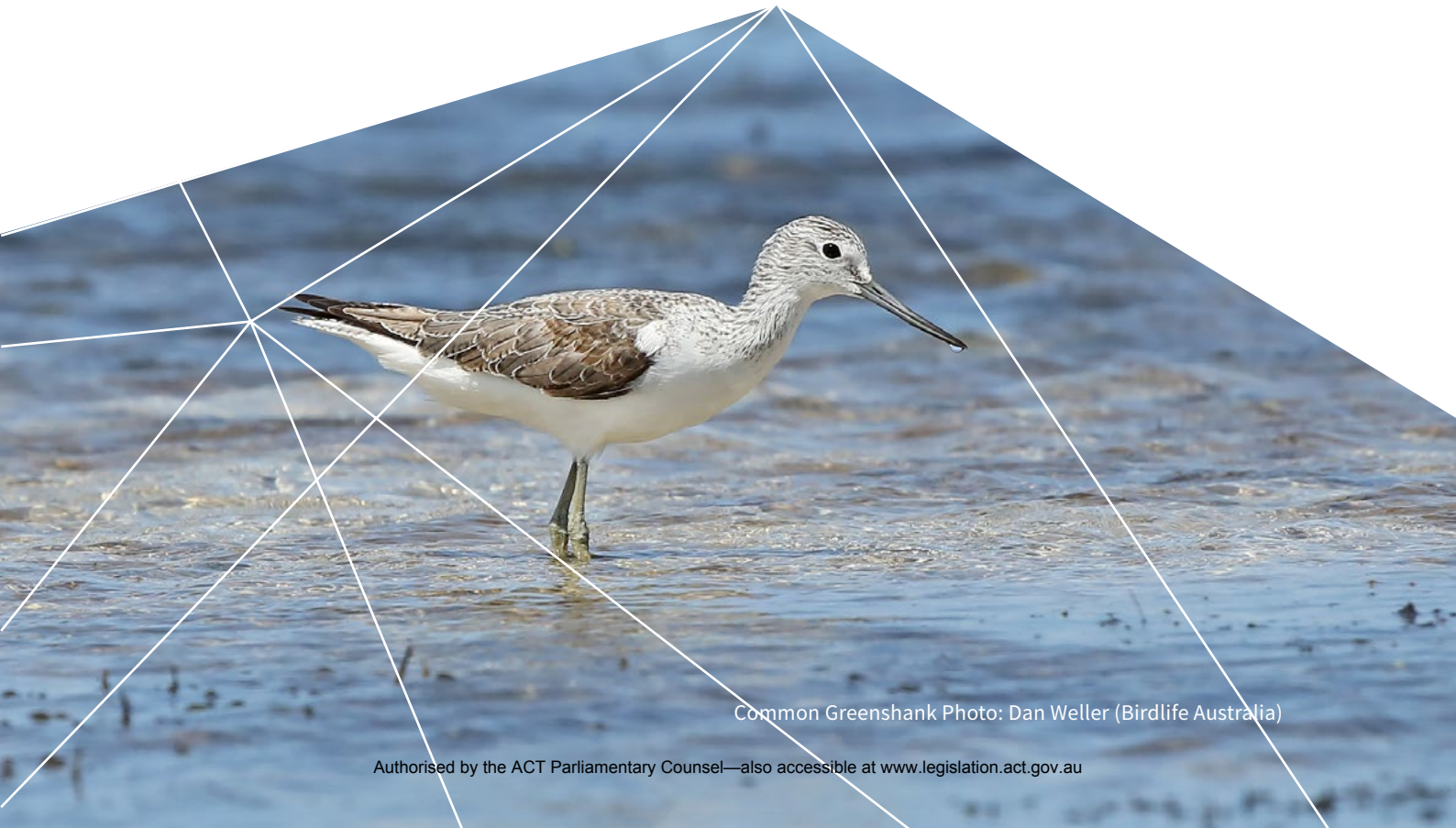
Figure 10: Recorded distribution of the Common Sandpiper (*Actitis hypoleucos*) in the ACT



Common Greenshank *(Tringa nebularia)*

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Migratory shorebird, one of 37 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
VIC	Non-statutory: Vulnerable. (Advisory List of Threatened Vertebrate Fauna in Victoria: 2013)

	Description
Size:	30–34 cm.
Body:	This is a large, pale and nervous shorebird with a medium-long and slightly upturned bill that is lead-grey at its base, with black tip. It has grey-green legs.
Plumage Non-breeding:	Birds are very pale, with slight dark mark before and behind eye. The wings and back are pale grey-brown with fine white feather margins and 'toothings'; the grey extends to sides of upper-breast. The lower breast and underparts are white.
Breeding:	The head, neck and breast are more heavily streaked grey-brown. The upper parts have scattered, white-notched black feathers.
Juvenile:	Juveniles are like breeding adults, but with buffish edges to the feathers of the upper parts.
Voice	The voice is a strident, ringing 'tew-tew' or 'tew-tew-tew' with sobbing intonations.



Common Greenshank Photo: Dan Weller (Birdlife Australia)

Common Greenshank *(Tringa nebularia)*

Habitat

The Common Greenshank occurs in all types of wetlands and has a wide distribution in Australia (Higgins and Davies 1996).Habitat includes mudflats, estuaries, saltmarshes, the margins of lakes, wetlands, claypans, fresh and saline, commercial saltfields and sewage ponds (Pizzey and Knight 2012).

Behaviour and Ecology

The Common Greenshank generally occurs as single birds or in small groups, but occasionally in larger flocks. The birds wade in shallow water along the edge of water in tidal estuaries, muddy claypans, salt works and saltpans (Higgins and Davies 1996).

The species is nervous, wary, noisy and excitable. It dashes about while feeding, bobbing its head. When flushed from vegetation, its ringing alarm call alerts other shorebirds. Its flight is fast and zigzagging with clipped wingbeats, and its toes protrude beyond its tail (Pizzey and Knight 2012; Higgins and Davies 1996).

The Common Greenshank is carnivorous. In Australia it has been recorded eating molluscs, crustaceans, insects and, occasionally, fish and frogs. Elsewhere, it has also been recorded eating annelids, lizards, and rodents. The species feeds during both day and night. It is active and agile, finding prey by sight or, occasionally, by touch.

The Common Greenshank does not breed in Australia. Elsewhere, it nests on the ground in the open, but usually next to a piece of dead wood or beside rocks, trees, fences or sticks that act as nest markers. The nest is a shallow scrape lined with some plant material (del Hoyo et al. 1996). Three to five (mostly four) eggs are laid in late April to June (del Hoyo et al. 1996). Incubation lasts for 22–26 days (del Hoyo et al. 1996) and chicks fledge approximately 25–31 days after hatching.

Distribution and Abundance

The Common Greenshank is found in Europe, Africa, Asia, Melanesia and Australasia. It breeds in Eurasia, Scotland, Scandinavia, east Estonia and north-east Belarus, through Russia and east to Siberia to the middle reaches of the Anadyr River, the Kamchatka Peninsula, north Sakhalin and lower Amur River.

The global population is estimated to be 440,000–1,500,000 (BirdLife International 2010). Internationally, four populations are recognised: Europe/west Africa (200,000–500,000 birds), south-west Asia/east and south Africa (wintering, >100,000), southern Asia (wintering, 10,000–100,000) and eastern/south-eastern Asia and Australia (wintering, 110,000) (Delaney and Scott 2002). The species conservation status is secure due to its extensive breeding range (del Hoyo et al.1996).

The EAA Flyway population of the species is thought to be approximately 110,000, of which 18,000–19,000 spend the non-breeding season in Australia (Bamford et al.2008; Australian Government Department of the Environment). The species shows significant regional variation but there has not been any overall change in the population between the two atlas surveys, which occurred 20 years apart (Barrett et al. 2002).

The species arrives in Australia from August, mainly in the west (Lane 1987), though it also passes through Torres Strait (Draffan et al.1983). The Common Greenshank appears to move elsewhere in Australia from Western Australia by November, but there is no apparent difference in timing of arrival between coastal and inland, or northerly and southerly sites (Lane 1987). The Common Greenshank overwinters at only a few sites which reach expected wintering numbers from late April to early. Northward migration occurs from March, but mostly in April when numbers decline at sites throughout Australia.

ACT occurrence

Although widespread in its Australian distribution, this species is not commonly recorded in the ACT.

The pattern of sightings over 30 years in the ACT has been irregular, usually sightings of single birds, but only a few times each year. The Common Greenshank is the fifth most regular shorebird visiting the ACT having being recorded here in 22% of years (Australian Wildlife Services 2016 unpubl.).

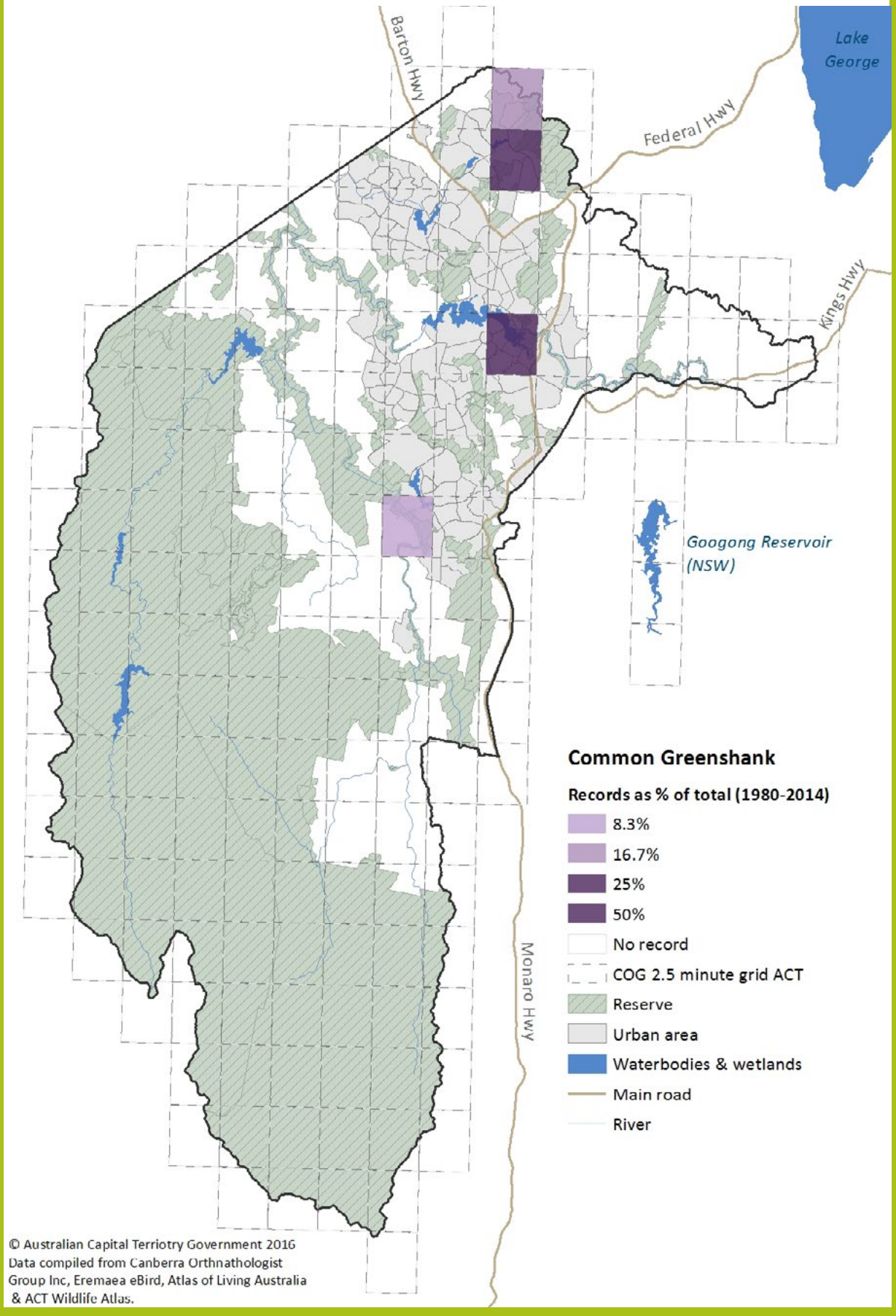
In the ACT, most sightings are usually at Kellys Swamp, JWNR or at the Fyshwick Sewage Ponds, but there have been other localities, with sightings at Mulligans Flat Big Dam (e.g. in 2013, 1996 and 1994), Lake Burley Griffin (East Basin) and Tuggeranong Weir (1986).

Recent sightings of this species occurred in November 2014, together with Sharp-tailed Sandpipers at the Fyshwick Sewage Ponds; and again, at Fyshwick Sewage Ponds between 14–17 November 2015 (COG 2016). In 2012–13 one bird was observed at Mulligans Flat Big Dam on 29 January 2013 (CBN 39:1, 38). The species was also seen at Kellys Swamp, JWNR on 4 October 2009 (CBN 36:1, 24).[9]

The Common Greenshank is recorded at a higher overall frequency nearby in NSW, usually at Lake Bathurst (the species was recorded there in 13 years out of 18 for the period 1987–2005). There were two records of single birds in 2015–16: 8 December 2015 at Lake Bathurst; and 5 February 2016 at Lake George.

9 It was not seen in the intervening years from 2009 to 2013.

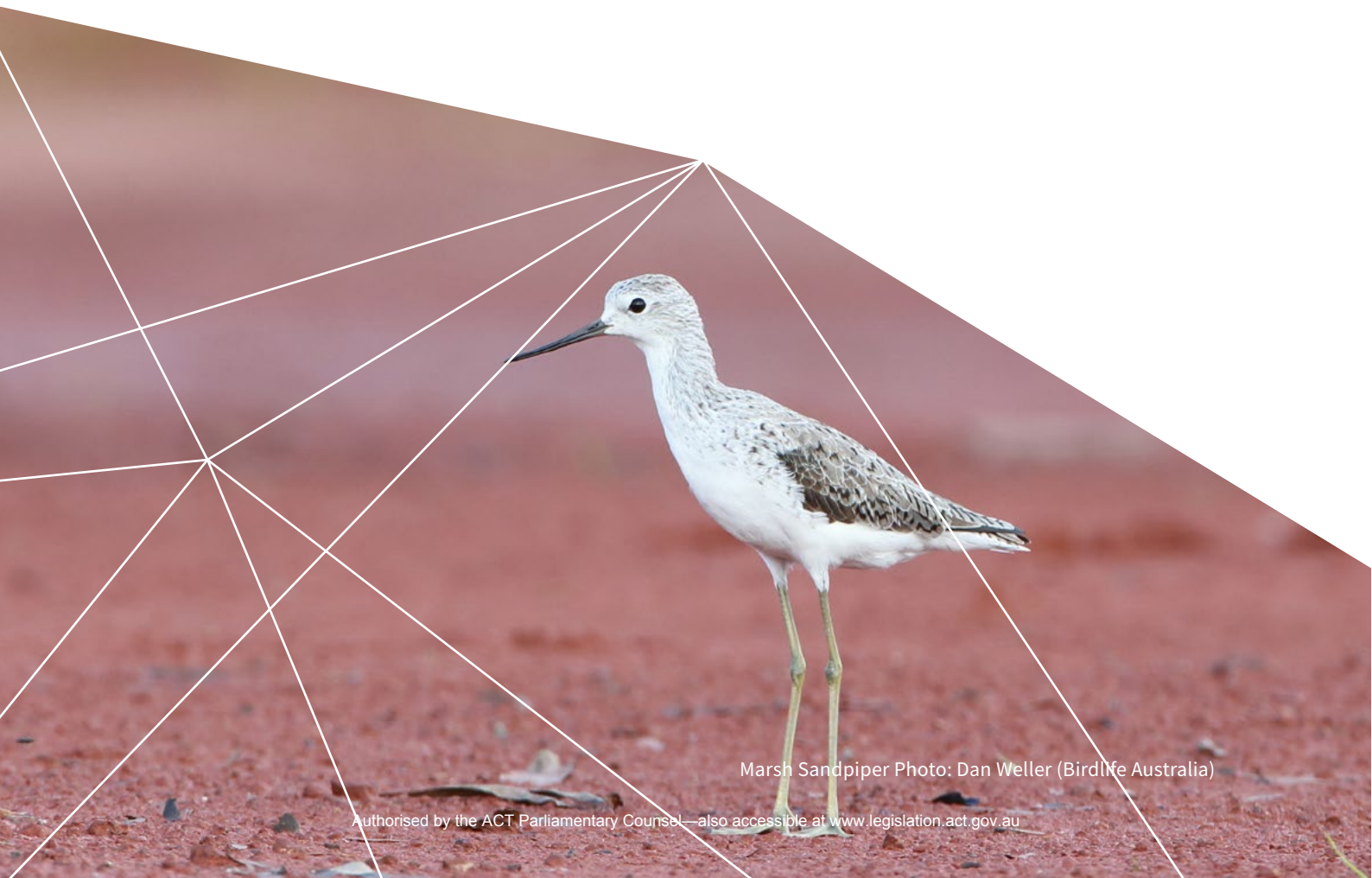
Figure 11: Recorded distribution of the Common Greenshank (*Tringa nebularia*) in the ACT



Marsh Sandpiper (*Tringa stagnatilis*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Migratory shorebird, one of 35 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia 2015b).
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al.2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
VIC	Non-statutory: Vulnerable. (Advisory List of Threatened Vertebrate Fauna in Victoria: 2013)

	Description
Size:	Size: 22–25 cm.
Body:	Birds are like a small, finely built Common Greenshank with a straight, needle-like black bill and proportionately longer and more stilt-like yellow-green, grey-green or yellow legs.
Plumage Non-breeding:	The forehead, face and foreneck are whiter than the Common Greenshank. The feathers of the upper parts are finely margined and paler. The bird has black shoulders and the flight feathers contrast with paler grey upper parts.
Breeding:	The feathers of the upper parts have dark-brown centres and buff-grey edges, with notches and bars. The foreneck is streaked black, and the flanks have a fine dark V-bar.
Voice	The voice is a sharp 'yip-chik'; a sharp musical 'chiff chiff' tweetering trills; or a soft 'teeoo'.



Marsh Sandpiper Photo: Dan Weller (Birdlife Australia)

Marsh Sandpiper (*Tringa stagnatilis*)

Habitat
The species occurs in salt, brackish or freshwater wetlands, constructed features including sewage ponds, commercial salt fields and bore drains, and in coastal mangroves, tidal flats and estuaries (Pizzey and Knight 2012).

Behaviour and Ecology
Occurs as single birds or in small parties and, occasionally, larger flocks. It flies quickly with wingbeats clipped (Pizzey and Knight 2012). Marsh Sandpipers often associate with other waders and are often seen with Greenshanks, (Higgins and Davies 1996).

The Marsh Sandpiper is carnivorous. It has been recorded eating insects, molluscs and crustaceans. The birds usually feed in shallow water. They generally pick at the surface of water or mud and may glean from vegetation. They feed singly or in groups and have also been recorded following ducks, egrets and other waders, feeding on prey disturbed by these birds (Cramp and Simmonds 1983).

The Marsh Sandpiper does not breed in Australia. Within its breeding distribution in eastern Europe, southern Siberia and northern China the species is known to breed solitarily or in loose colonies, sometimes with other species. The nest (usually filled with dry grass) is usually located on a mound, in short vegetation and close to water. Laying occurs late April–June. Birds usually lay four eggs, but can lay from three to five. The age of first breeding is one year or older (del Hoyo et al. 1996).

Distribution and Abundance
The global population is estimated at 186,000–1,242,000 (Bamford et al.2008).

The Marsh Sandpiper migrates south for the boreal winter to non-breeding areas including Africa, across southern Asia to Australia. They are a common passage migrant through North Africa. The species occurs around the coasts of the Arabian Sea to the Indian subcontinent and is widespread in south East Asia and Indomalaya and Micronesia. They are known to pass through eastern China, Korea and Japan. They are regular to Norway and Holland in recent years (Higgins and Davies 1996).

The Marsh Sandpiper has an estimated EAA Flyway population of 130,000 (Australian Government Department of the Environment 2016). In Australia, an overall increase was detected between atlases that were 20 years apart, but this trend showed significant regional variation (Barrett et al. 2002). Victorian counts peaked from 1995–97 but in 1999–2001 returned to levels found in the 1980s and early 1990s (Wilson 2001).

Birds arrive in Australia from September and move south across the continent from September–December (Lane 1987). The Marsh Sandpiper begins to migrate north in March–April. Non-breeding birds may overwinter in non-breeding areas or at sites between breeding and non-breeding areas (Hayman et al. 1986); a few remain in Australia (Blakers et al.1984), particularly in northern Australia, but also in Victoria, NSW and South Australia (Higgins and Davies 1996).

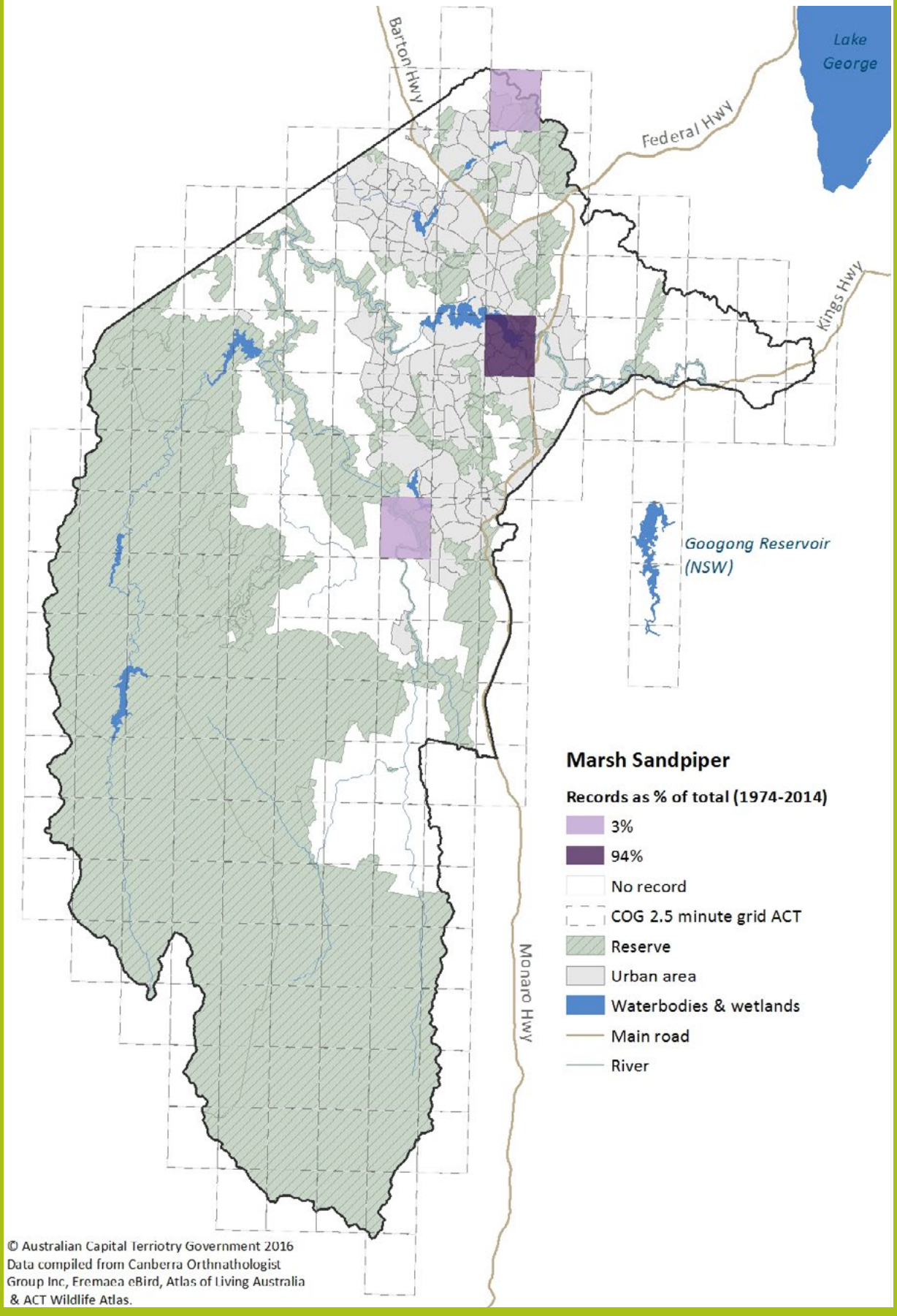
ACT occurrence
The Australian distribution is predominantly coastal but also widespread, extending inland in the eastern half to the south and north of the continent. The species is not commonly recorded in the ACT and most records are of single birds, 90% of which have been at JWNR (Kellys Swamp, Jerrabomberra Pool). The most recent record is of one bird at JWNR on 18 January 2015 (eBird 2016, CBN41: 1, 38) followed by three records of a single bird at Kellys Swamp (JWNR) on 22 January 2009 (CBN 35:1, 24). From 11–16 September 2004 there were four records of a single bird at Kellys Swamp, JWNR (eBird 2016).

Other locations in the ACT where the Marsh Sandpiper has been recorded are:

- Fyshwick Sewage Ponds on 17 January 2015 (eBird 2016)
- Mulligans Flat (probably on the Big Dam) on 17 October 1994 (Atlas of Living Australia 2015)
- at the Silt Trap, Isabella Pond, Tuggeranong on 16 December 1990 (CBN 18:4, 81).

Typically there are more records of the Marsh Sandpiper in nearby NSW than in the ACT, predominantly at Lake Bathurst and The Morass, but also at Lake George. These records are often of small parties; for example five birds at Lake Bathurst, East Basin on 28 December 2013 (CBN 39:3, 210); 10 birds at The Morass on 19 September 2005 (CBN 32:1,20); six birds at Lake Bathurst, East Basin on 21 December 2004 (CBN 30:1, 18); and three birds on 6 March 1991 at Lake George South (CBN 21:4, 94).

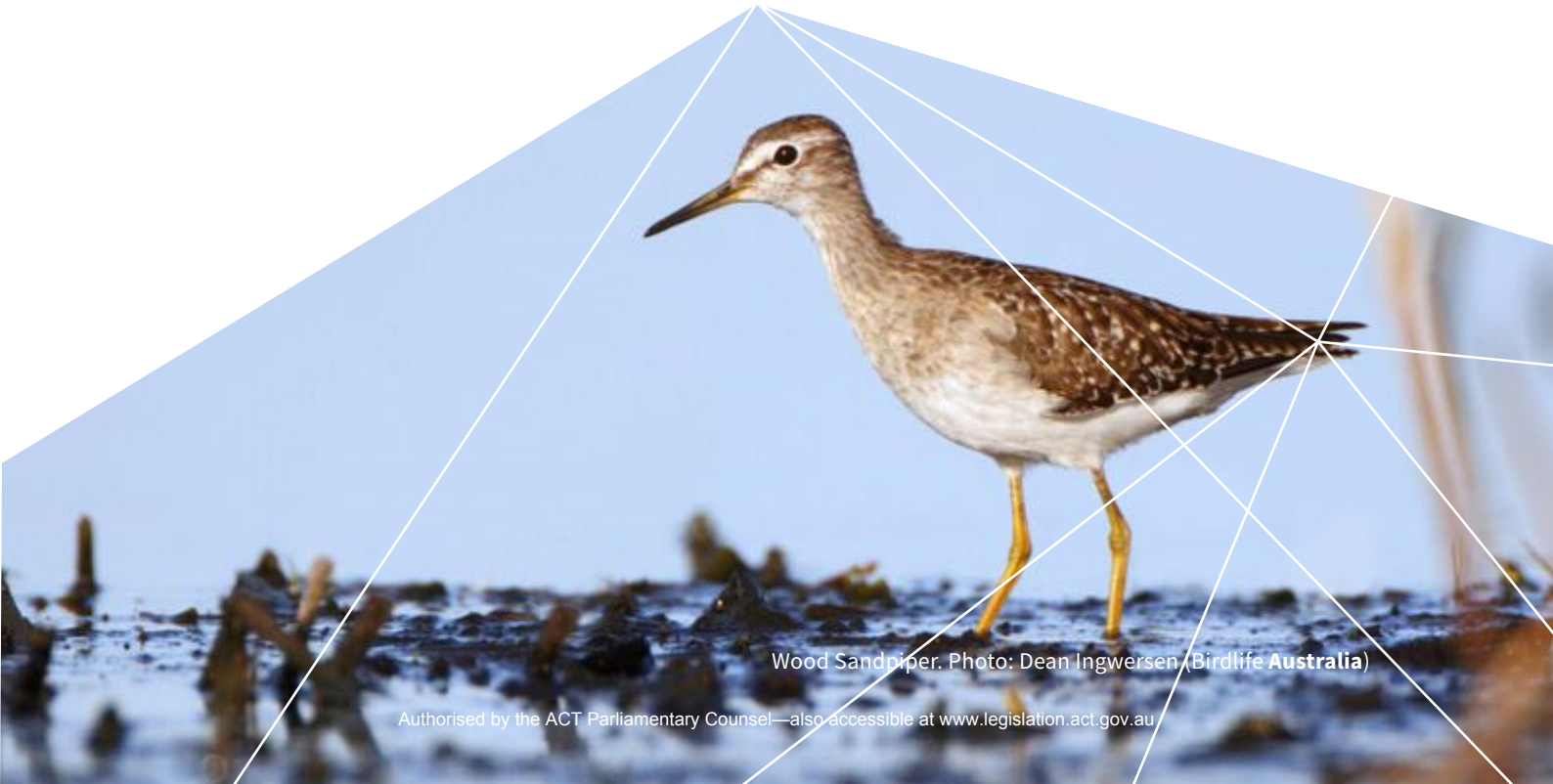
Figure 12: Recorded distribution of the Marsh Sandpiper (*Tringa stagnatilis*) in the ACT



Wood Sandpiper (*Tringa glareola*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Migratory shorebird, one of 35 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
SA	Rare. (*National Parks and Wildlife Act 1972,* June 2011).
VIC	Non-statutory: Vulnerable. (Advisory List of Threatened Vertebrate Fauna in Victoria: 2013).

Features	Description
Size:	20–23 cm.
Body:	Birds have a longish straight black bill, a dark line from the bill to the eye under a long white eyebrow and whitish eye-ring, and longish yellow-green legs.
Plumage Non-breeding:	Birds are grey-brown above with plentiful white spots and 'notching' on wing feathers. They are whitish below and washed grey across the breast.
Breeding:	The crown and upper parts are a rich grey-brown, heavily spotted with white. The throat is white and the fore neck and breast are streaked grey-brown.
Juvenile:	The upper parts are a warmer, spotted buff-brown than the adults.
In flight:	A white rump, barred at sides is displayed in flight as is a light-grey underwing. The yellow legs extend beyond the tail.
Voice	The voice is a shrill excited: 'chiff-chiff-chiff', less strident than Common Greenshank, or a liquid 'tlui'.



Wood Sandpiper. Photo: Dean Ingwersen (Birdlife **Australia**)

Wood Sandpiper (*Tringa glareola*)

Habitat

Habitat includes the muddy margins of wetlands, tidal mangroves, and margins of tidal mudflats. It also inhabits saltmarshes and sewage farms. It is most often found in shallow, localised shallow freshwater situations, often among dead timber and other cover (Pizzey and Knight 2012).

Behaviour and Ecology

Birds occur singly or in pairs or small groups and occasionally in larger flocks. They associate freely with other shorebirds and often feed in scattered groups. Birds will perch on dead branches and fence-posts.

The Wood Sandpiper is carnivorous, eating mainly insects and molluscs in Australia (Higgins and Davies 1996). Elsewhere the species also eats seeds, algae, worms, crustaceans, arachnids, fish and frogs (Cramp and Simmonds 1983). The species wades in shallow fresh water, gleaning prey from the surface of the water. They are known to probe, sometimes with their head and neck submerged, and sweep the bill from side to side under water (Higgins and Davies 1996).

The Wood Sandpiper does not breed in Australia. Within the breeding range, the species is solitary, normally 1–10 pairs/km^2 but up to 50 birds/km^2 in forest tundra. The nest, a scrape on the ground amongst dense cover, is usually lined with moss, stems and leaves. The species also sometimes nests in the old nests of other species in trees. The Wood Sandpiper lays four eggs, sometimes three, from May to mid-July, in a single brood. Incubation lasts 22–23 days with fledging at 28–30 days. The age of first breeding is one year (del Hoyo et al. 1996). The oldest recorded banded bird was 9 years, 2 months.

Distribution and Abundance

The global population is estimated at 3,055,000–4,320,000.

The Wood Sandpiper is a migratory species that breeds throughout Eurasia. It breeds mostly in Scandinavia, the Baltic countries and Russia and rarely in Iceland, Scotland and western Europe. In Russia (where the breeding distribution is continuous with Scandinavia) the Wood Sandpiper breeds west to around headwaters of Pripyat River in the Minsk region. It has been suggested that the Australian non-breeding population probably breeds in eastern Siberia (Blakers et al. 1984).

The non-breeding habitat areas are mainly in tropical and subtropical Africa, south Asia to south China, Philippines, Indonesia and Australia. The species may pass through the Mediterranean, Tibet, northern China, Korean Peninsula, Japan, Taiwan, Hong Kong and west Micronesia on its way to its summer feeding grounds.

An estimated 130,000 Wood Sandpipers occupy the EAA Flyway (Australian Government Department of the Environment 2016). Most of this Flyway population spends the non-breeding season in South East Asia. This species is the most abundant migratory shorebird in non-coastal areas of Asia, but only a small proportion of the Asian population reaches Australia. It is moderately common in northern Australia, uncommon but regular in coastal and near-coastal southern Australia, and sparsely distributed through inland Australia on suitable habitat.

The species arrives in Australia and New Guinea from August, when they are first recorded in the north and the interior. In Darwin they often arrive in flocks of up to 60 birds that soon disperse (Higgins and Davies 1996). Only a few birds winter in Australia (Blakers et al.1984).

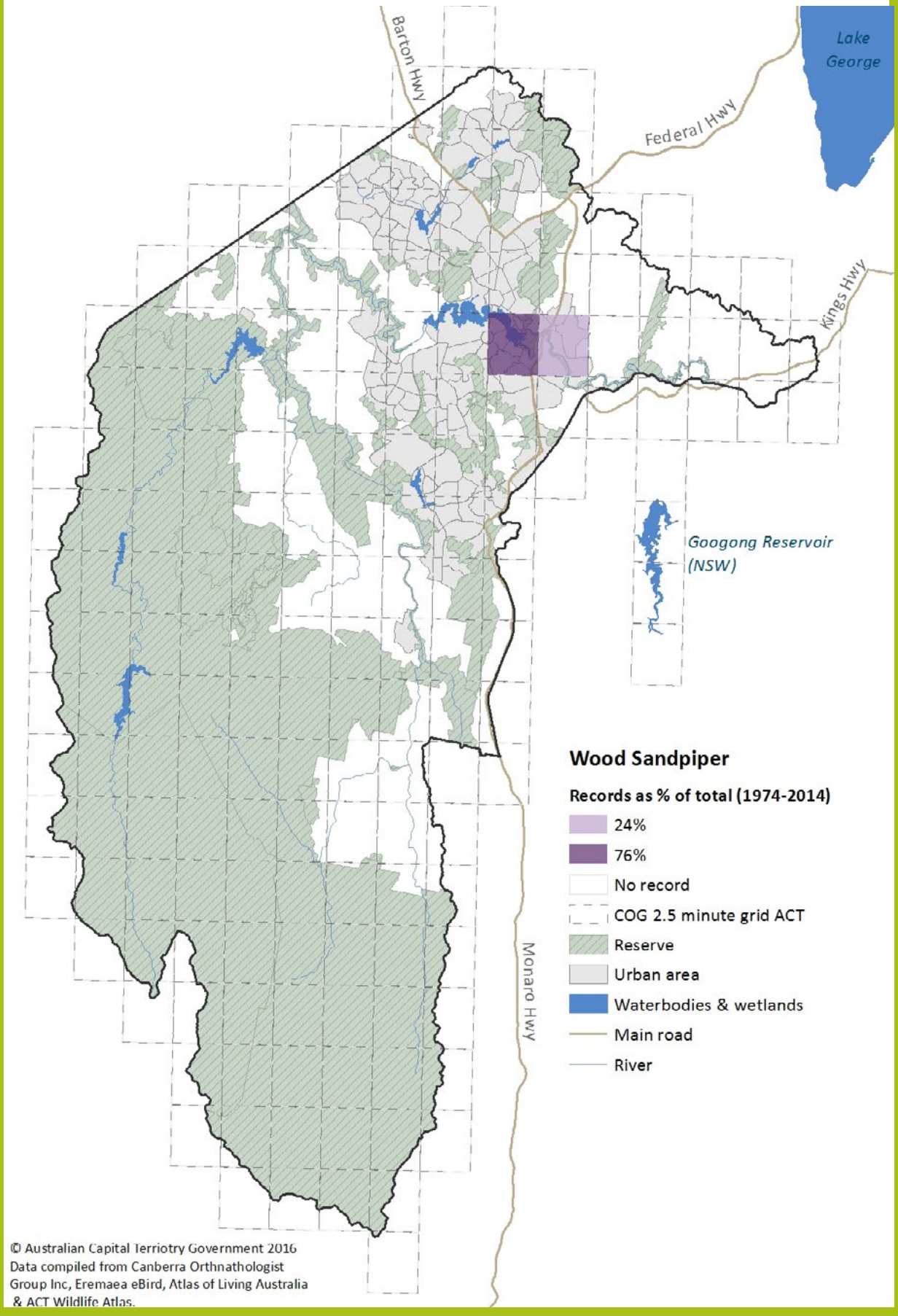
ACT occurrence

The Wood Sandpiper is only rarely observed in the ACT and region, occurring in only 8% of years (Australian Wildlife Services 2016 unpubl.). Most observations have been made at JWNR (Kellys Swamp), Fyshwick Sewage Ponds and Lake Bathurst in NSW and, much less frequently, at Lake George, NSW.

The first record of a Wood Sandpiper at Lake George was on 25 April 1990 (CBN 18:4, 81). Prior to that the Wood Sandpiper was recorded as being present for the ACT in the First Bird Atlas Survey for the 10 minute grid square covering the ACT on 1 January 1978 (ALA, 2015; CBN 4:4, 7). The earliest records of the species are for birds seen at the Molonglo River in the ACT in 1965 and 1966, with the 'first ACT record' cited as '1 Molonglo R' on 21 November 1965 (CBN 13:1, 10).

More recently, five birds were seen at Lake Bathurst (East Basin) on 27 January 2014 (CBN 38:3, 259) and a single bird was at Lake Bathurst (West Basin) on 27 August 2012 (CBN 39:1, 38). Together with observations of a single bird at Fyshwick Sewage Ponds in the ACT (seen on four days, from 8–13 October 2013), these are the only records of this species in the ACT region since nine reports of one bird at Kellys Swamp between 22 January and 28 February 1995 (CBN 23 (Supp.) 24).

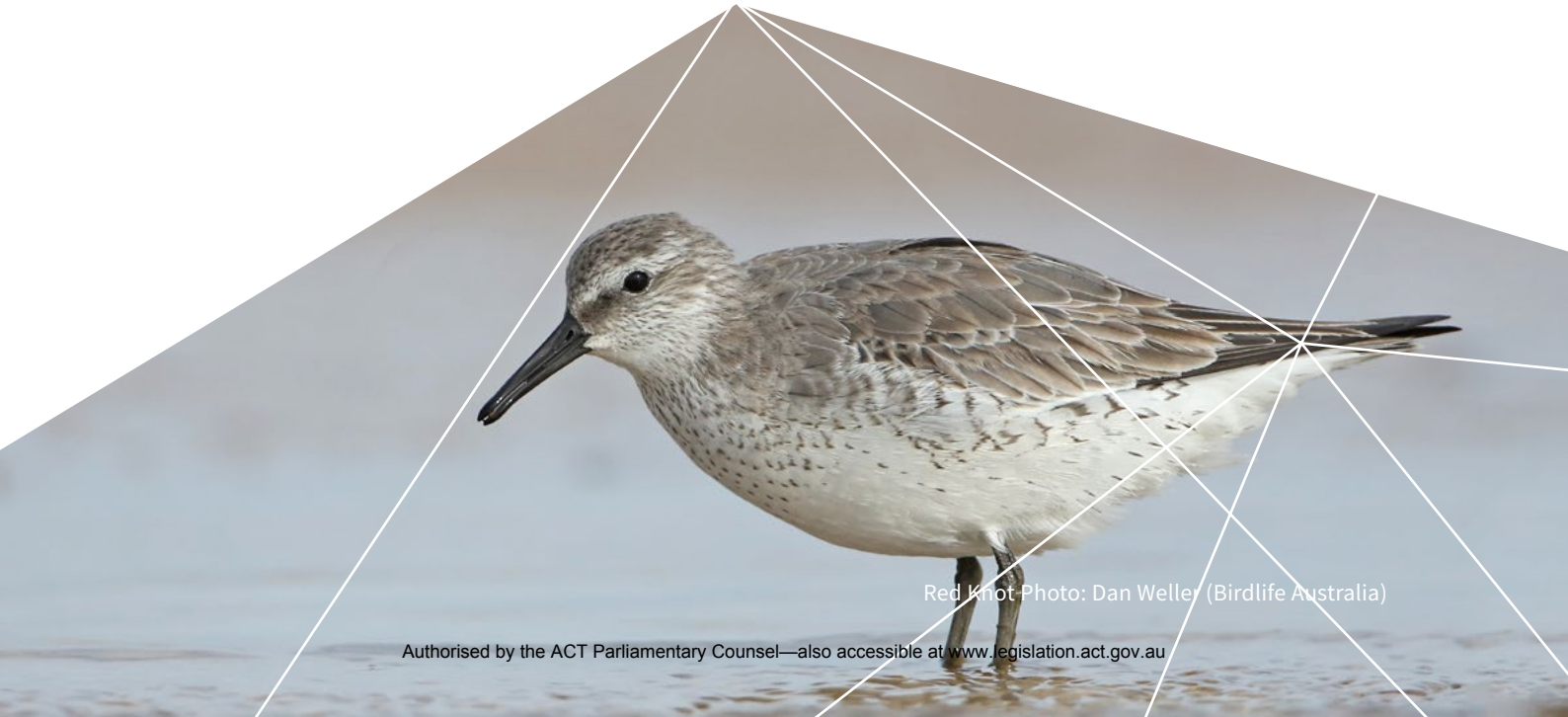
Figure 13: Recorded distribution of the Wood Sandpiper (*Tringa glareola*) in the ACT



Red Knot (*Calidris canutus*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Endangered. Environment Protection and Biodiversity Conservation Act 1999 (Cth.)
	Migratory shorebird, one of 35 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Vulnerable. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
NT	Vulnerable. (*Territory Parks and Wildlife Conservation Act 2000* (NT): 2012).
WA	Vulnerable.* (*Wildlife Conservation Act 1950* (WA): November 2015). * subspecies Calidris canutus rogersi and C. c. piersmai.
VIC	Non-statutory: Endangered (Advisory List of Threatened Vertebrate Fauna in Victoria: 2013).

Features	Description
Size:	23–26 cm.
Body:	A low slung, full-bellied grey wader with a straight, slightly tapering black bill roughly equal to length of the head. The legs are short and dull green.
Plumage Non-breeding:	The head has a pale area around the bill, a slight pale eyebrow and a darkish mark back from bill through the eye, which widens on ear-covert. The body has fine pale feather edges the on upper parts, and slight dark streaks and bars on the breast and flanks.
Breeding:	The bird is 'red' only in the breeding plumage. The face and body are rust-red to chestnut; the upper parts are spangled black, buff and silver. The female is duller.
Juvenile:	Juveniles are buffer than non-breeding plumage, with a stronger scaly pattern above. A thin white wing bar and finely barred white rump, which looks grey, is visible and the tail is grey.
Voice	The voice is a throaty 'knut-knut'; mellow whistling 'tooit-wit'; and subdued musical chatter while feeding or in flight.



Red Knot Photo: Dan Weller (Birdlife Australia)

Red Knot (*Calidris canutus*)

Habitat
Habitat includes tidal mudflats, sandflats, beaches, saltmarshes, flooded pastures and ploughed lands.

Behaviour and Ecology
The species occurs in small groups with other waders or dense flocks. Massed flocks perform swift aerobatics. They are known to feed in large mixed flocks in the company of other shorebirds.

The Red Knot is omnivorous. In Australia, the species eats mostly worms, bivalves, gastropods, crustaceans and echinoderms (Higgins and Davies 1996). In Roebuck Bay, Western Australia, they feed predominantly on buried bivalves which are located by touch. Birds feed steadily with rapid down-thrusts of the bill and with the head often submerged (Pizzey and Knight 2012). In non-breeding areas, feeding activity is regulated by the tide; they feed less just before and after high tide, but timing of cessation of feeding and roosting depends on the time of year and height of tides.

The Red Knot is diurnal and nocturnal.

The nominate subspecies *Calidris canutus* breeds on the Taymyr Peninsula and in central-north Siberia. The subspecies *C. rogersi* breeds in north-east Siberia, including the Chukotsky Peninsula, and possibly areas farther west. The subspecies *C. roselaari* breeds at Wrangel Island, Siberia, and north-west Alaska. The subspecies *C. rufa* breeds in the Canadian Arctic, south of 75 °N. The subspecies *C. islandica* breeds on the islands of the Canadian high Arctic and northern Greenland.

The Red Knot nests on open vegetated tundra or stone ridges, often close to a clump of vegetation, laying three to four eggs in June and incubating them for around 21–22 days. Once eggs have hatched, the females depart leaving the male to tend for young. Fledging occurs after 18–20 days. The age of first breeding is probably 3–4 years and individuals can live for over 18 years.

Distribution and Abundance

The Red Knot has a worldwide distribution, breeding at a range of locations right around the Arctic.

The species migrates to non-breeding areas that extend to the southernmost parts of the Americas, Africa, Europe and Australasia (del Hoyo et al.1996).

The global population of Red Knot is estimated at 1,090,000. The Red Knot population in the EAA Flyway is estimated at 110,000 (Australian Government Department of the Environment 2016). Information suggests that the population that over-winters and remains in north-west Australia is mostly the subspecies *C. c. Piersmai*, with the subspecies *C. c. rogersi* and, probably, *C. c. canutus* the subspecies most likely to occur in the eastern Australian region (Higgins and Davies 1996).

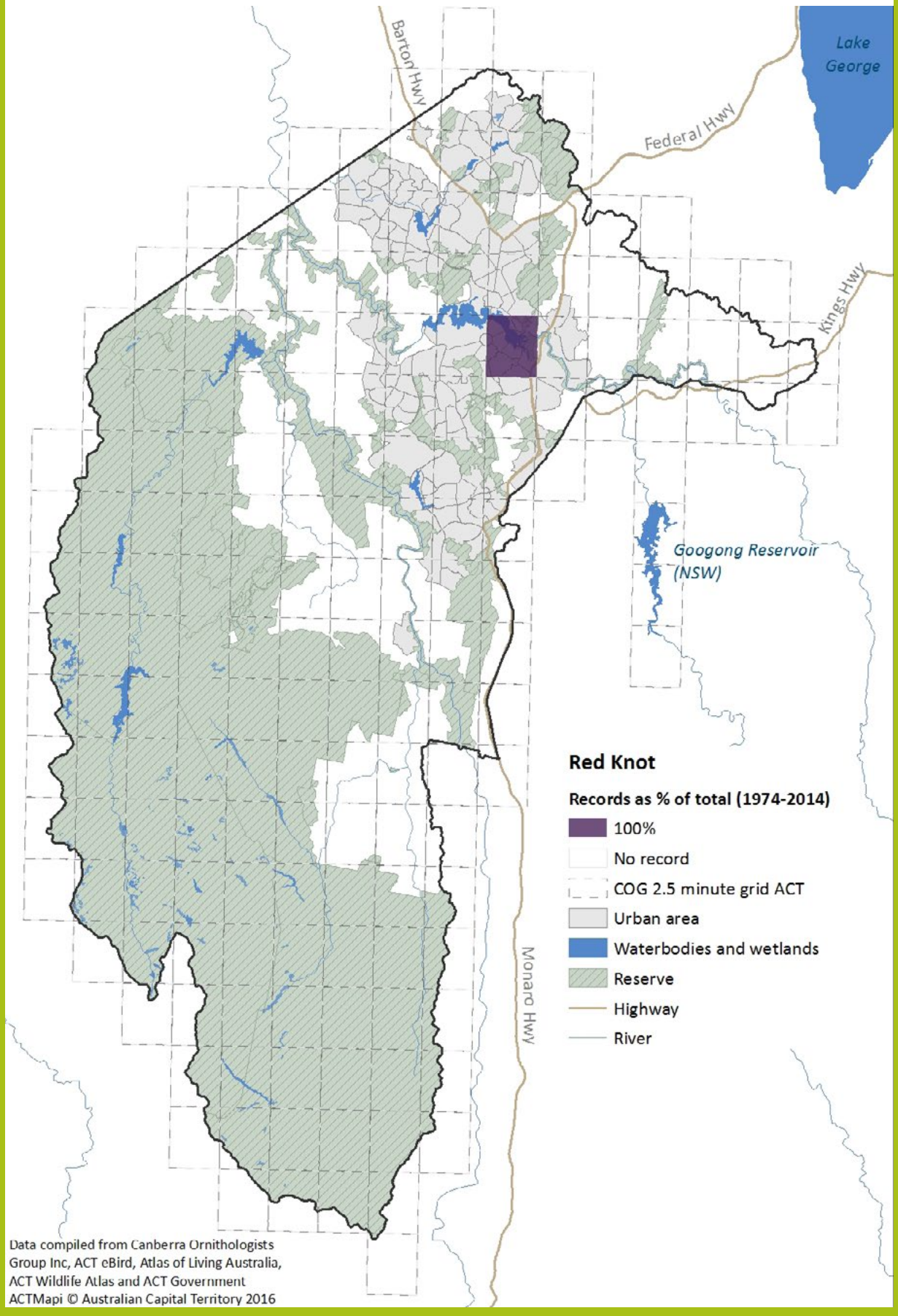
Red Knots arrive in north-west Australia from late August, where they rapidly increase their weight before migrating further. Most remain in the north, with less than 10,000 migrating to southern Australia (Lane 1987). Red Knots leave south-east mainland Australia from late February or late March to early April. It is suspected that both the New Zealand and south-east Australian birds move through the Gulf of Carpentaria, but inland records suggest that some birds move directly overland on their northern migration.

The Red Knot is not listed as globally threatened (del Hoyo et al.1996), but some populations (e.g. those in North America and Australia) are probably in decline. Numbers in Victoria have shown a marked decline, possibly reflecting changes in the larger population.

ACT occurrence
The Red Knot has a primarily coastal distribution in Australia and is most abundant in northern Australia. It is only very rarely recorded in the ACT and region, with only one published and endorsed record of this species in the ACT. Six observers recorded one bird at Fyshwick Sewage Ponds on 7 November 1999 (CBN 25:1, 48).

The first record of the Red Knot in the region was of three birds on 11 November 1986 at Lake Bathurst (CBN 13:3, 77). Five birds were observed at Lake George South on 28 October 1995 and three birds at Lake Bathurst East Basin on 26 October 1996 (CBN 24:2, pp. 71, 110). The most recent record of the Red Knot in the ACT region is of two birds seen at Lake Bathurst East Basin in NSW on 22 January 2014 (CBN 39:3, 219).

Figure 14: Recorded distribution of the Red Knot (*Calidris canutus*) in the ACT

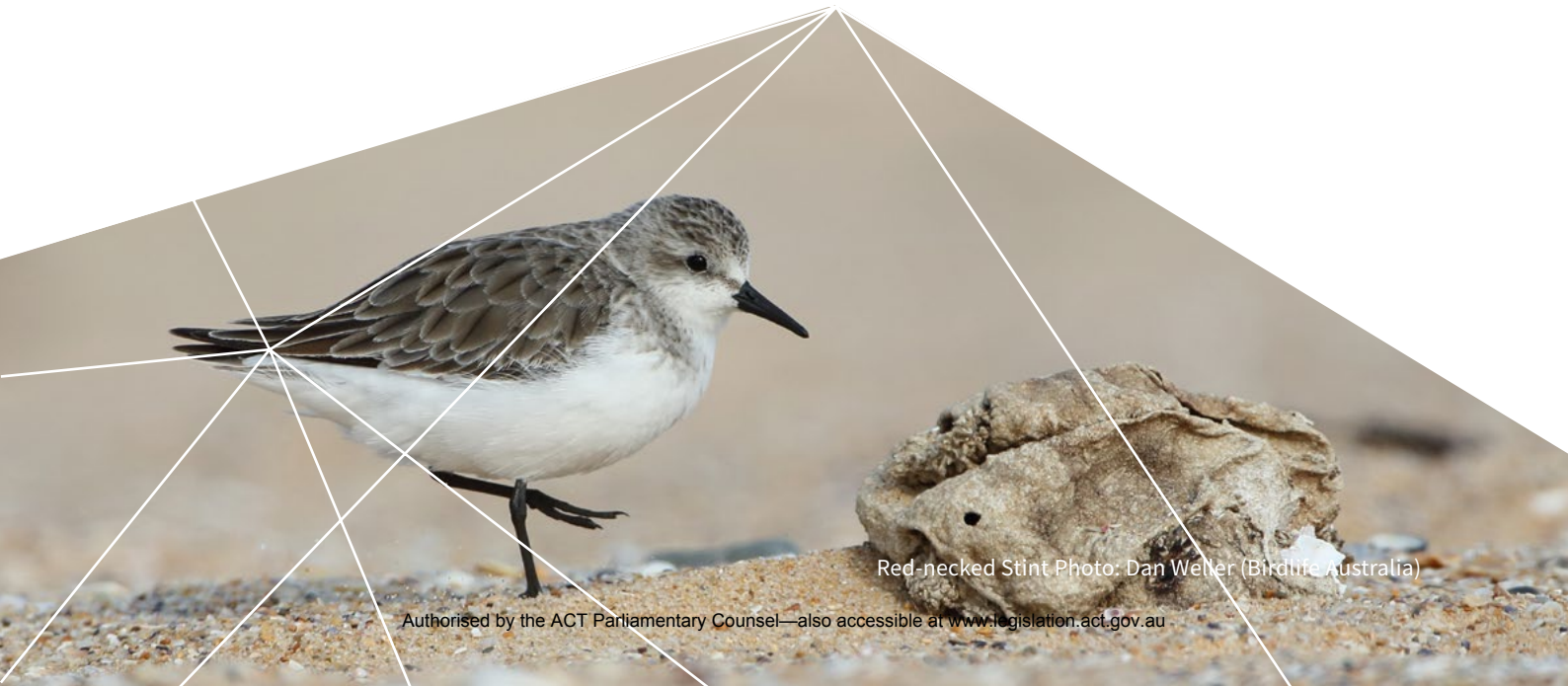


Red-necked Stint (*Calidris ruficollis*)

Location	Conservation status
International	Listed as Near Threatened (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Migratory shorebird, one of 35 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.

Features	Description
Size:	13–16 cm.
Body:	a tiny plain grey-brown and whitish shorebird, with black legs and straight, gently tapering black bill, slightly swollen at the tip.
Plumage Non-breeding:	A shadowy dark line from bill through to the eye separates a small white area over bill and a subtle whitish eyebrow from whitish throat. Upper parts are grey-brown with fine dark shaft-streaks; the underparts are whitish with grey-brown on the side of upper breast.
Breeding:	The face, throat, neck and upper breast are plain salmon-pink to pinkish chestnut; leaving a small pale area at the base of the bill. The feathers of the back and mantle are grey with black centres at first ('pre-breeding'); they then acquire bright chestnut and white fringes. Wing coverts and the tertiary feathers remain mostly grey-brown.
	Juvenile: Juveniles are like non-breeding birds, but brighter, with warm buff feather margins, especially on the mantle, upper wing-coverts and the tertials.[1]
Juvenile:	Juveniles are like non-breeding birds, but brighter, with warm buff feather margins, especially on the mantle, upper wing-coverts and the tertials.
In flight:	A strong white wing bar diffuses on blackish primary feathers. The sides of the rump are white; the rump and centre of the tail are black and pointed.
Voice	The voice is a weak 'chit, chit' or quick, high-pitched trill. When feeding, constant twitterings.

1 Tertials are the flight feathers borne on the basal joint of a bird's wing



Red-necked Stint Photo: Dan Weller (Birdlife Australia)

Red-necked Stint (*Calidris ruficollis*)

Habitat
Birds occur on tidal mudflats, saltmarshes, sandy or shelly beaches, saline and freshwater wetlands on the coast and inland, salt fields and sewage ponds.

Behaviour and Ecology
The species occurs in small groups or large, dense flocks that plunge and wheel in the air. On landing they settle instantly to run about and feed with a sewing machine action.

The Red-necked Stint is omnivorous. In Australia it is known to forage on intertidal and near-coastal wetlands. It jabs and probes with its bill into the soft mud for small invertebrates. Birds forage on plant seeds (such as from *Ruppia* spp. and *Polygonum* spp.) and a range of marine worms, molluscs, snails and slugs, shrimps, spiders, beetles, flies and ants. Birds sometime feed in dense flocks that spread out as the tide recedes. They often feed with other species, especially Sharp-tailed Sandpipers, *Calidris acuminata*, and Curlew Sandpipers, *Calidris ferruginea* (Higgins and Davies 1996).

The Red-necked Stint breeds in Siberia and west Alaska and then migrates to non-breeding areas south of 25° S in south-east Asia and Australasia. The Red-necked Stint usually lays four eggs (sometimes three) and both parents incubate the eggs for around 20–22 days. The female parent leaves soon after hatching but the male remains and usually tends the chicks for 16–17 days until they fledge. The Red-necked Stint probably breeds for the first time at two years of age, though first-year birds that remain in Australia during winter sometimes show traces of breeding plumage (Higgins and Davies 1996).

Distribution and Abundance
The Red-necked Stint has an EAA population estimate of 475,000 (Australian Government Department of the Environment 2016).

During the non-breeding season, over 80% of the global population resides in Australia, mostly in coastal areas. In south-east Australia, birds may occur on inland wetlands during October and November, moving to coastal environments by December. All important sites during the non-breeding period are located in Australia.

Birds arrive in Australia from August (and possibly July), with most from early September. Birds leave Australia from late February or March through to April. A few, however, may remain until May (Higgins and Davies 1996).

Formerly, numbers of this species in Australia were at a peak in 1980s. There was a decline in the abundance of the species in Australia during the early 1990s due to poor breeding success in the Northern Hemisphere (Watkins 1993). More recent counts indicate an increasing population due to recent successful breeding (Rogers and Gosbell 2006).

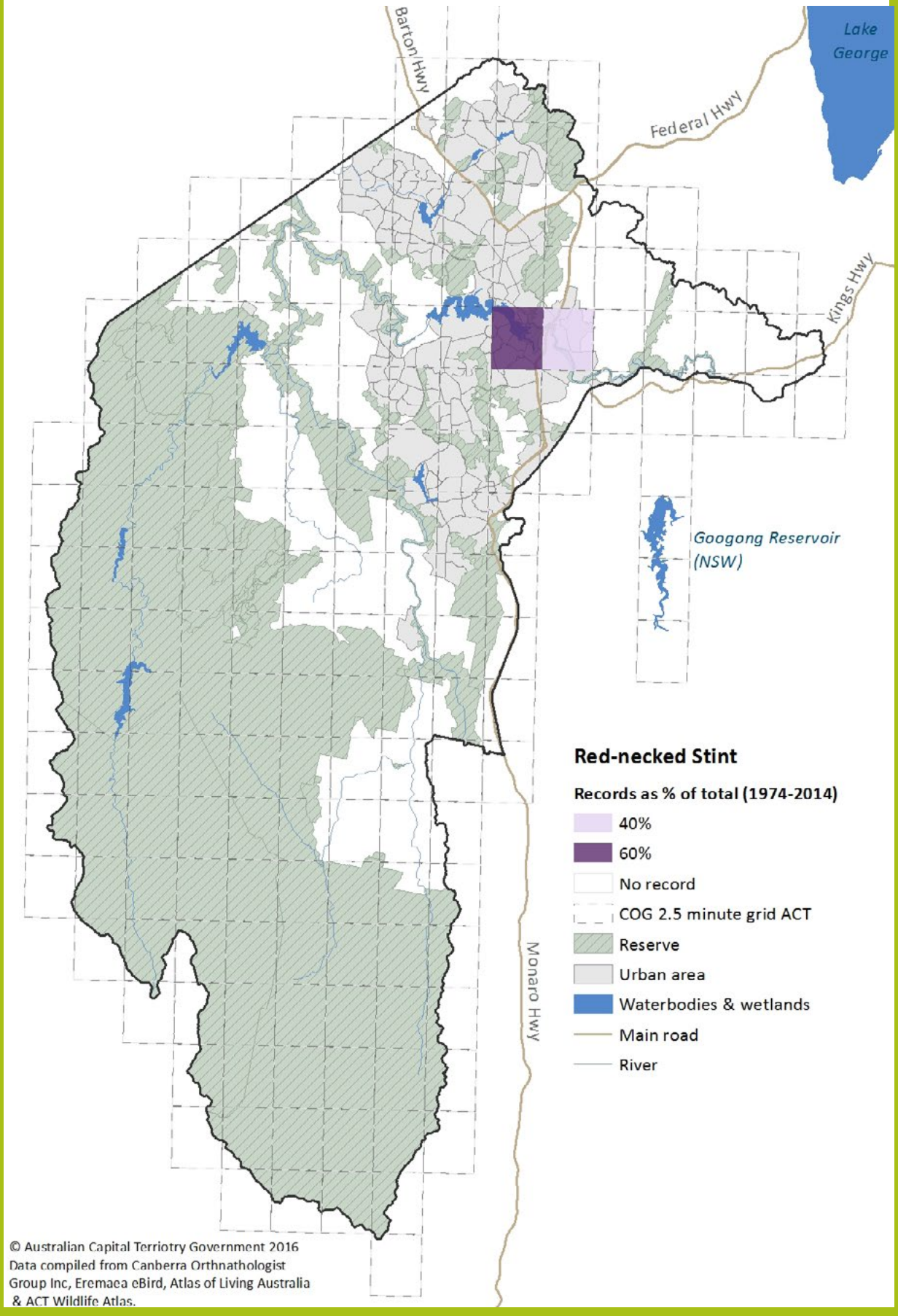
ACT occurrence
There are usually some records of this species in the ACT and region every year (except in 2002–03). Overall the Red-necked Stint is the eighth most regular shorebird visiting the ACT, being recorded here in 17% of years (Australian Wildlife Services 2016 *unpubl.*).

Records of this species in the ACT are confined to Fyshwick Sewage Ponds (68%) and JWNR (Kellys Swamp, Jerrabomberra Pool, and Shoveler Pool) (32%). In the nearby ACT region, most observations of this species are from Lake Bathurst or The Morass, with lower numbers at Lake George, especially when the lake bed is dry.

Observations of this species in the ACT are usually of one or two birds, although they are often observed in the company of other migratory shorebird species, typically the Sharp-tailed Sandpiper or the Curlew Sandpiper. Larger flocks of the Red-necked Stint may be seen in NSW at either Lake Bathurst (315 birds recorded in January 1988 (CBN 14:3, 63)), The Morass (380 birds recorded on 18 March 2000 (CBN 26:4, 118)) or Lake George (91 birds recorded on 6 March 2014 (CBN 39:1, 38)).

There appears to be a recent increase in the numbers of birds recorded locally in the ACT and region over the 2011–2014 period, although this may be due to an increase in observer effort. For example, a '600% increase' in abundance was reported for the 2013–14 year (CBN 39:1, 38), with a similar number of records, but a halving in the average number seen from 22.7 to 10.7, median 1.5 in 2014–15 (CBN 41: 1, 39). The numbers may also reflect a recent recovery in numbers observed elsewhere in Australia, which has been attributed to a recovery in breeding success (Rodger and Gosbell 2006).

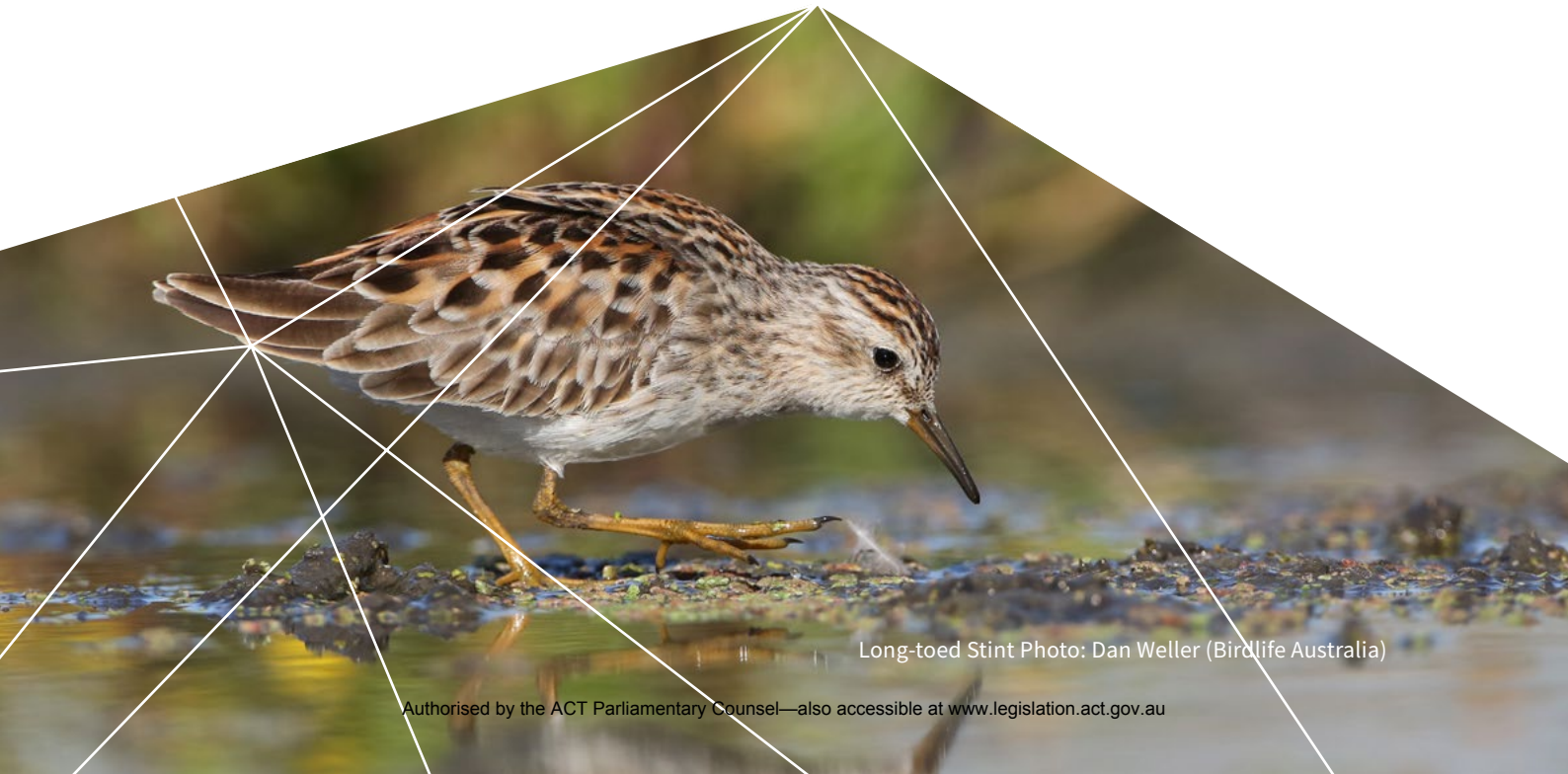
Figure 15: Recorded distribution of the Red-necked Stint (*Calidris ruficollis*) in the ACT



Long-toed Stint (*Calidris subminuta*)

	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Migratory shorebird, one of 35 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Listed as Least Concern. Action Plan for Australian Birds 2010 (Garnett et al.2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
SA	Rare. (*National Parks and Wildlife Act 1972*: June 2011).
VIC	Non-statutory: Near Threatened. (Advisory List of Threatened Vertebrate Fauna, Victoria: 2013).

Features	Description
Size:	13–15 cm.
Body:	Like a tiny, neat, long-necked Sharp-tailed Sandpiper, with slender long, greenish yellow (olive or grey) legs and long central toe. Short, blackish bill may have yellow, brown or greyish base.
Plumage Non-breeding:	The bird has a long white eyebrow, dusky mouse-brown above from the crown back. Blackish feather centres are margined buff-grey. The body is white below, streaked grey-brown across upper-breast.
Breeding:	Chestnut cap, some with split white eyebrow. The upper parts, including tertials, are black with buff/ chestnut/white margins. The breast is creamish, sharply streaked brown to flanks and the upper parts are whitish.
Juvenile:	Brighter, buffer with longer white eyebrow. Feathers of the upper parts are fringed orange-rufous. The white edges to scapulars may form a distinctive V on back, like the Little Stint.
Voice	The voice is a trilling ‘chee, ‘crreeet’ or ‘chreee-chreee’. Also, a chirrup, like the House Sparrow.



Long-toed Stint Photo: Dan Weller (Birdlife Australia)

Long-toed Stint (*Calidris subminuta*)

Habitat

Habitat for this species includes the tussocky, weedy margins of shallow wetlands on the coast and inland, sewage ponds and floating masses of seaweed on tidelines and tidal mudflats (Pizzey and Knight 2012).

Behaviour and Ecology

The Long-toed Stint is generally observed as single birds in the company of other shorebirds. In Western Australia, however, the species is observed in flocks of 100+ birds. The species flies in a zigzagging pattern.

The species is unobtrusive. It feeds slowly with a horizontal stance. It creeps with 'knees' bent, or with quick mouse-like runs and picks food from the surface, sometimes probing below the surface.

The diet of the Long-toed Stint is poorly known in Australia. The species is omnivorous, feeding on seeds, molluscs, crustaceans and insects. The birds mainly feed in freshwater, either singly or in small flocks. They have been sighted feeding in shallow water, on floating weed or algae, or in low vegetation with crouched or hunched posture. Birds may also forage in wet mud and among short grass, weeds and other vegetation on islets or around the edges of wetlands. They occasionally feed on open water, well away from the shore; this is more common in drying ephemeral wetlands (Higgins and Davies 1996).

The Long-toed Stint does not breed in Australia.

Distribution and Abundance

In Siberia, the species is found east of the Chukotsky Peninsula, on the Koryak Plateau, Komandorskiye Island, Kurile Island and the north coast of the Sea of Okhotsk and around Magadan, the north Verkhoyanskiy Mountains and the Ob and Irtysh rivers.

The species migrates through eastern Asia and is found in south-east China, Indochina, the Philippines, the Malay Peninsula, Indonesia and west to Burma. Small numbers have been reported on the Indian subcontinent and the Maldives in small numbers. It is a regular, but uncommon, visitor to New Guinea and Australia.

An estimated 230,000 Long-toed Stints occupy the EAA Flyway (Australian Government Department of the Environment 2016).

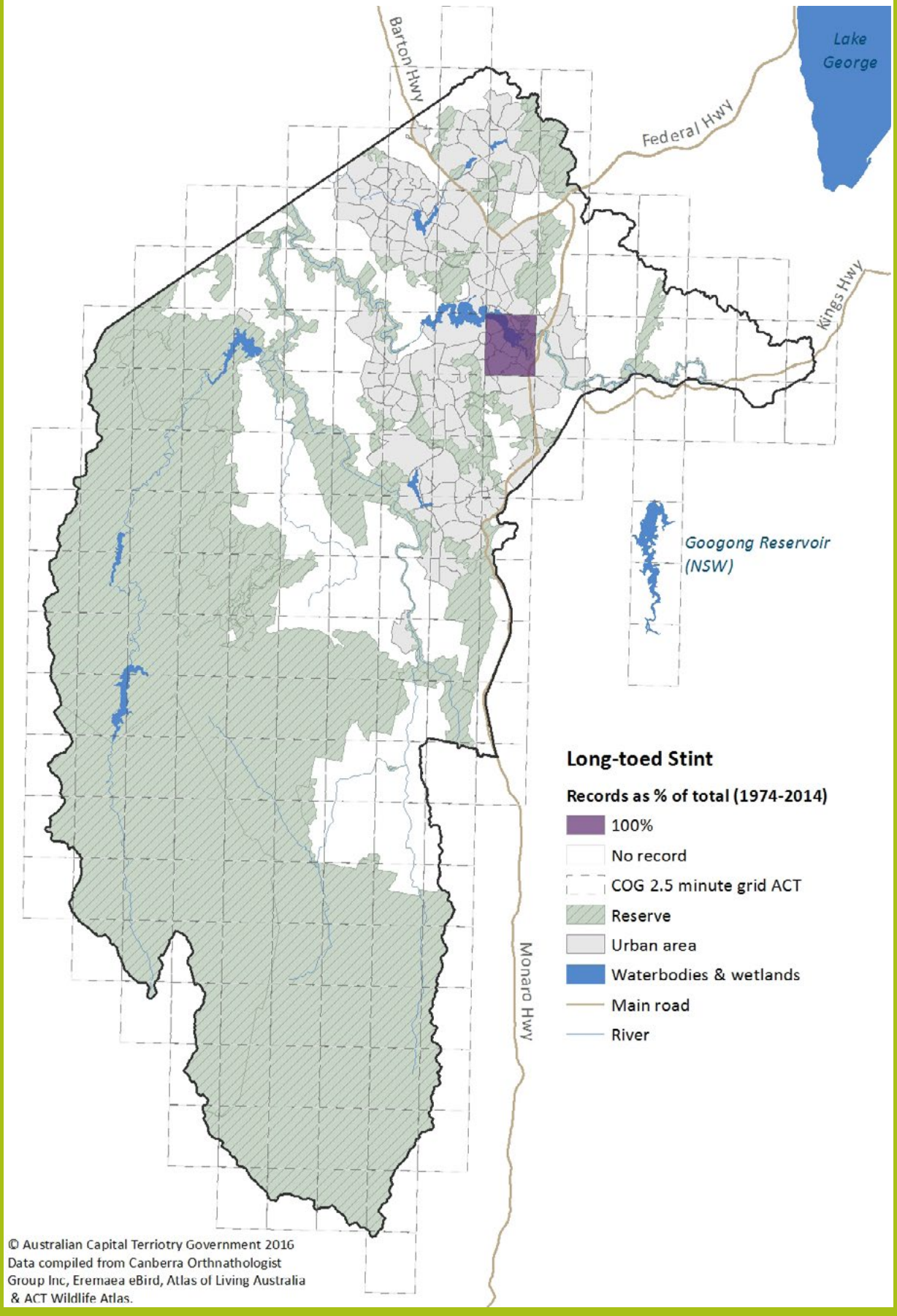
In Australia, the species was first recorded in 1886 near Lukins Crossing on the lower Fitzroy River, Western Australia. In Queensland birds have been recorded at Mount Isa, Lytton, Cairns and Dynevor Downs. In Tasmania, only a single record exists at Moulting Lagoon. In South Australia there are frequent records from Bool Lagoon, west to Big and Little Swamps. It is also found on the southern end of the Eyre Peninsula, with most records from The Coorong, Langhorne Creek, St Kilda and the Price Saltworks.

Inland records for the species are rare. The Long-toed Stint is irregular with widely scattered records in NSW. In Western Australia the species is found mainly along the coast, with a few scattered inland records (Higgins and Davies 1996).

ACT occurrence

There are only a few records of this species in the ACT. The most recent and verified records (Canberra Bird Notes 28:1, 42) are 10 observations of a single bird from 6–11 December 2002. These sightings were at either Kellys Swamp or Jerrabomberra Billabong within JWNR. On both 7 and 8 December 2002, a bird was seen in the company of a single Pectoral Sandpiper, *Calitris melanotos* (eBird, 2016).

Figure 16: Recorded distribution of the Long-toed Stint (*Calidris subminuta*) in the ACT



Pectoral Sandpiper (*Calidris melanotos*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, JAMBA, ROKAMBA.
	Migratory shorebird, one of 35 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al.2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
SA	Rare. (*National Parks and Wildlife Act 1972*: June 2011)
VIC	Non-statutory: Near Threatened (Advisory List of Threatened Vertebrate Fauna, Victoria: 2013).

Features	Description
Size:	19–23 cm. Males are larger, some noticeably so.
Body:	The bill is slightly longer than the head, heavier and olive-yellow at base, slightly decurved and tipped dusky. The legs are pale to deep yellow. The bird is usually brighter than the Sharp-tailed Sandpiper.
Plumage Adult	Heavy brown or blackish streaking or mottling on neck and breast cut-off sharply by whitish under parts.
Juvenile:	Juveniles have a pale eyebrow, often split. Chestnut fringes to the tertiary feathers are darker than the immature Sharp-tail Sandpiper's. There is a suggestion of a white 'V' on the upper parts.
Voice	The voice is a deep, reedy, musical 'chirrup', like a Budgerigar.

Pectoral Sandpiper Photo: Dean Ingwersen (Birdlife Australia)

Pectoral Sandpiper *(Calidris melanotos)*

Habitat
Habitat includes shallow fresh waters to saline wetlands with low grass or other herbage. It also includes river pools, creeks, floodplains, the margins of swamps, flooded pastures. The species uses sewage ponds and other artificial wetlands and occasionally uses tidal areas and saltmarshes.

Behaviour and Ecology
The species occurs as solitary birds or with Sharp-tailed Sandpipers. They occasionally occur in small flocks.

In flight, the species zigzags like a snipe, uttering distinctive calls.

The Pectoral Sandpiper is omnivorous, consuming algae, seeds, crustaceans, arachnids and insects. They move slowly while feeding, probing shallow water or soft mud at the edge of wetlands with rapid strokes (Higgins and Davies 1996).

The Pectoral Sandpiper breeds in northern Russia and north America. In Russia, its breeding distribution is from the Yamal Peninsula, east along the Arctic coast, through the Deltas of Lena and Kolmyra Rivers, to the Chukotsky Peninsula. In North America, its breeding distribution extends from Goodnews Bay to Point Barrow, the northern regions of Yukon and Mackenzie, north Baffin Island and Hudson Bay. The Pectoral Sandpiper does not breed in Australia.

Distribution and Abundance
The species migrates through Central America and the Caribbean to non-breeding areas in South America (Peru, Bolivia, south to south-central Chile, southern Brazil and Argentina).

The species occurs in small numbers through east Asia (Higgins and Davies 1996). In the tropical Pacific, there are scattered records from Hawaii, Polynesia, Micronesia and Australasia.

In Queensland, most records for the Pectoral Sandpiper occur in North Queensland around Cairns, with scattered records elsewhere. In South Australia, it is found mostly in the south east and the Yorke Peninsula. In the Northern Territory, the Pectoral Sandpiper is found at Darwin and Alice Springs (Higgins and Davies 1996). In Victoria, it is found from Port Phillip Bay and the Murray River valley.

In NSW, occurrence is widespread but scattered, occurring east of the Great Dividing Range, from Casino to Ulladulla in the state's south. The species is widespread in the Riverina and Lower Western regions. It is very rare in Tasmania.

ACT occurrence
The species has been recorded in 11% of years in the ACT (Australian Wildlife Services 2016 unpubl.). Typically, there has been a run of years when it has been recorded, followed by years when it is not present.

Records within the ACT are from Kellys Swamp within JWNR or at the nearby Fyshwick Sewage Ponds. Most records are of a single Pectoral Sandpiper in the company of other shorebird species.

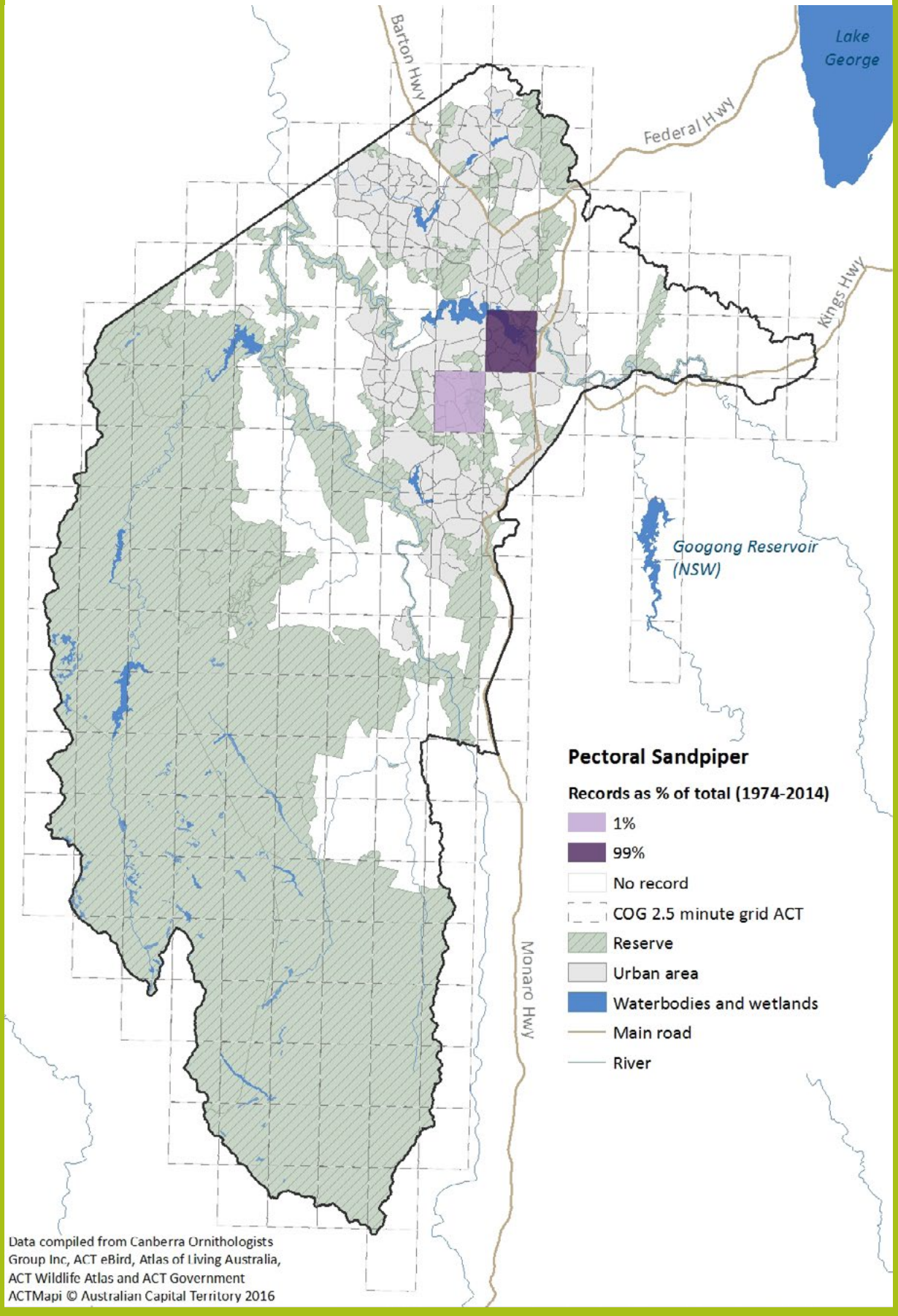
Individual birds may be observed over several weeks or months in the spring and summer months.

The first confirmed ACT record was at 'Kellys Farm' on 17 September 1972 (CBN 2:4, 19). The species was observed on 28 November 1977 at Kellys Swamp (NSW Bird Atlassers 2014, 2016) and 28 November 1978 at Lake Burley Griffin (NSW Bird Atlassers 2014, 2016). A single Pectoral Sandpiper was recorded several times during the 2002–03 summer months at Kellys Swamp, JNWR (CBN 28:1, 43). The species was observed at JWNR on 15 January 2005 (NSW Bird Atlassers 2014, 2016, ALA 2015).

Low and irregular numbers of this species have been observed at nearby Lake George and Lake Bathurst (West) in NSW, sometimes in years where the species is not observed in the ACT (CBN 24:2, 71; CBN 24:2, 100; CBN 33:1, 20; CBN 39:1, 38; NSW Bird Atlassers 2014, 2016).

Recent observations in the summers of 2013–14 and 2014–15 within the region have been at Kellys Swamp, JWNR and the nearby Fyshwick Sewage Ponds (eBird 2016; CBN 39:1, 38).

Figure 17: Recorded distribution of the Pectoral Sandpiper (*Calidris melanotos*) in the ACT



Sharp-tailed Sandpiper (*Calidris acuminata*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Migratory shorebird, one of 35 species utilising the EAA Flyway and subject to the Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2015b).
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Uncommon, non-breeding vagrant (COG 2014).
NSW	Not listed.

Features	Description
Size:	17–21 cm. Males larger, some notably.
Body:	Much variation in size. The bill is straight or slightly decurved. It is pale grey-brown and seldom longer than head. Legs are dull olive-yellow, yellow or olive-grey.
Plumage Non-breeding:	The head is a dull chestnut with a dark eyeline that widens and becomes browner on the ear-coverts and accentuates a pale rear eyebrow. Long feathers of upper parts have pointed dark centres, pale grown margins. Under parts are whitish-buff, with a sparsely streaked brown.
Breeding:	The long dark feathers of upper parts have rufous and buff-white edges. The neck and upper breast are buffish with a heavily-streaked brown. There are scattered dark 'boomerangs' on the lower breast and along the flanks.
Juvenile:	Have a bright rufous cap on the head isolated by large whitish rear eyebrow. The feathers of upper parts are buff yellow and white with chestnut on the margins. The feathers on the neck and breast are washed orange-buff, with fine dark streaks.
In flight:	A slight whitish wing bar is visible. The tail is wedge-shaped; dark-brown in the middle, brownish at the sides. The toes protrude slightly beyond the tail tip. The rump is dark-brown with white sides.
Voice	On taking flight, the voice is a dry 'trit-trit or a musical twitter, 'trrt wheeteet'.

Sharp-tailed Sandpiper Photo: Dan Weller (Birdlife Australia)

Sharp-tailed Sandpiper (*Calidris acuminata*)

Habitat
Coastal habitat includes tidal mudflats, saltmarshes and mangroves. Inland habitat includes shallow fresh, brackish or saline wetlands, floodwaters, irrigated pastures and crops. Built habitat includes sewage ponds and salt fields (Pizzey and Knight 2012).

Behaviour and Ecology
Birds occur in small groups of 2 to 10 or more, or in flocks of hundreds with other shorebirds. Birds may occur singly.

Sharp-tailed Sandpipers forage at the edge of the water of wetlands or intertidal mudflats, either on bare wet mud or sand, or in shallow water. They also forage among inundated vegetation of saltmarsh, grass or sedges. After rain, they may forage in paddocks of short grass, well away from water.

The Sharp-tailed Sandpiper forages on seeds, worms, molluscs, crustaceans and insects. They are also reported to eat arachnids and dead fish (Barker and Vestjens 1989; Higgins and Davies 1996). The species has been recorded eating a range of plant seeds, including *Paspalum spp*., *Trifolium spp*. (clover), *Medicago sativa* (Lucerne), *Ruppia spp., Chenopodium spp*. (goosefoot) and *Polygonum spp*. (knotweed). They also ingest grit, sand and charcoal.

The Sharp-tailed Sandpiper breeds in northern Siberia from the delta of the Lena River, east to Chaun Gulf and east of the Kolyma River delta. They migrate in flocks of less than a thousand to eastern Mongolia, China, Korea, Japan, Micronesia, Philippines and south-east Asia, and less so in the Philippines, Burma, Malay Peninsula, Borneo, and Melanesia.

The Sharp-tailed Sandpiper departs the breeding grounds from late June, with most leaving during July. They move overland through Mongolia, China and Manchuria to coastal Asia, with large numbers occurring in Korea between August to October and Japan. After arriving in Australia, most birds move slowly south across the continent to south-east Australia.

The Sharp-tailed Sandpiper departs non-breeding grounds in Australia by April and is one of the first waders to leave. They arrive in breeding grounds during late May.

Birds banded in Victoria have been recovered in eastern Siberia, east China and Taiwan (Higgins and Davies 1996).

Distribution and Abundance
An estimated 85,000 Sharp-tailed Sandpipers use the EAA Flyway (Australian Government Department of the Environment 2016). During the non-breeding season, approximately 91% of the EAA Flyway population occurs in Australia and New Zealand.

In Australia, the species occurs mostly in the south-east and is widespread in both inland and coastal locations and in both freshwater and saline habitats. In Queensland, they are recorded in most regions; they are widespread along much of the coast and are very sparsely scattered inland, particularly in central and south-western regions.

They are widespread in NSW and Victoria, especially in coastal areas, but they are sparse in the south-central Western Plain and east Lower Western Regions of NSW, and north-east and north-central Victoria. In Tasmania, they mostly occur in coastal areas. In South Australia, they are widespread in the eastern half. They may also be found north of Lake Eyre.

In Western Australia, there are scattered records from the Nullarbor Plain and the southern areas of the Great Victoria Desert. In the Northern Territory they mostly occur in the north coastal regions and there are records of sparsely scattered inland records from the Tanami Desert (Higgins and Davis 1996).

ACT occurrence
Overall, the Sharp-tailed Sandpiper is the second most regularly occurring shorebird in the ACT (after the Latham's Snipe) with records showing it has been recorded here in 78% of years over the last 40 years (Australian Wildlife Services 2016 *unpubl.*).

In years when the species has been recorded in the ACT, there were between one to five records each year up to and including 2001–02. Since that time to the present, there have been at least 10 or more ACT records each year, except for 2010–11, when there were no records.

Some 78% observations of this species in the ACT are within JWNR (including Kellys Swamp, Jerrabomberra Pool and Jerrabomberra Backwaters) with another 14% at the Fyshwick Sewage Ponds (CBN 40:1, 42).

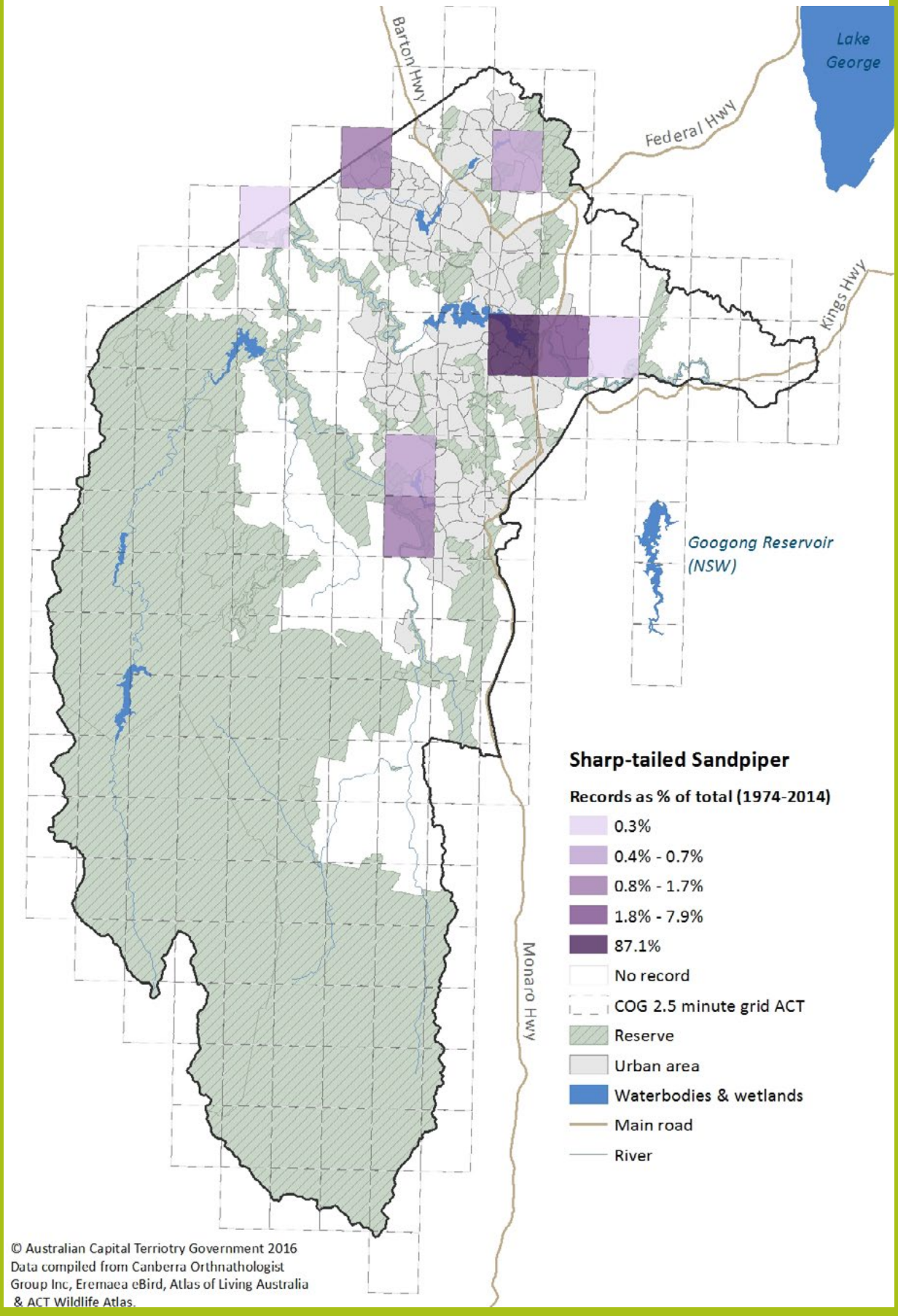
The species may occasionally be seen at other locations including Lake Burley Griffin East Basin, Norgrove Park Wetland, Mulligans Flat Dam, Ginninderra Creek, Canturf Turf Farm (Fyshwick), Mulwaree Road, West Belconnen Pond (eBird 2015), Gooromon Ponds (CBN 38:1, 33), Readymix Wetlands (CBN 28:4, 140) and Lake Tuggeranong (CBN 14:3, 62).

Larger groups tend to be seen at Fyshwick Sewage Pond compared to elsewhere in the ACT (e.g. 28 birds were seen on 26 October 2014 (eBird, 2015)). There are indications that the frequency of observations and abundance of this species in the ACT and region has increased significantly in recent years with 61 observations of this species at Fyshwick Sewage Ponds in calendar year 2014 compared to 32 in 2013 (eBird, 2015). There was also an increase in COG's index of abundance for this species (from 0.7 in 2012–13 to 1.6 in 2013–14, the highest abundance measure recorded for this species for 16 years) (CBN 40:1, 42). This trend was reflected in an increase in the number birds observed for the following year in 2014–15 (CBN 41:1, 39).

In the ACT region, outside the ACT, the most important habitat for the Sharp-tailed Sandpiper is provided by nearby Lake Bathurst and Lake George. The species has been recorded there every year since 1985–86, although the frequency of observations and the numbers seen have varied widely. Lake George has been identified as one of 11 sites in NSW which are regarded as important for this species during the non-breeding season in Australia (Bamford et al.2008), however records of the Sharp-tailed Sandpiper compiled by COG as part its ongoing Waterbird Survey (WBS) consistently show Lake Bathurst as being more important than Lake George, possibly because Lake Bathurst has been less often dry. Large flocks of birds have been observed at Lake Bathurst (e.g. 708 on 21 January 2012 at Lake Bathurst East Basin (CBN 39:1, p 38) and 2206 on 26 January 2014) (CBN 40:1, 42).

There is indirect evidence that some birds may sometimes over-winter in the ACT region with records at Lake Bathurst showing the Sharp-tailed Sandpiper present in every month of the for 1993–94 reporting year, except for July (CBN 23: Supp, 25).

Figure 18: Recorded distribution of the Sharp-tailed Sandpiper (*Calidris acuminata*) in the ACT



Curlew Sandpiper (*Calidris ferruginea*)

Location	Conservation status
International	Listed as Near Threatened (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn, CAMBA, JAMBA, ROKAMBA.
	Critically Endangered. *Environment Protection and Biodiversity Conservation Act 1999* (Cth.).
	A conservation advice has been prepared and approved (Australian Government 2015b).
	Non-statutory: Listed as Vulnerable. Action Plan for Australian Birds 2010 (Garnett et al.2011).
ACT	Non-breeding vagrant (COG 2014).
NSW	Endangered. (*Threatened Species Conservation Act 1995* (NSW), August 2016).
NT	Vulnerable. *Territory Parks and Wildlife Conservation Act 2000* (NT), 2012.
WA	Vulnerable. *Wildlife Conservation Act 1950* (WA), November 2015.
VIC	Non-statutory: Endangered. (Advisory List of Threatened Vertebrate Fauna in Victoria: 2013).

Features	Description
Size:	20–22 cm. Female, bill longer
Body:	An elegant, medium-sized shorebird with slim, longish, evenly downcurved black bill and longish black legs.
Plumage Non-breeding:	Uniformly grey-brown plumage with a long white eyebrow and white rump.
Breeding:	A pale patch around the bill. The head and body are a deep rosy chestnut. The upper parts are richly marked buff, chestnut and black. The white rump is darker and sparsely barred. Moulting birds show patchy, scaly, chestnut pattern.
Juvenile:	Juveniles are buffer; the upper parts are neatly 'scaly' from fine whitish feather margins.
In flight:	Birds show bold white wing bar and white rump.
Voice	The voice is a liquid 'chirrup'. In aerial chases, the voice is a musical 'tirri-tirri-tirri'.

Curlew Sandpiper. Photo: Dan Weller (Birdlife Australia)

Curlew Sandpiper (*Calidris ferruginea*)

Habitat

Habitat includes tidal mudflats, saltmarsh, salt fields, fresh, brackish or saline wetlands, and sewage ponds (Pizzey and Knight 2012).

Behaviour and Ecology

Birds occur in small to large flocks often with other shorebirds.

The Curlew Sandpiper forages mainly on invertebrates, including worms, molluscs, crustaceans, and insects, as well as seeds. The species usually forage in water, near the shore or on bare wet mud at the edge of wetlands. They probe in shallow water, and jab at the edge of the water where a film of water remains on the sand. They glean from mud, from the surface of water or, in drier areas, above the edge of the water. They often forage in mixed flocks (Dann 1999), including with Red-necked Stints (*Calidris ruficollis*). They mix freely with other small waders when feeding and roosting (Higgins and Davies 1996).

In Siberia, nesting occurs during June and July (Hayman et al.1986). The usual nest of four eggs (Johnsgard 1981) is a cup positioned on the margins of marshes or pools, on the slopes of hummock tundra, or on dry patches in tundra (BirdLife International 2010).

Distribution and Abundance

The breeding range of the Curlew Sandpiper is mainly restricted to the Arctic of northern Siberia, including Yamal Peninsula east to Kolyuchiskaya Gulf, Chukotka Peninsula and New Siberian Island.

Birds migrate through Europe, North Africa, Kazakhstan, west and south-central Siberia, Ussuriland in eastern Russia, China, Taiwan, Japan, the Philippines, west Melanesia, Wallacea and New Guinea. During the non-breeding period they occur throughout Africa, south of southern Mauritania and Ethiopia, along the valley of the Nile River and in Madagascar. They also occur in Asia, from the coastal Arabian Peninsula to Pakistan and India, through Indomalaya, South East Asia and Indochina to south China and Australasia (Higgins and Davies 1996).

The global population size of the Curlew Sandpiper has been estimated to be 1,350,000 (Delany and Scott 2002 as cited in Bamford et al.2008). The population estimated to occur in the EAA Flyway is 90,000 (Australian Government Department of the Environment 2016).

In Australia, the species occurs around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period and also during the breeding season when many non-breeding one year old birds remain in Australia rather than migrating north.

ACT occurrence

The Curlew Sandpiper is only rarely recorded in the ACT. The published records are mostly for single birds seen at Kellys Swamp within JWNR; however, eight birds were seen together on 21 September 1972 (CBN 2:4,10) and there were three records of a single bird from 26–28 August 2004 (CBN 31:1 19) and two records, probably of the same bird on 16–17 September 2009 (CBN 36:1, 24). Recent observations show the same pattern, with one bird seen from 3–5 November 2013 at Kellys Swamp, Jerrabomberra Creek and at Fyshwick Sewage Ponds (CBN 40:1,42; eBird 2016).

Birds are also seen at Lake Bathurst or, more rarely, at Lake George. The Curlew Sandpiper has been recorded in 20 out of 25 years at Lake Bathurst by the COG Waterbird Survey (COG 2015b), usually in relatively small numbers. Exceptions were the monthly counts in earlier years: e.g. 190 birds were seen at Lake Bathurst in April 1987 (CBN 13:3, 77) and 200 were seen in October 1996 (CBN 24:2, 110). Since 2002, the numbers of Curlew Sandpipers seen at Lake Bathurst have declined significantly, reflecting the widespread and large population decline observed in southern Australia (over 50%) since the 1980s.

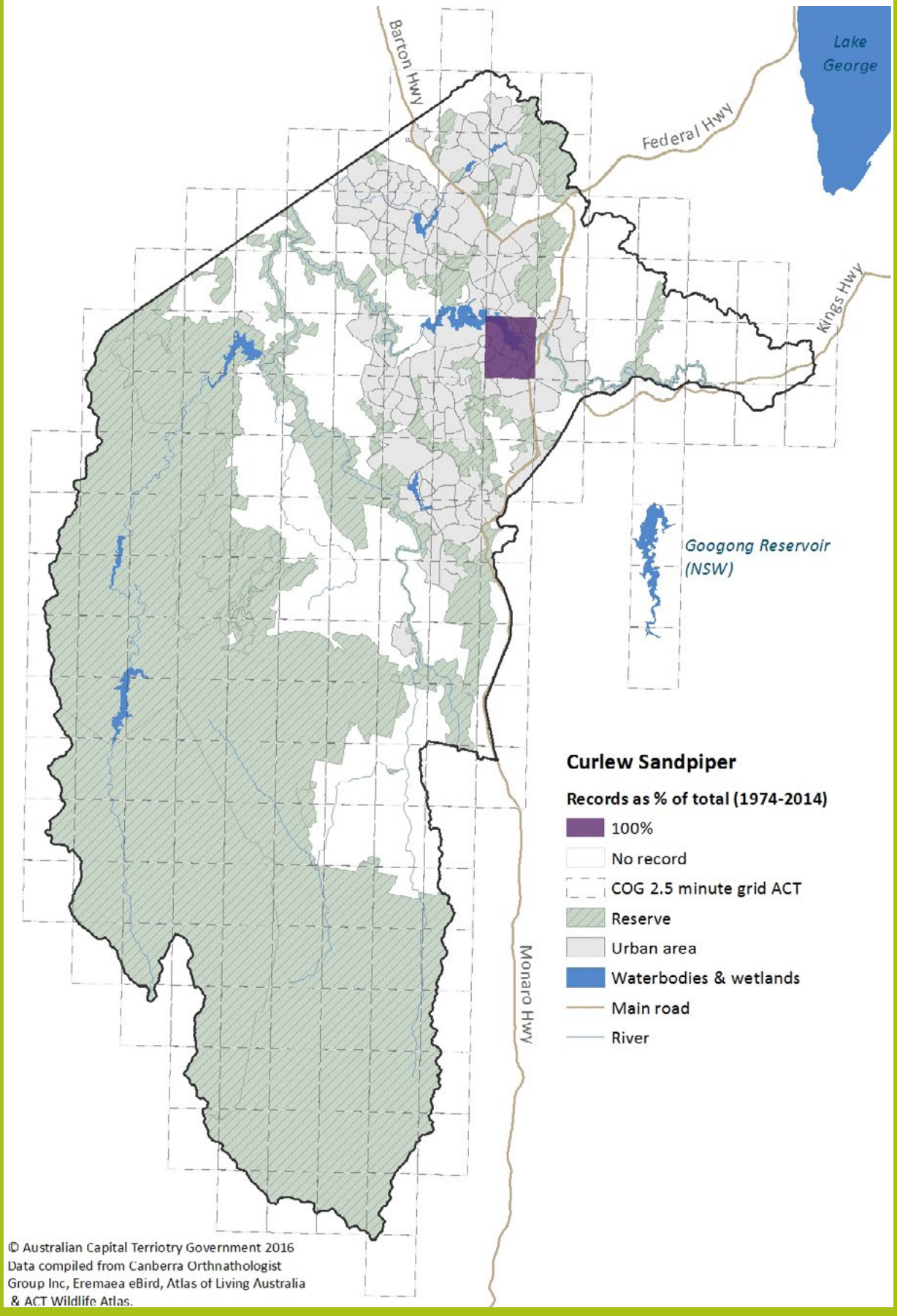
Specific Threats

Numbers have declined significantly prompting the declaration of this species as critically endangered under the EPBC Act (Garnett et al. 2011). Curlew Sandpiper populations are at their lowest level in 20 years in large areas of Australia, with a decline of over 50%. The main factors causing the decline occur outside Australia, mainly due to a succession of very poor breeding seasons in the Arctic in the decade preceding 2002 (Gosbell et al. 2002).

While the significant decline in the observed abundance has been attributed to poor breeding success in the Northern Hemisphere, there is also loss of feeding and roosting habitat occurring in Australia due to coastal development and recreational activities that are causing disturbance of the species. The shorebird community occurring at Taren Point has been listed as an endangered ecological community in NSW (NSW DECC 2005d) because of:

- fragmentation or isolation of sites within feeding areas
- human disturbance at roost and feeding sites
- disturbance by dogs at roost and feeding sites
- pollution.

Figure 19: Recorded distribution of the Curlew Sandpiper (*Calidris ferruginea*) in the ACT



8.3 WATERBIRDS

For the purposes of this plan, the waterbirds species–habitat group comprises only one species: the Glossy Ibis *Plegadis falcinellus*.

Two shorebird species, Latham's Snipe and the Double-banded Plover, overlap to some extent in their habitat requirements with the waterbirds species–habitat group, but they are classified as shorebirds.

Waterbirds can be widely distributed in the landscape, occurring in grassland, marshland, wetland, river shallows, irrigation areas and riparian sites. Species within this group also frequent saline of freshwater wetland or marshy areas, whether thickly vegetated or not, preferring flooded or swampy ground which may be close to, but also at a considerable distance from open water.

Waterbirds utilise rural stock grazing land and mown grass. Utilisation is usually restricted to actively irrigated areas close to natural wetland areas.

Within the ACT, suitable habitat occurs on public land, including at JWNR, and on rural leased land subject to grazing.

The major threat to waterbirds, in Australia and world-wide, is the loss and degradation of suitable wetland habitat due to their draining for agricultural use, development for other purposes, grazing, burning, salinisation, pollution and invasion by exotic plants and animals.

Human disturbance of waterbirds is another recognised threat, especially where waterbird populations are found close to urban areas.

Waterbirds are typically species that are communal users of roosting and nesting sites that may be susceptible to predation e.g. by cats and foxes. Temporary roosting sites in the ACT are most likely found close to the larger wetlands and water bodies e.g. Jerrabomberra Wetlands, lakes and ponds.

Some species are susceptible to disease e.g. Glossy Ibis is susceptible to avian influenza, so it may be threatened by future outbreaks of the virus.

Glossy Ibis Photo: Dan Weller (Birdlife Australia)

Glossy Ibis (*Plegadis falcinellus*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn.
	Non-statutory: Listed as Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Rare, non breeding visitor (COG 2014).
NSW	Not listed.
VIC	Listed as Near Threatened. (Advisory List of Threatened Vertebrate Fauna in Victoria, 2013).
SA	Listed as Rare. *National Parks and Wildlife Act 1972* (SA): June 2011 list.

	Description
Size:	48–61 cm. Wingspan: 90 cm
Body:	Smallest ibis known in Australia. At a distance, it looks like a black curlew. A distinctive long, downwards curved bill is olive-brown in colour. The neck is reddish-brown and the body is a bronze-brown with a metallic iridescent sheen on the wings.
Plumage Non-breeding:	Browner, duller; facial border less bold; head and neck streaked white.
Breeding:	Rich purplish brown, glossed bronze or green. Distinctive white line borders facial skin.
Juvenile:	Bill shorter, straighter; white mark on crown; plumage browner; pale mottlings on head and neck.
Voice	The voice is a long harsh, crow-like croak or grunts (Pizzey and Knight 2012).

Habitat

Habitat includes well-vegetated wetlands, wet pastures, rice fields, floodwaters, floodplains, brackish or occasionally saline wetlands, mangroves, mudflats, swamps, reservoirs, sewage ponds and, occasionally, dry grasslands. The Australian breeding habitat types include wooded and shrubby swamps (including Cooba (*Acacia stenophylla*), Eucalyptus/lignum swamps (*Muehlenbeckia florulenta*)) in the semi-arid and arid regions of the Murray–Darling Basin and in Melaleuca/reed swamps at near-coastal breeding colonies in the south.

Behaviour and Ecology

Birds occur singly, in pairs or in flocks of dozens to hundreds.

The bird flies in long, swift undulating lines, vees or bunches and often dashes about erratically, with sudden glides.

Glossy Ibis may be found in the company of other ibis such as the Straw-necked Ibis (*Threskiornis spinicollis*) or Australian White Ibis (*Threskiornis molucca*).

Birds feed in shallow wetlands, probing the water and mud with their long, curved bill and walking slowly and sedately (Marchant and Higgins 1990). The Glossy Ibis feeds mainly on aquatic invertebrates and insects such as freshwater snails, mussels, crabs and crayfish. The species will also, however, eat fish, frogs and tadpoles, dryland invertebrates (such as beetles and grasshoppers), lizards, small snakes and nestling birds. The seeds of aquatic plants may also be eaten, including commercial rice (del Hoyo et al. 1992; Marchant and Higgins 1990).

Glossy Ibis breed from mid-spring to the end of summer in mixed species colonies. The nest is a platform of twigs and vegetation and is usually positioned less than one metre above water (occasionally up to 7 metres) in tall dense stands of emergent vegetation (e.g. reeds or rushes), low trees or bushes (del Hoyo et al. 1992). Three to six eggs are laid. Both adults care for young who fledge in approximately 25–28 days (Hancock et al. 1992).

Distribution and Abundance

Worldwide, the Glossy Ibis occurs in eastern North America, from the Caribbean region. They also occur in Europe, Russia and Siberia, central Asia, south of the Sahara in Africa, Pakistan, India, Philippines, Indonesia, Papua New Guinea and Australia.

The Glossy Ibis is considered both migratory and nomadic (del Hoyo et al. 1992; Marchant and Higgins 1990), undergoing post-breeding dispersal.

The population of Glossy Ibis within Australia is estimated to be approximately 12% of the species' total population (Marchant and Higgins 1990) estimated to be between 1,200,000–3,200,000 worldwide (BirdLife International 2010).

The species occurs in north and east Australia and is most numerous in the north. Although the movement of the birds within Australia is often erratic, they are a regular spring-summer breeding migrant to southern Murray–Darling region (NSW, Victoria) and adjacent south-east South Australia.

ACT occurrence

The records of this species in the ACT and region are highly variable from year to year reflecting its nomadic and irruptive nature. In most years, there are few or no records, but there have been notable peaks of observations; for example, in 1995 there were 23 records, in 2003 there were 23 records, in 2013 there were 15 records and in 2014 there were 39 records. Over the three-year period from 2007–2009 there were 47, 14, and 11 records, respectively (COG 2014c; 2015b).

Sightings are usually of one or two birds and, generally, no more than five birds. However, there have been larger flocks recorded in earlier years e.g. there were 25 birds observed at Kellys Swamp in November 1982 and 22 birds observed in December 1982 (CBN 9:1,8).

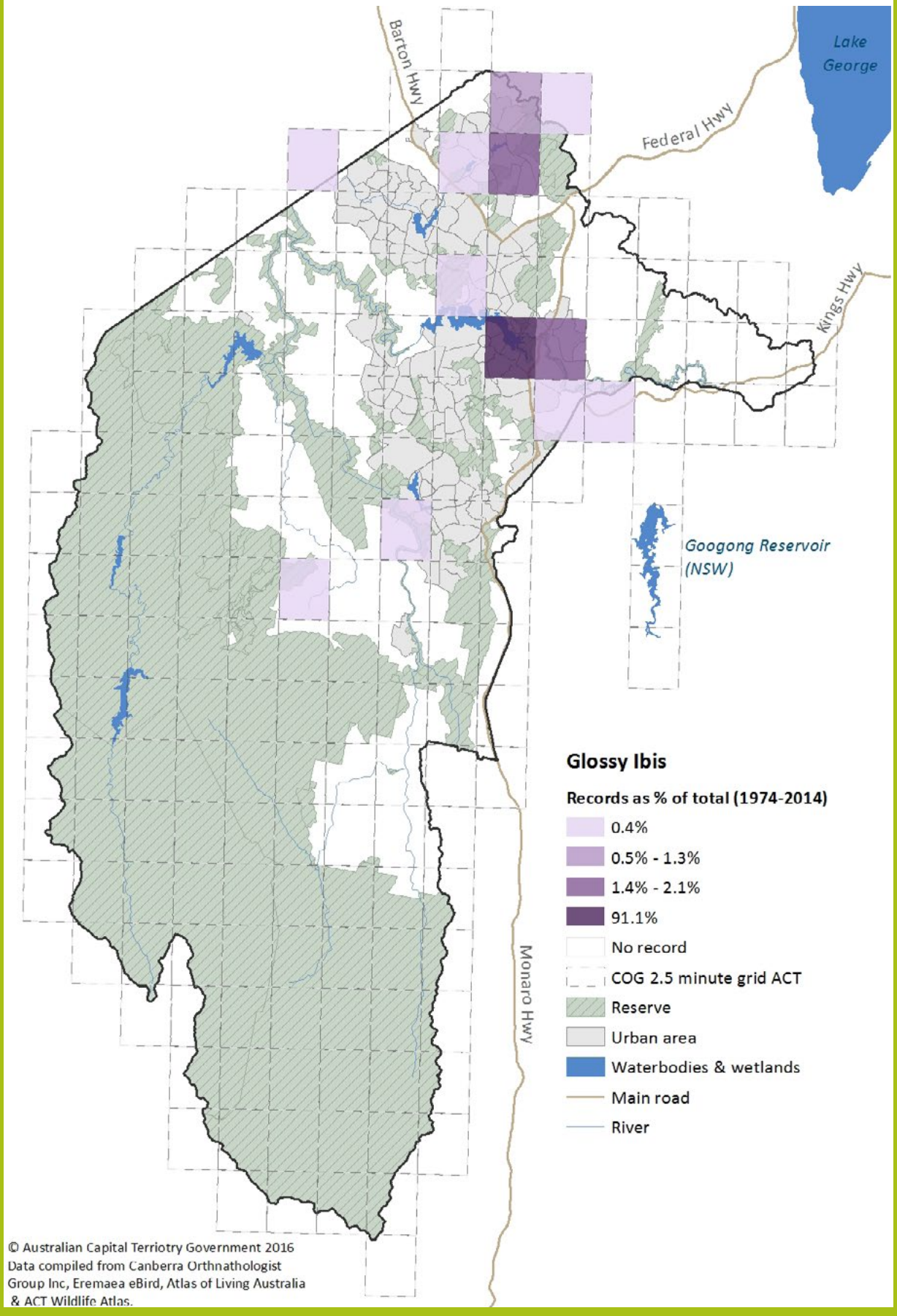
Historically, most ACT records (over 80%) have been from JWNR at Kellys Swamp and the nearby Fyshwick Sewage Ponds. Glossy Ibis have also been occasionally recorded at Jerrabomberra Pool and Jerrabomberra Backwaters in JWNR, Mulligans Flat NR and Dam, Molonglo River Flats, Duntroon, at pools behind the Causeway Tip, Black Mountain Peninsula, Lake Burley Griffin East, Point Hut Dam, Ngunnawal, Forde Ponds (eBird 2016) and Lyneham Wetlands (CBN 41:1, 26).

Specific threats

Wetland destruction or degradation, including through including water diversion and drainage and irrigation, are the major threats to the Glossy Ibis. For example, water diversion and drainage in the Macquarie Marshes resulted in a failure of Glossy Ibis to nest there (del Hoyo et al.1992; Hancock et al. 1992; Marchant and Higgins 1990).

Habitat modification through clearing, grazing, burning, increased salinity, groundwater extraction and invasion by exotic plants and fish species are also threats to the species. The bird is locally threatened in some areas by hunting and through use of pesticides (del Hoyo et al. 1992; Marchant and Higgins 1990). The species is susceptible to avian influenza, so may be threatened by future outbreaks of the virus (BirdLife International 2010). Human disturbance is a possible threat (Burger and Gochfield 1998).

Figure 20: Recorded distribution of the Glossy Ibis (*Plegadis falcinellus*) in the ACT



8.4 TERNS

This species–habitat group includes four species:

- Gull-billed Tern *Gelochelidon nilotica*
- Caspian Tern *Hydroprogne caspia*
- White-winged Black Tern *Chlidonias leucopterus*
- Common Tern *Sterna hirundo*

Terns are predominantly marine, pelagic and coastal in distribution in Australia and word-wide; however, several species also exploit inland freshwater or saline wetlands. Important habitat includes coastal and offshore waters, beaches, mudflats, estuaries, brackish wetlands, salt fields, estuaries and sandflats.

Terns forage exclusively by shallow plunge diving, taking their food on, or just below, the water surface. They are strong, long distance fliers, so several tern species are also able to exploit inland waterbodies, whether fresh or saline, using the same foraging technique.

There is only a limited extent of habitat suitable for these species in the ACT, so it is not significant for the viability of these species. Use of habitat in the ACT is opportunistic. Potential suitable habitat for terns may come from development of new urban lakes, ponds and wetlands that deal with stormwater runoff.

Only two of the four species, the Caspian Tern and the Gull-billed Tern, breed in Australia. Both species are open ground nesters and are, therefore, vulnerable to predation by native and introduced predators such as cats and foxes. They are also susceptible to disturbance by humans, but this is not significant as breeding usually occurs on remote islands and sandspits at coastal sites (e.g. Caspian Tern) or at remote locations on inland water bodies (e.g. Gull-billed Tern). Neither of the tern species breeding in Australia has been recorded breeding in the ACT; breeding related threats are, therefore, not relevant to the survival of the species here.

The Common Tern and the White-winged Black Tern both breed exclusively in the Northern Hemisphere.

All four tern species are threatened by loss of habitat and deterioration of the remaining suitable habitat, for example through wetland drainage, agricultural intensification, pesticide pollution, fluctuating water levels, beach erosion and development or modification of foraging sites.

All four tern species are susceptible to human-related disturbance at nesting sites or, more commonly, at important coastal foraging and roosting sites. For example, the protected Caloundra and Noosa sandbanks in south-eastern Queensland are major roosting and foraging sites for two species: the White-winged Black Tern and the Common Tern.

These sites are adjacent to large and growing population centres and are therefore subject to pressure from human recreational pursuits and tourism such as boating, kite-surfing, diving, fishing, bait gathering, jet-skiing and other motorised watercraft. Some of these activities are known to affect the behaviour of birds and threaten the use of these areas by terns (and other species).

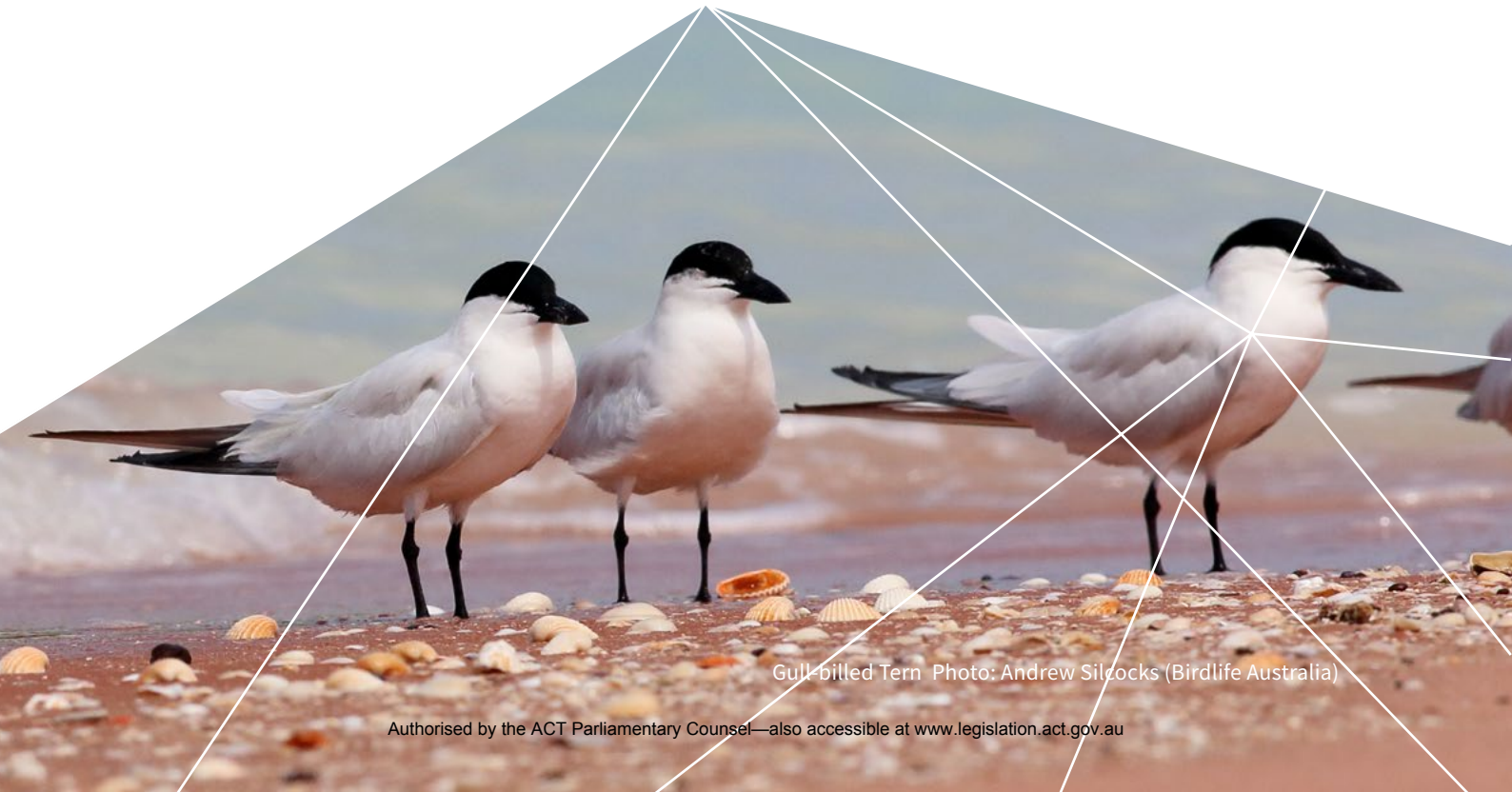
Poor weather and severe cyclones at these Queensland sites can be associated with irruptions and influxes by tern species to other parts of Australia including inland areas (Higgins and Davies 1996) and the ACT. The incidence of this kind of weather-induced dispersal is expected to increase in the future through climate change. Monitoring of dispersal events is important for the management of the species at Caloundra and Noosa sandbanks; monitoring dispersal elsewhere would increase knowledge of how species utilise the suitable habitat available on a national scale.

Caspian Tern Portland. Photo: Andrew Silcocks

Gull-billed Tern (*Gelochelidon nilotica*)

Location	Conservation status
International	Listed as Least Concern. (IUCN Red List of Threatened Species 2015).
National	Listed marine (as Sterna nilotica). Listed migratory: CAMBA.
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al.2011).
ACT	Non-breeding vagrant (COG 2014.
NSW	Not listed.
VIC	Threatened. Flora and Fauna Guarantee Act 1988 April 2015.

	Description
Size:	Size: 35–38 cm. Wingspan: 1.0–1.2 metres.
Body:	The Australian race, *G. n. macrotarsa*, has a shorter stouter bill than most terns. The bill is black and appears slightly down-curved. The legs are long and black. The migratory Asian race *G. n. affinis* is smaller; it has greyer wings and the back contrast with white upper tail-coverts. The bill is straight and stout. In Australia the bird is in non-breeding plumage.
Plumage Non-breeding:	The head is white with some remnant black streaks. There is a large black oval patch around the eye and across ear-coverts. The iris is brown.
Breeding:	The head has a black cap pulled down over the eyes.
Juvenile:	Juvenile birds are streaked darker on the crown; mottled above.
Voice	The voice is a throaty 'ka-huk', or a 'tirruck tirruck' (Pizzey and Knight 2012).



Gull-billed Tern Photo: Andrew Silcocks (Birdlife Australia)

Gull-billed Tern (*Gelochelidon nilotica*)

Habitat
Habitat includes fresh, brackish wetlands, including far inland wetlands. Habitat also includes beaches, mudflats, grassland, crops, sewage farms, ploughed fieldsand airfields. The species is only rarely found over the ocean (Pizzey and Knight 2012, Birdlife International 2010).

This species, together with other members of the genus Chlodonias, are collectively described as 'marsh terns', due to their preference for inland rather than coastal habitats.

Behaviour and Ecology
Birds occur singly or in small parties. The species hunts in the air for flying insects and dips into water bodies to take small insects or fish from the surface of the water or mud, but seldom plunges deeper into the water. When fishing, the Gull-billed Tern fans out its tail and flies with its wings outstretched, flapping occasionally. It glides gently down to the surface of the water, tilting its head downwards so its bill is nearly vertical and only the tip touches the water. After seizing its prey, the bird gains height rapidly and continues its slow hawk-like flight. It does settle on the water (Birdlife International 2010).

The diet of the Gull-billed Tern is varied, consisting mainly of small fish, reptiles, amphibians, crustaceans, small mammals, and insects and their larvae.

The species breeds from September to May, usually in small colonies on small islands in inland lakes. There are few breeding reports north of about 25 degrees south in latitude.

The nests are shallow depressions scraped in sand or mud lined with some vegetation. Both sexes incubate the eggs.

Distribution and Abundance
The Gull-billed Tern has a cosmopolitan, world-wide distribution, except for Antarctica.

The species is mostly sparsely distributed across Australia, but is present in all months along the east coast of Australia, south to the Hunter River in NSW.

The species is a breeding visitor to south-east Australia in the Australian summer. It breeds well inland and in Western Australia when conditions are suitable. It is primarily a winter visitor to coastal northern Australia and is a vagrant to Tasmania, Lord Howe Island and New Zealand.

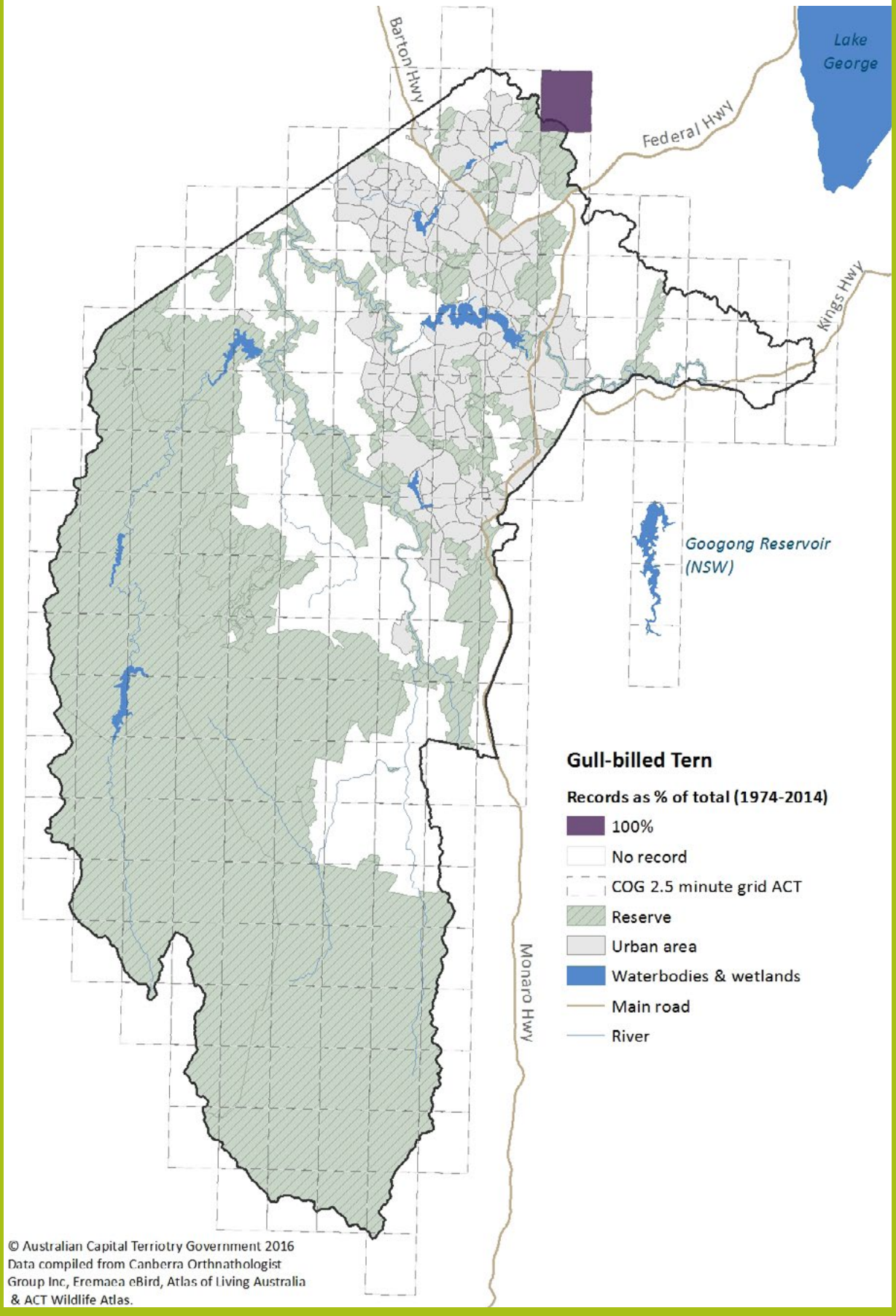
ACT occurrence
Gull-billed Terns have been recorded only three times in the ACT, all at Kellys Swamp in JWNR or close by at Lake Burley Griffin East. The first record for the ACT and region was on 17 September 1972 at Kellys Swamp, seen by five observers over four days. The birds were seen in the company of several migrant wader species: 28 Sharp-tailed Sandpipers, eight Curlew Sandpipers and three Greenshanks (CBN 2:4, 10).

The second record was at Lake Burley Griffin East, seven years later on 29 October 1979 (CBN 6:1, 19). The most recent record was of two birds at Kellys Swamp on 27 September 2002 along with an influx of up to 40 Whiskered Terns (CBN 27:3, 136).

All other records for the ACT and region have been at Lake Bathurst, NSW including the most recent sighting of one bird on 26 April 2015 at Lake Bathurst, East Basin (CBN 40:1, 43).

Specific threats
The Gull-billed Tern species is threatened by the deterioration and loss of habitat such as through wetland drainage, agricultural intensification, pesticide pollution, fluctuating water levels, beach erosion and development of modification of foraging sites. It also suffers from reduced reproductive success due to human disturbance at breeding colonies (del *Hoya* et al. 1996; Molina and Erwin 2006; Birdlife International 2015).

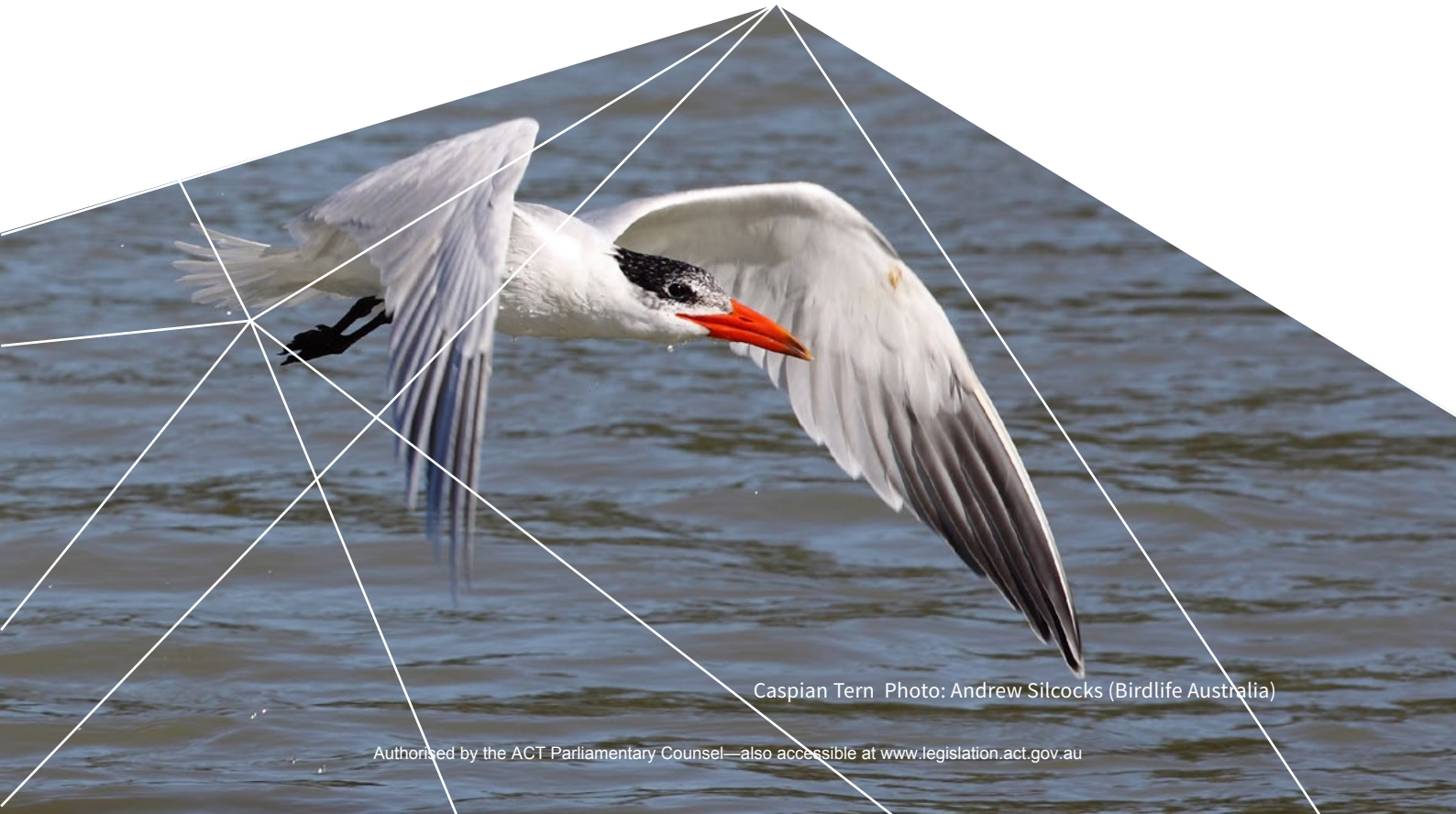
Figure 21: Recorded distribution of the Gull-billed Tern (*Gelochelidon nilotica*) in the ACT



Caspian Tern (*Hydroprogne caspia*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: CAMBA, JAMBA.
	Non-statutory: Least Concern. Action Plan for Australian Birds (Garnett et al.2010).
ACT	Non-breeding vagrant (COG 2014).
NSW	Not listed.
VIC	Threatened. Flora and Fauna Guarantee Act 1988, April 2015.

Featu	Description
Size:	48–55 cm. Wingspan: 1.1–1.4 metres.
Body:	Largest tern, with a robust scarlet bill.
Plumage Non-breeding:	The forehead is white. The rear crown and ear-coverts are streaked brownish.
Breeding:	The forehead and crown are black.
Juvenile:	The bill is orange with a blackish tip. The ear-coverts and crown are streaked blackish brown. The upper parts are mottled.
In flight:	Long wings are darker at the tip. The tail is short, white and slightly forked.
Voice	The voice is a deep, harsh ‘kraa-uh’ or ‘kah’.



Caspian Tern Photo: Andrew Silcocks (Birdlife Australia)

Caspian Tern (*Hydroprogne caspia*)

Habitat

Habitat includes coastal and offshore waters, beaches, mudflats, estuaries, larger rivers, reservoirs and some inland lakes (Pizzey and Knight 2012). Generally, roosting occurs on bare exposed sand or shell spits, banks or shores of coasts, lakes, estuaries, coastal lagoons and inlets (Higgins and Davies 1996).

Behaviour and Ecology

Outside of breeding, the Caspian Tern occurs singly or in small groups. Occasional larger groups of 30 or more birds are seen, often at rich fishing areas or at nightly roost sites, where they may roost with other terns. The species may also aggregate into flocks on passage (migration) (Higgins and Davies 1996).

The Caspian Tern's diet consists predominantly of fish (5–25 centimetres in length) as well as the eggs and young of other birds, carrion, aquatic invertebrates (e.g. crayfish), flying insects and earthworms (Birdlife International 2010). They forage diurnally, mostly early to mid-morning in open wetlands, including lakes and rivers. They prefer sheltered shallow water.

The Caspian Tern breeds throughout its range in North America, Europe, Africa, Asia, Australia and New Zealand, but at widely dispersed locations. Nests may be in the open, or among low or sparse vegetation, including herb field, tussocks, samphire or other prostrate sand-binding plants. Nests usually consist of a slight hollow scraped in the ground that is left bare or lined with grass, a few twigs, seaweed, feathers, small stones and shells. The clutch size is one–three eggs, usually two (Pizzey and Knight, 2012). In coastal southern Australia, breeding has been recorded during July to late February in various years. In northern Australia, there is no apparent fixed breeding season.

Breeding is recorded from the Menindee Lakes in NSW and there are known breeding sites in all other states and territories (Higgins and Davies 1996). No breeding has been recorded in the ACT or region.

Distribution and Abundance

The total global population of the Caspian Tern is estimated to be 240,000–420,000 birds with a cosmopolitan distribution (Birdlife International 2010).

Within Australia, the Caspian Tern has a widespread occurrence and can be found in both coastal and inland habitats. In NSW it is widespread east of the Great Dividing Range, mainly in coastal regions, but also in the Riverina and Lower and Upper Western regions, with occasional records elsewhere (Higgins and Davies 1996) and the ACT.

In Australia, the species is nomadic and part-migratory (Pizzey and Knight 2012). Some birds may move from coastal breeding colonies to inland non-breeding areas. They may follow watercourses inland, though their occurrence at small lakes indicates that at least some movements are overland (Higgins and Davies 1996).

ACT occurrence

Caspian Terns have been recorded rarely in the ACT. Most records are from Kellys Swamp (JWNR) and the immediate vicinity including Jerrabomberra Creek, the Fyshwick Sewage Ponds and the adjacent turf farm where two birds were seen on 27 September and 8 and 14 October 2003 (CBN 30:1,19). There have been several records for Lake Burley Griffin since its filling, including the first ACT record at Yarralumla Bay on 1 June 1969 (CBN 13:1,12) and recently at Sullivans Creek, Orana Bay (e.g. one bird was observed at Sullivans Creek on 10 September 2014 and a bird was observed at Yarralumla Bay on 13 October 2014 (eBird 2016)).

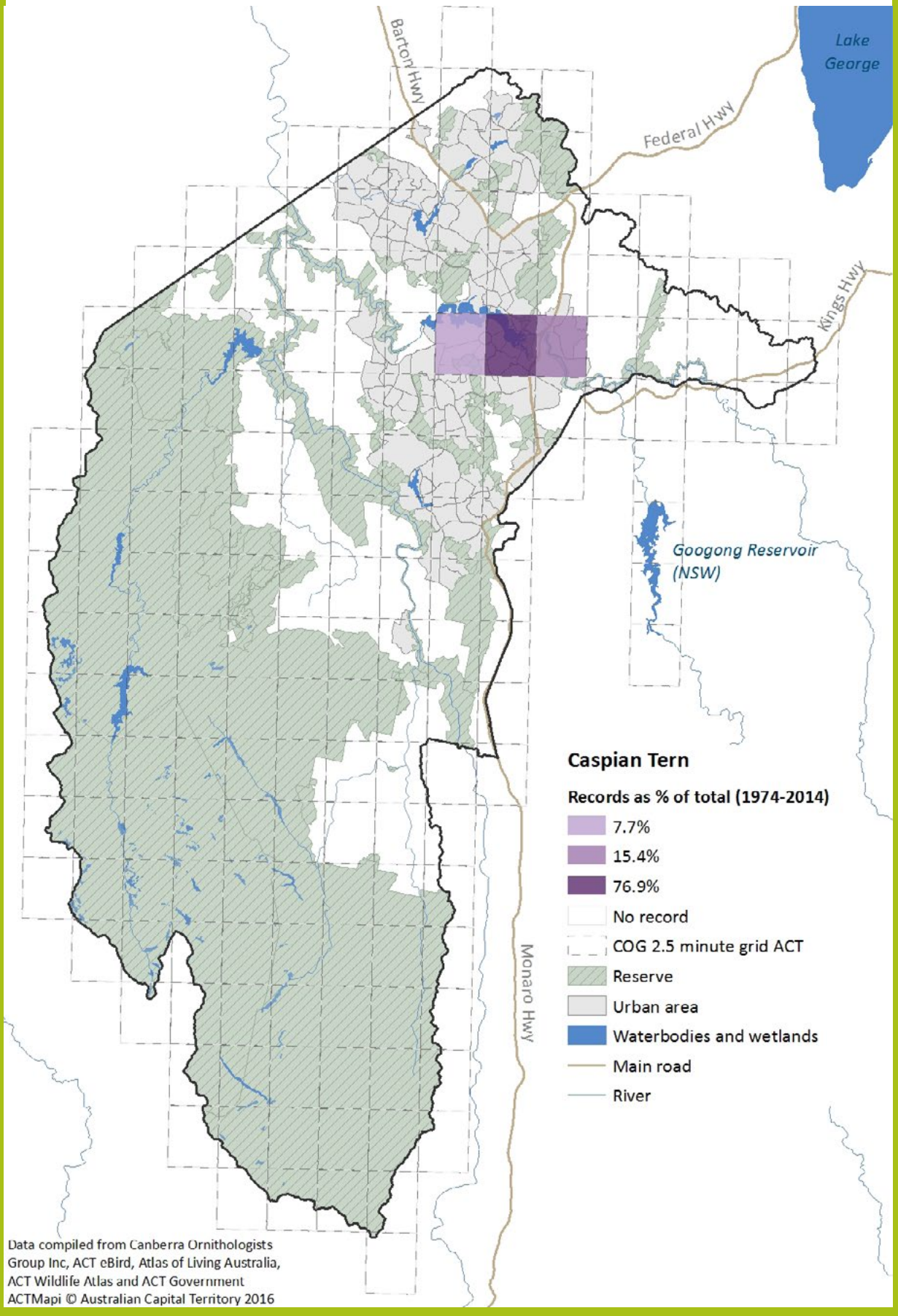
The species was recorded in the ACT over three consecutive years with 17 records of up to two birds observed between 2–5 January 2014 at JWNR (CBN 40:1, 43); six records of a single bird on 10 September 2015 at the Australian National University and at West Lake Burley Griffin; and records of a single bird on four occasions between 6–18 December 2015 at Fyshwick Sewage Ponds, JWNR and the ANU (CBN 41:1, 40).

The species has been similarly recorded only occasionally in nearby NSW. Three were sighted at Lake George on 3 September 1964 (CBN 13:1, 12), one at Lakes Road on 19 September 2011 (CBN 38:1, 34) and one at Lake Bathurst on 1 August 2005 (CBN 32:1, 21).

Specific threats

The major threats to the Caspian Tern are primarily to young terns at their breeding sites. Once Caspian Terns become adult they are a long-lived species.

Figure 22: Recorded distribution of the Caspian Tern (*Hydroprogne caspia*) in the ACT



White-winged Black Tern (*Chlidonias leucopterus*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed Marine. Listed Migratory: CAMBA, JAMBA, ROKAMBA
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011)
ACT	Non-breeding vagrant (endorsed by the COG Rarities Panel, November 2014)
NSW	Not listed.
VIC	Non-statutory: Near Threatened. (Threatened Vertebrate Fauna in Victoria: 2013)

Feature	Description
Size:	Size: 22–24 cm. Wingspan: 66 cm.
Plumage Non-breeding:	The bill is black and the legs are pinkish black. The head is smutty black with the crown extending onto the ear coverts (some only have dark patch only on ear-coverts). The white rear collar and whitish rump contrast with a grey back and tail. The underwings are whitish, or with patchy black coverts.
Breeding:	The bill and legs are red. The head and body are black. Wings are grey with white shoulders and black wing linings. Birds have a white rump and tail, white.
Juvenile:	Birds are black to mottled-dark brown. The rump is grey-white. The outer primary feathers of the wings are black with dark leading and trailing edges contrasting with a paler grey centre of upper wing.
Voice	The voice is a buzzing 'kee-eek', a rapid 'kik-kik-kik' or a sharp 'kik'.

White-winged Black Tern Photo: Dan Weller (Birdlife Australia)

White-winged Black Tern (*Chlidonias leucopterus*)

Habitat

Habitat includes large fresh, brackish or salt wetlands (both coastal and inland). Habitat also includes salt fields, sewage ponds, estuaries and coastal waters (Pizzey and Knight 2012).

Behaviour and Ecology

White-winged Black Terns are gregarious, normally foraging and roosting in small flocks or open flocks with other terns, especially Whiskered Terns (*Chlidonias hybrida*) (Higgins and Davies 1996). However, in areas where they are irregularly recorded, they are often seen singly, or in twos or threes.

In Australia, they often gather in large flocks at staging sites before northern migration in April–May, such as at Alva Beach, Queensland, and at North Perron Island, Northern Territory.

The White-winged Black Tern is an opportunistic forager, feeding mainly on aquatic insects (especially *Diptera, Odonata* and *Coleoptera*), and less often on terrestrial insects, spiders, small fish, tadpoles, frogs and skinks. The flocks are noisy while feeding. During coastal migration, they are often seen feeding at sea, possibly taking wind-blown insects or items from sewage outfalls (Higgins and Davies 1996).

Distribution and Abundance

Breeding is normally confined to the Northern Hemisphere, with a wide breeding range in Eurasia, from central Europe through Russia and Eastern China. The species has also bred in New Zealand (Higgins and Davies 1996).

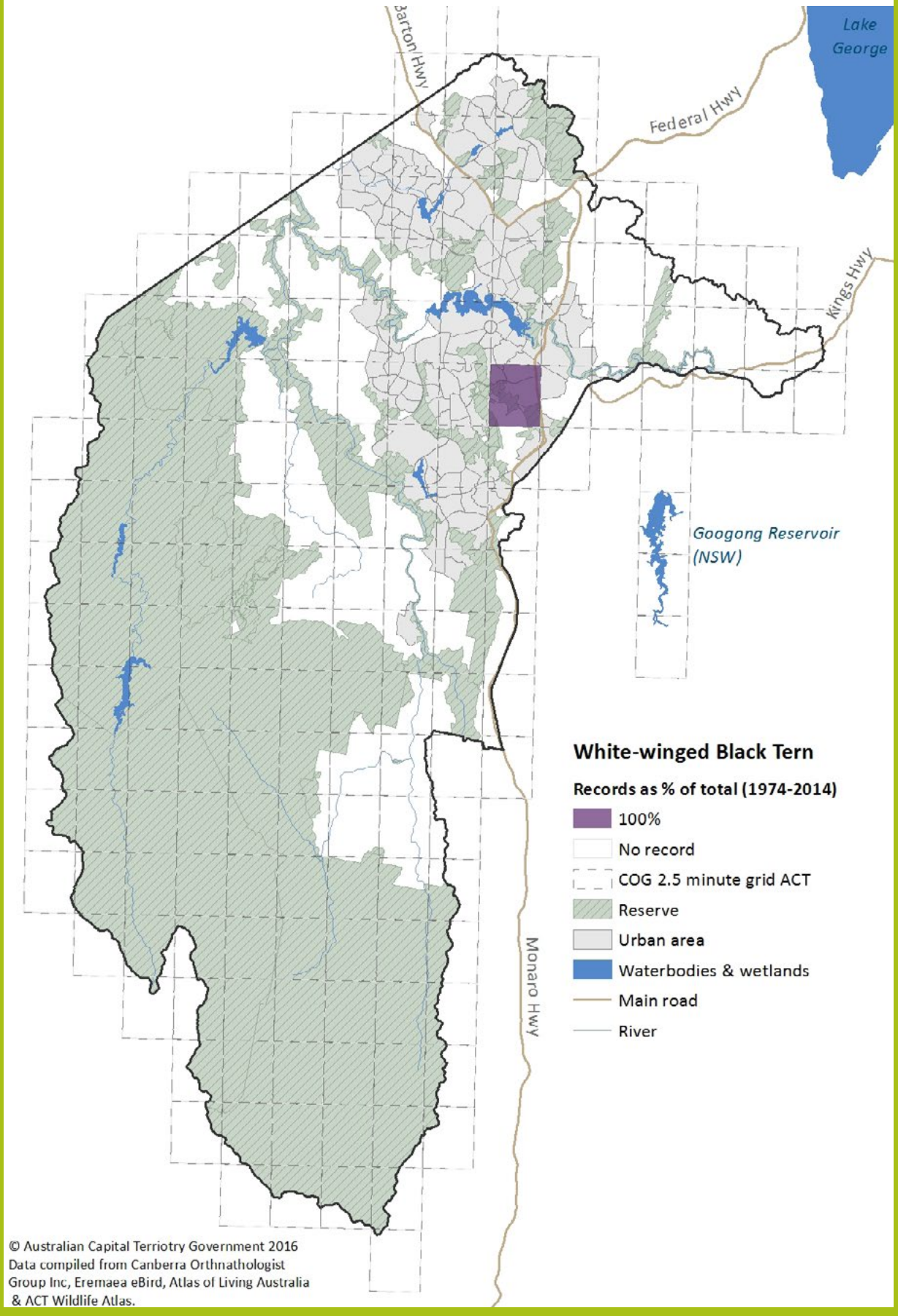
The species has a large and stable global population, estimated to be 2,500,000–4,500,000 individuals (BirdLife International 2007; Wetlands International 2006). Most of the non-breeding population migrates to Africa or Australia. In Australia, the species is widespread and common along the south-western, northern and central-eastern coasts, with only scattered records of small numbers along the coasts elsewhere in southern Australia (Barrett et al.2003; Blakers et al.1984; Higgins and Davies 1996). In Queensland, the Caloundra and Noosa sandbanks are major roosting sites for this species and other migratory and resident terns. In NSW, the species is widespread along the coast to about Wollongong, with scattered records further south.

The species occurs only rarely on inland Australian wetlands. Sites west of the Great Dividing Range, include Lake Cowal, Narran Lake and Menindee Lakes (Morris 1971).

ACT occurrence

The White-winged Black Tern is a rare vagrant in the ACT. The first record for the ACT was of one bird at both JWNR and Fyshwick Sewage Ponds on 15 October 2014 (CBN 39:3, 219; eBird 2016). A previous observation of six White-winged Black Terns at Callum Brae in 2008 (ALA 2015) was not endorsed when reported to the COG Rarities Panel because it was not accompanied by any documentation (McDonald D. 2014 *pers. comm.*). Recent sightings of the White-winged Black Tern include one to three birds seen from 25 November 2013 to 22 January 2014 in nearby NSW at Lake Bathurst East Basin (CBN 39:3,219). These sightings help substantiate the only previous historical record of the White-winged Black Tern for the ACT and region at Lake Bathurst which was mentioned in the COG Annual Bird Report for 1982–83 (CBN 9:3, 26).

Figure 23: Recorded distribution of the White-winged Black Tern (*Chlidonias leucopterus*) in the ACT



Common Tern (*Sterna hirundo*)

Location	Conservation status
International	Listed as Least Concern. (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: CAMBA, JAMBA, ROKAMBA.
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Non-breeding vagrant (eBird 2016, COG 2014b)
NSW	Not listed
VIC	Threatened. *Flora and Fauna Guarantee Act 1988*, April 2015
SA	Rare. (*National Parks and Wildlife Act 1972*, June 2011).

Features	Description
Size:	Size: 32–38 cm. Wingspan: 80 cm.
Plumage Non-breeding:	The bill is black and the legs black or orange-red. The forehead is white, with mottled dull black on the crown. The black cap on the head extends forward through the eye. At rest, a blackish shoulder bar and long, upswept blackish wingtips, equal to length of greyish forked tail is noticeable.
Breeding:	The bill is black (red in nominate race). Legs may be reddish. The head has a black cap. The upper parts are whiter that the under parts which are a washed pearl grey. The rump and tail are white with fine black outer webs to long streamed feathers.
Juvenile:	A dark shoulder bar is prominent. In flight, dark tips to the secondary feathers form grey line along the upper wing. The outer primary feathers are dark grey. The tail is pale grey with the outer edges blackish.
In flight:	In flight the birds is very buoyant, its body rising and sinking at each wing stroke as it hovers, dips, plunges. There are translucent white outer secondary feathers on the wing contrast with broad grey training edge to outer primary feathers.
Voice	The voice is an excitable, brisk ‘kik-kik-kik-kik’; a ‘keer-keer-keer-keer’; or a high pitched ‘keeee-yaah’.

Common Tern Photo: Andrew Silcocks (Birdlife Australia)

Common Tern (*Sterna hirundo*)

Habitat

Common Terns are predominantly found in marine, pelagic and coastal habitats. In Australia, they are recorded in all marine zones, and are commonly observed in near-coastal waters, on ocean beaches, platforms and headlands and in sheltered waters such as bays, harbours and estuaries with muddy, sandy or rocky shores. Occasionally they are recorded in coastal and near-coastal wetlands (either saline or freshwater), including lagoons, rivers, lakes, swamps and salt works and sewage ponds (Pizzey and Knight 2012).

Behaviour and Ecology

Common Terns are opportunistic, with a diet predominantly of small fish (greater than or equal to 15 centimetres in length), though also often taking crustaceans or insects. Common Terns forage mainly by surface or shallow plunge-diving, typically from 2–3 metres above the surface of the water. Common Terns also forage by contact-dipping and aerial dipping, taking prey from on or just below the surface.

Common Terns nest on the ground in the open, usually on bare substrates, occasionally near vegetation or in it, or on a floating mat of vegetation. Common Terns do not breed in Australia. Within its breeding range (North America, Eurasia) the species nests in the Northern Hemisphere spring–summer, from May to September. Common Terns usually breed in colonies, of a few pairs to 1800 pairs, but sometimes nest solitarily. The clutch size is one to three eggs, usually two to three, but varies between colonies (Higgins and Davies 1996).

Distribution and Abundance

The species has a large global population, estimated to be 1,100,000–4,500,000 individuals (BirdLife International 2007; Wetlands International 2006). The proportion of the global population of Common Terns in Australia is not known (Higgins and Davies 1996).

In Australia, the Common Tern occurs mainly in coastal eastern and northern Australia and is well known through past and ongoing bird atlas projects of Birds Australia and the activities of bird groups. The species is not widely 'common' in Australia, but is locally abundant at some locations in summer. The greatest concentrations occur in south-eastern Queensland (Chan and Dening 2007) and in northern Australia (Barrett et al. 2003).

At Caloundra, in south-eastern Queensland, Common Terns were the most abundant bird visiting the Caloundra sandbanks, with a count of >38,000 birds in one summer and counts of >10,000 on 25 other occasions. It is possible the Caloundra sandbanks hold the highest concentration of non-breeding Common Terns of subspecies *S. h longipennis* at any one site within Australia and one of the largest in the world (Chan and Dening 2007).

Also at Noosa, 50 kilometres north of Caloundra, counts of up to 35,000 birds (subspecies *S. h. longipennis*) but at higher densities than recorded at Caloundra. The numbers of non-breeding birds in NSW are thought to be increasing, with greater numbers in some areas where they were previously scarce or absent (Morris et al.1990).

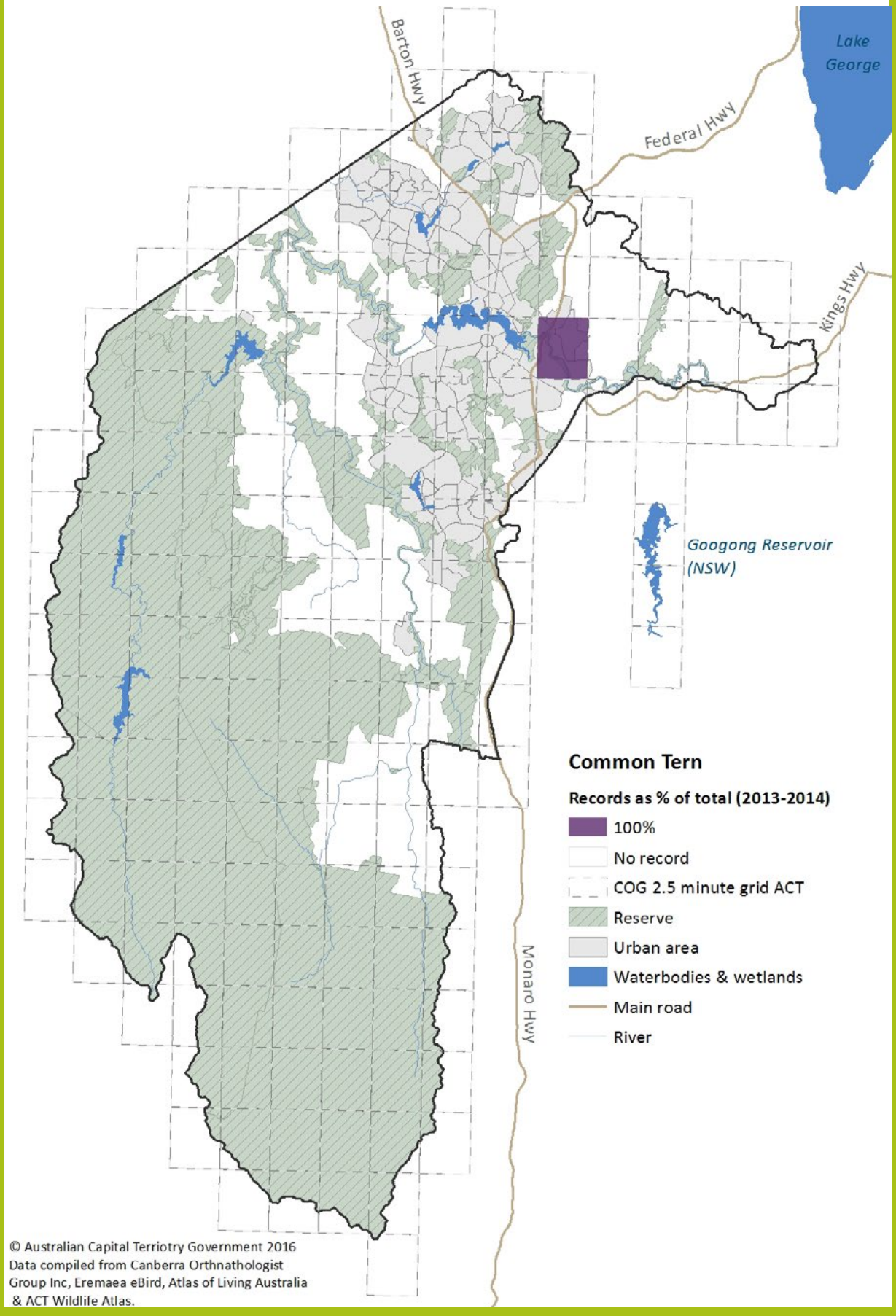
Elsewhere in Australia, large numbers are occasionally recorded at some localities, for example records of up to or exceeding 1000 birds at Nambucca Heads, Long Reef and Botany Bay, NSW (Higgins and Davies 1996).

Common Terns rarely venture inland.

ACT occurrence

This species has been reported only once in the ACT. One bird was recorded in the company of 20 Whiskered Terns on the 3 October 2013 at the Fyshwick Sewage Ponds (ACT eBird, 2016). This record has not been submitted to COG for endorsement (David McDonald *pers. comm*. 2015); therefore, the Common Tern is recognised only in COG's Supplementary List to COG's Annotated Checklist of the Birds of the Australian Capital Territory (COG 2014b).

Figure 24: Recorded distribution of the Common Tern (*Sterna hirundo*) in the ACT



8.5 FLYCATCHERS

The Flycatcher species–habitat group includes

- Rufous Fantail, *Rhipidura rufifrons*
- Satin Flycatcher, *Myiagra cyanoleuca*
- Black-faced Monarch, *Monarcha melanopsis*

These species depend on remnant forest or woodland and corridors of vegetation for their movement across more open country. Important habitat includes undergrowth of rainforest, wet and dry eucalypt forest and woodland gullies, and watercourses. They may also be seen in urban parks, gardens and farms as passage migrants.

The main threat to these three migrant flycatcher species in Australia is the clearing of old growth wet and dry eucalypt forest habitat for plantation forestry and agricultural purposes, or for urban development. The Satin Flycatcher is probably threatened to a greater degree than the two other flycatcher species because it relies more on dry sclerophyll forest habitat which is probably most affected by forest logging activities.

It has been reported that Satin Flycatchers are largely absent from re-growth forests (Loyn 1985, Smith 1984). The Rufous Fantail and Black-faced Monarch are species more reliant on moist/wet sclerophyll forest habitat which is more likely to be retained in watercourses and moist valleys after forested areas are cleared or logged.

The Rufous Fantail and Satin Flycatcher breed in the ACT in the wetter gullies of montane tall forest and woodlands. This habitat is largely protected in nature reserves and Namadgi National Park. However, all three species are affected by habitat fragmentation due the clearing of forests for forestry and agriculture, especially at lower altitudes in the ACT. Therefore, these species will benefit from restoration and establishment of habitat corridors connecting remnant forest and woodland habitat patches particularly during migration in late autumn and early spring.

Habitat may be affected by the incidence of unplanned wildfire or prescribed burning.

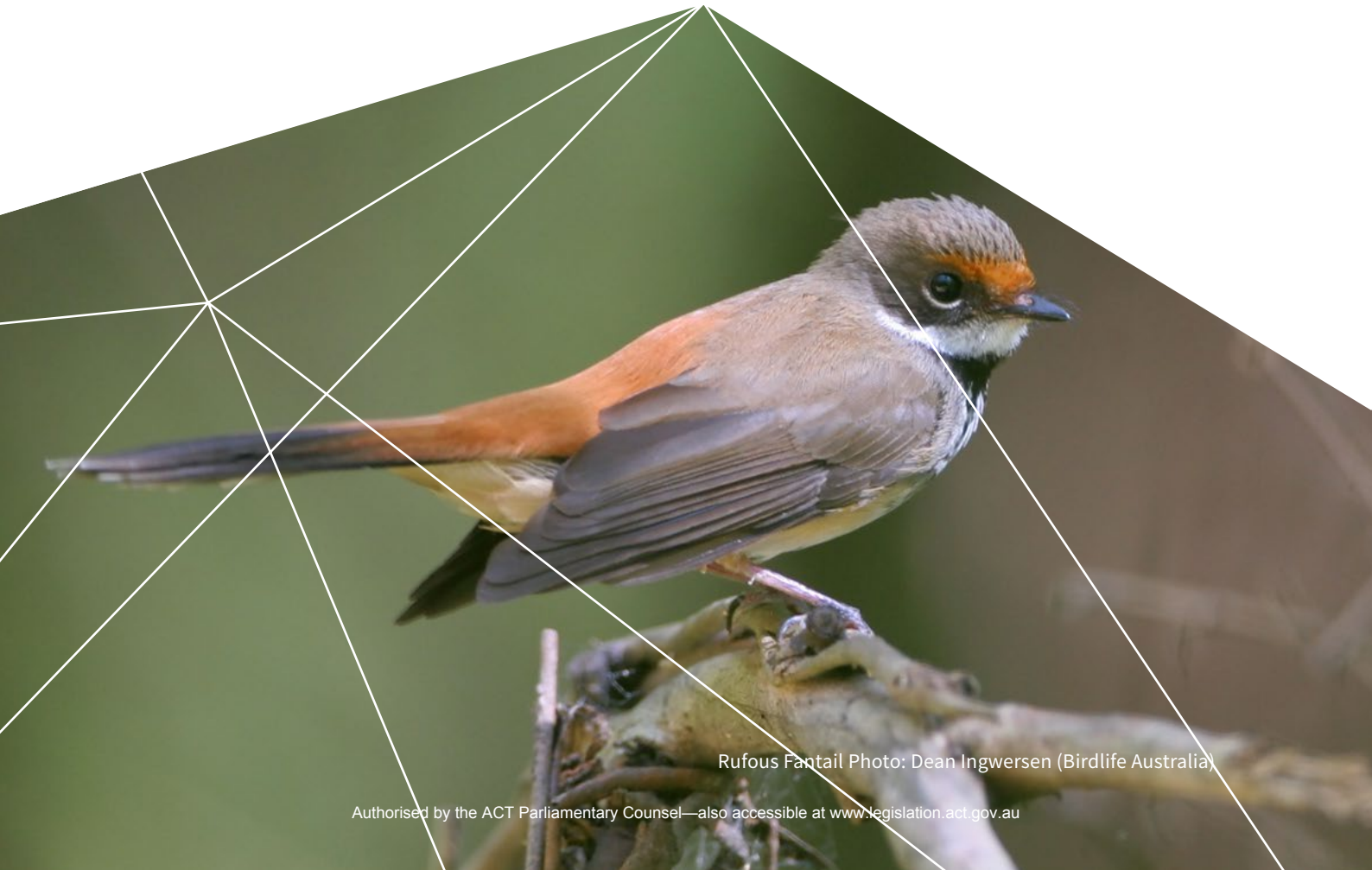
On migration, flycatchers may collide with or enter buildings.

Satin Flycatcher (male) Photo: Chris Tzaros (Birdlife Australia)

Rufous Fantail (*Rhipidura rufifrons*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn.
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Uncommon, breeding summer migrant (COG 2014).
NSW	Not listed.

	Description
Size:	15–16.5 cm.
Plumage Adults:	Birds have a fiery rufous rump and base of tail. The rest of the tail is blackish with a paler tip. The forehead and eyebrow are orange-rufous. The breast is white, crossed by a black band of blackish spots.
Juvenile:	Immature birds are duller with a rufous edge to the wing feathers.
Voice	The voice is a single high-pitched faint or penetrating squeak; accelerating into a brisk squeaky descending see-saw song. The voice is a higher pitch than the Grey Fantail.



Rufous Fantail Photo: Dean Ingwersen (Birdlife Australia)

Rufous Fantail (*Rhipidura rufifrons*)

Habitat
Habitat includes the undergrowth of rainforests and wetter eucalypt forests, including gullies. Habitat also includes monsoon forests, swamp and paperbark woodlands, sub-inland and coastal scrubs, mangroves, riparian vegetation and parks and gardens.

In eastern and south-eastern Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests, usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests; for example, near Bega in south-east NSW, where they are recorded in temperate rainforest.

They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests.

On migration, individuals are sometimes recorded in drier sclerophyll forests and woodlands, open country, farms, gardens and urban streets and buildings (Higgins et al. 2006).

Behaviour and Ecology
The species occurs as solitary birds or in pairs or small parties.

The birds chase insects with a quick and jerky flight, usually without aerobatics. Insects are also gleaned from leaves, branches, logs and the ground. The species is relatively tame, occasionally entering buildings.

Birds are less active than the Grey Fantail (*R. fuliginosa*). They forage lower in the undergrowth. The species breeds from October to February, except at altitudes above 600 metres above sea level. They breed from November to January (Frith 1969). The nest is a neat, fawn-coloured, tailed cup of bark strips, moss, grass and spiders' web. Nests are made in a shaded fork, low down or to five metres. Two to three eggs are laid. The eggs are a glossy, stone-coloured, speckled brown, lavender-grey (Pizzey and Knight 2012).

Distribution and Abundance
Birds occur in coastal northern and eastern Australia and on islands. The species is a summer breeding migrant (October to April) to south-eastern Australia, mostly in coastal areas east of the Great Dividing Range, but the range extends well inland in River Red Gum forest of the Murray Valley and Riverina.

The Rufous Fantail is virtually absent from south-east Australia in winter (Higgins et al. 2006). It is a regular autumn to winter migrant to the 'Trans-Fly' region of New Guinea and is also resident in the Solomon Islands, Micronesia.

ACT occurrence
The Rufous Fantail is amongst the last of the summer migrant bird species to arrive in the ACT and the first to depart. Individuals first appear through lowland areas and suburban gardens in mid-October, on their way to their breeding territories in the wet eucalypt forests of the nearby ranges. During the summer they are found in forest throughout the Cotter Catchment and Tidbinbilla Range, but are most common where the gullies are moist and sheltered.

The northern migration is first indicated by their appearance in the lowlands during late February. In March they pass though the city and by the end of that month they have usually left the mountain ranges altogether (Taylor and COG 1992).

The Rufous Fantail is a regular migrant to the ACT, recorded in 97% of the last 40 years (Australian Wildlife Services 2016 unpubl.).

The recorded distribution of the Rufous Fantail in the ACT strongly reflects its preferred primary breeding habitat throughout the Lower Cotter Catchment and the Tidbinbilla Range, together with records in suburban Canberra in spring and autumn as passage migrants.

There have been breeding records for this species in only eight of the 31 years for the ACT and region (CBN: 40;1, 76), although the species in known to have bred successfully in the rainforest gully at the Australian National Botanical Gardens, Black Mountain (Taylor and COG 1992).

All breeding records, with the exception of the Australian National Botanical Gardens, are confined to the Cotter Catchment and the Tidbinbilla Range in moist and sheltered gullies, habitats which most closely resemble its preferred habitat in other parts of its range.

Breeding sites have been recorded in Namadgi National Park at Lees Creek, Blundells Creek and Kangaroo Creek. Breeding has also been recorded at the Australian National Botanical Gardens, Tidbinbilla, including the Sanctuary, and at Mountain Creek and Oakey Creek.

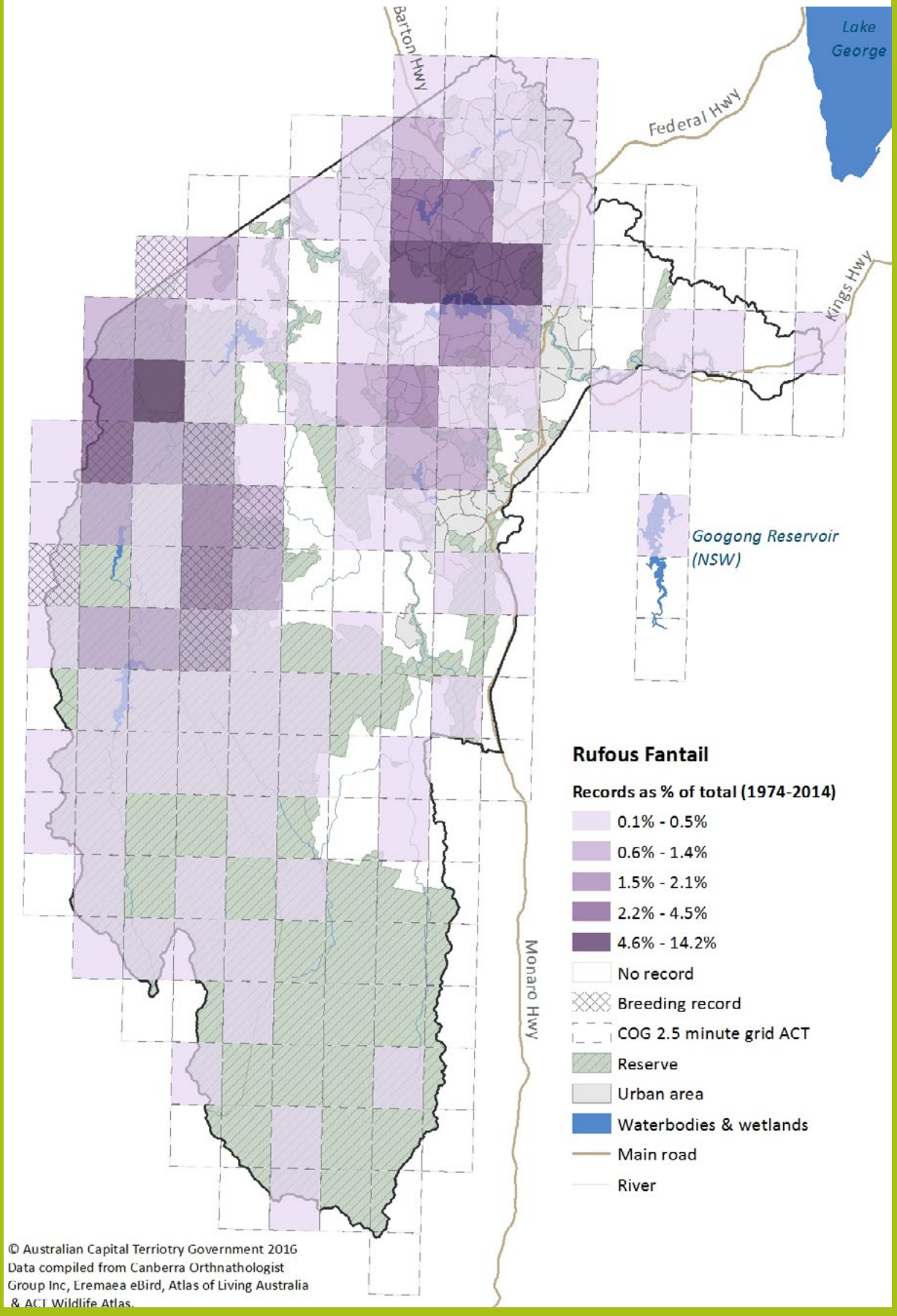
Other key sites that have recorded the species include Inner North Canberra nature reserves (Aranda Bushland NR, Mount Ainslie NR, Black Mountain NR, Cooleman Ridge NR and Gossan Hill NR) and the suburbs of Ainslie, Cook, Aranda, Weetangera and Kambah. These latter locations are the more densely vegetated nature reserves and suburbs in inner Canberra, sites most probably favoured by the Rufous Fantail while on migration through the Canberra suburban area to and from its preferred breeding sites in the Upper Cotter and the Tidbinbilla Range.

Specific Threats

The main threat to populations of Rufous Fantail is probably fragmentation and loss of core moist forest breeding habitat through forest operations, land clearing and urbanisation. The loss of forest remnants and corridors along the species' migration routes is also of concern (Huggett 2000).

For example, in Lower Bucca State Forest in north-east NSW, birds forage more in retained forest rather than in clear-felled areas. After logging, birds tend to forage more in the lower canopy and less in woody piles and dense shrub regrowth (Huggett 2000). In a further example, in Mountain Ash forests in central Victoria, birds have been first recorded in logged areas four years after logging (Loyn 1985).

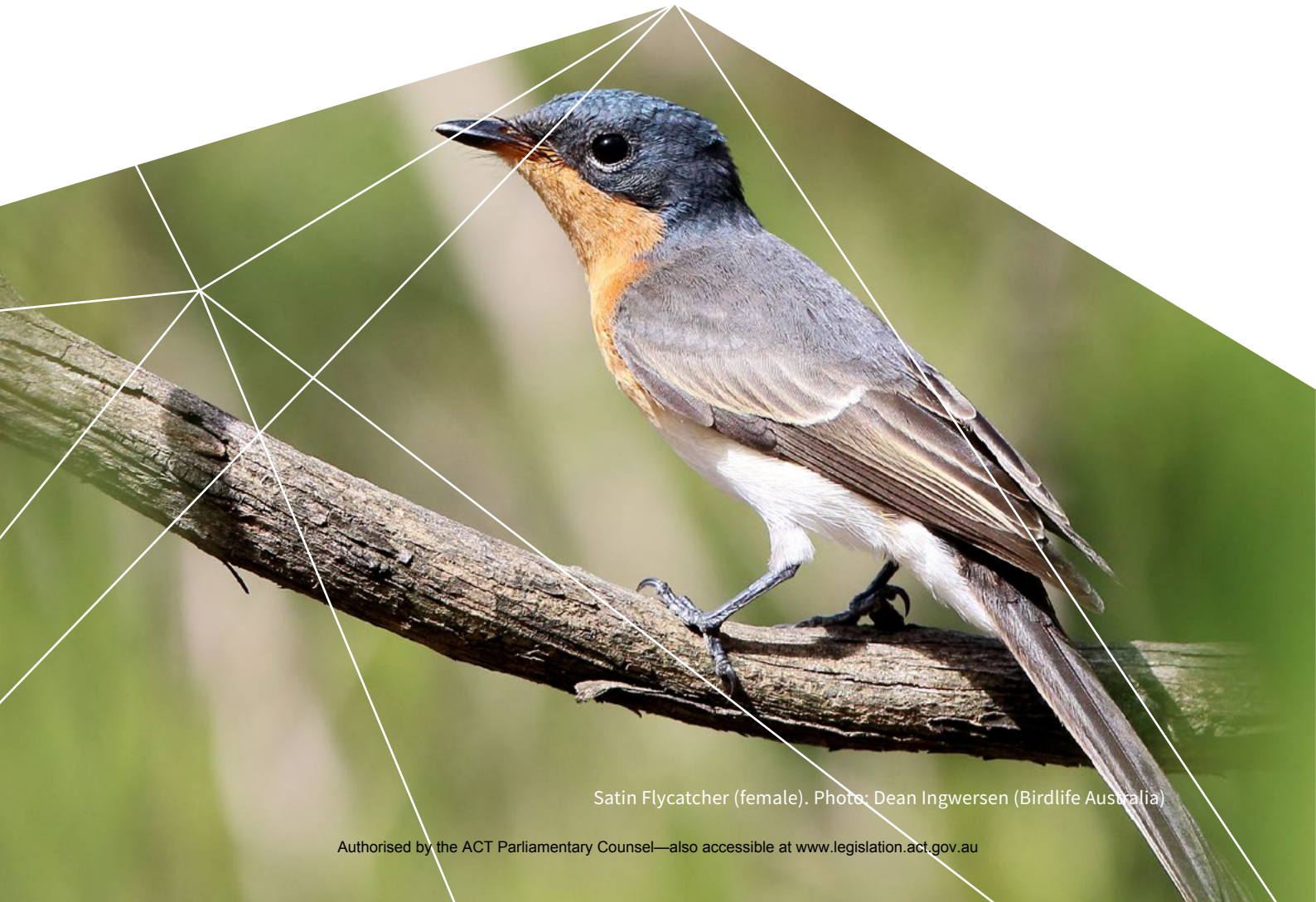
Figure 25: Recorded distribution of the Rufous Fantail (*Rhipidura rufifrons*) in the ACT



Satin Flycatcher (*Myiagra cyanoleuca*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn.
	Non–statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Uncommon, breeding summer migrant (COG 2014).
NSW	Not listed.
SA	Endangered. (*National Parks and Wildlife Act 1972* (June 2011).

Features	Description
Size:	15–17 cm.
Plumage Male:	Male birds are a uniform glossy blue-black which is cut-off sharply across the breast by white under parts.
Female:	Female birds are a slightly glossy dusky blue-grey above with a bluish sheen on crown. The throat and upper breast are a rich orange-buff. The underparts are white.
Juvenile:	Immature birds are like the female but have a buff edge to the wing feathers.
Voice	The voice is more strident than the Leaden Flycatcher (M. rubecula). It includes a guttural 'zhurp' or 'bzzurt' often repeated. It also includes a strident, clear, carrying 'wu-chee-wu-chee-wu-chee' or 'chellee chellee chellee', a clear, high-pitched 'weir to weir to-weir', or a liquid 'thurp pew-it pew-it'.



Satin Flycatcher (female). Photo: Dean Ingwersen (Birdlife Australia)

Satin Flycatcher (*Myiagra cyanoleuca*)

Habitat
Habitat includes heavily vegetated gullies in forests and taller woodlands, usually above the shrub-layer. During the migration the bird inhabits coastal forests, woodlands, mangroves, trees in open country and gardens.

Behaviour and Ecology
The species occurs as single birds or in pairs. Birds are active and readily observable darting about the branches of trees and chasing flying insects.

The species breeds in Australian from October to February and may form loose nesting colonies. Satin Flycatchers show some breeding site fidelity and are said to return to the same area each year.

The nest is a neat cup of bark strips, moss and spiders' web set on a horizontal dead branch some 5–25 metres above the ground under the cover of live foliage. Two to three eggs are laid.

Distribution and Abundance
The species occurs in eastern Australia and islands from Cape York, in Queensland to Tasmania. Occurrence is sparsely scattered in inland Australia. It is vagrant in New Zealand.

It breeds mostly in south-eastern Australia/Tasmania.

The species' arrival in Australia is strongly synchronous in October, with most appearing more or less simultaneously (Taylor and COG 1992). Birds depart south-eastern Australia in February–April and winter in north-east Queensland and New Guinea, migrating through the Torres Strait islands.

ACT occurrence
The Satin Flycatcher is a regular migrant to the ACT, having being recorded here in 97% of years. The species breeds in the ACT and breeding has been recorded in more than 50% of years (17 of the 32 years analysed) (COG 2015b).

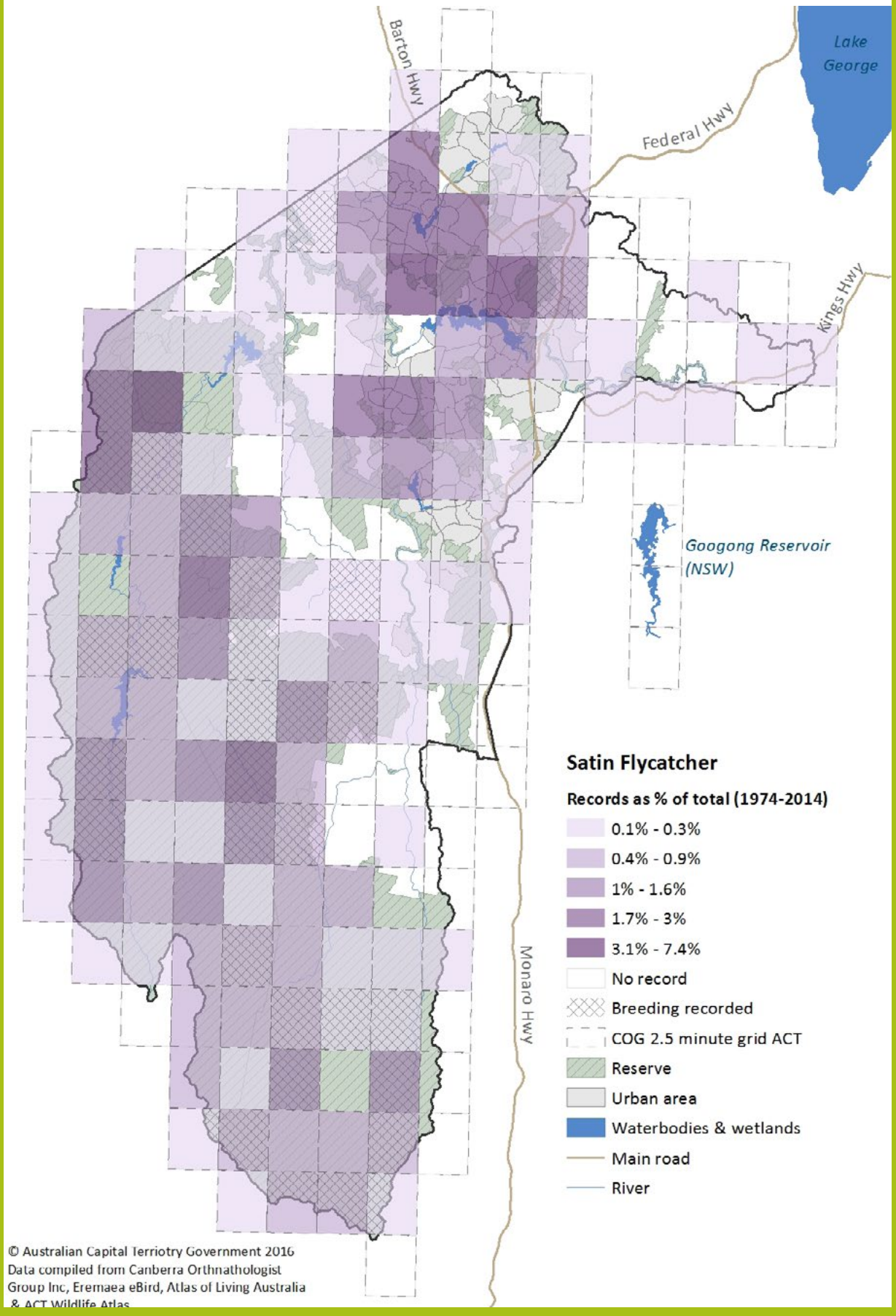
Satin Flycatchers may be found at any higher altitude within treed habitat. The highest density of distribution in the ACT is in its preferred breeding habitat, the tall-wet forest in the south-west of the ACT above 800 metres, where they are common and widespread during the summer, particularly in the Upper Cotter and Upper Naas areas, the Lower Cotter catchment and in the Tidbinbilla Range.

Other records of occurrence within Namadgi National Park are from Lees Creek, Bimberi Wilderness Area, Blundells Creek, Kangaroo Creek and Corin Dam. Most breeding records are from the moister, taller forests of the Lower and Upper Cotter Catchment areas, the Tidbinbilla Range and the Lower and Upper Naas areas.

The species is present in urban Canberra during the migration in spring and autumn, where they may be seen in a variety of lowland habitats including suburban parks, gardens and woodland. Records within the urban area are from the more densely forested nature reserves of Mount Ainslie NR, Cooleman Ridge NR, Aranda Bushland NR, Tidbinbilla NR, O'Connor Ridge NR and Gossan Hill NR. The species has been recorded in the suburban area at Ainslie, Aranda, Weetangera, Kambah, Hall and Melba.

Specific Threats
Populations of the Satin Flycatcher have been impacted by the loss of mature forests in south-eastern Australia through clearing and logging (Blakers et al. 1984); Satin Flycatchers are largely absent from regrowth forests (Loyn 1985; Smith 1984).

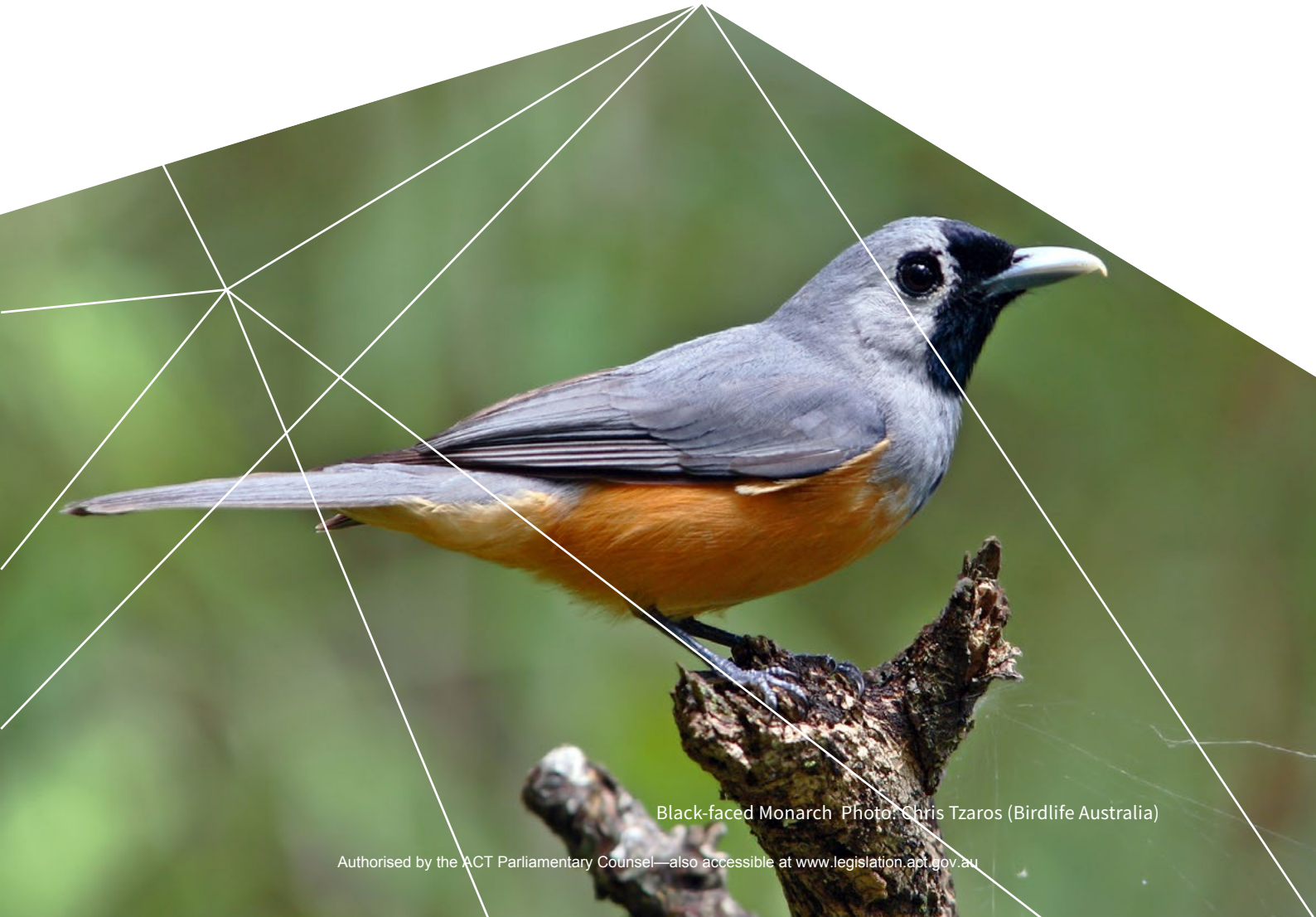
Figure 26: Recorded distribution of the Satin Flycatcher (*Myiagra cyanolueca*) in the ACT



Black-faced Monarch (*Monarcha melanopsis*)

Location	Conservation status
International	Listed as Least Concern (IUCN Red List of Threatened Species 2015).
National	Listed marine. Listed migratory: Bonn.
	Non-statutory: Least Concern. Action Plan for Australian Birds 2010 (Garnett et al. 2011).
ACT	Non-breeding summer migrant (COG 2014).
NSW	Not listed.

Features	Description
Size:	16–19 cm.
Plumage Adults:	Adult birds have a pale grey bill surrounded by distinctive black forehead and throat patch. The upper parts are grey; the upper breast contrasts with rich rufous under parts. The tail is dark.
Juvenile:	The bill of immature birds is blackish. The head is wholly grey.
Voice	The voice is a fussy, wheezy chattering with deep scolds. The main call is a rich, clear 'Why-you, which-you' with a harsher 'which-a-where' and a repeated clear, mellow, drawn out 'wheech-you' and a down-slurred 'r, rr, rerr' or 'shsh shsh-shirr'.



Black-faced Monarch Photo: Chris Tzaros (Birdlife Australia)

Black-faced Monarch (*Monarcha melanopsis*)

Habitat

Habitat includes rainforests, eucalypt woodlands and forest, and coastal scrubs. When migrating, the birds occur in more open woodland.

Behaviour and Ecology

The species occurs as single birds or in pairs.

The bird's movements are deliberate; it forages in foliage high and low in the trees and it sallies after flying insects and arthropods in the foliage.

The species breeds from October to January. The nest is a deep cup of bark strips, rootlets, green moss and spiders' web located in the fork of a slender sapling from 1 to 12 metres high.

Two to three eggs are laid (Pizzey and Knight 2012).

Distribution and Abundance

The species spends spring, summer and autumn in eastern Australia and winters in southern and eastern Papua New Guinea from March to August (Blakers et al. 1984) after migrating through the Torres Strait.

The species occurs in coastal areas of eastern Australia and on islands from Cape York in Queensland to eastern Victoria. Some birds are resident in northeast Queensland. It is a summer breeding migrant to south-eastern Australia from approximately August to April.

It is rare elsewhere. Black-faced Monarchs are rarely recorded west of the Great Dividing Range, except at Tallaganda State Forest in NSW, east of the ACT. Black-faced Monarchs are common breeding summer migrants in the tall rainforests and eucalypt forests of the coastal escarpment east of the ACT in NSW, but they are only rarely recorded west of the Great Dividing Range, except at Tallaganda Forest in NSW.

There is evidence that the Black-faced Monarch is altering its migration timing in response to climate change (Beaumont et al.2006).

ACT occurrence

In the ACT, migrating Monarchs sometimes appear in suburban Canberra in spring, and immature birds are occasionally recorded in autumn.

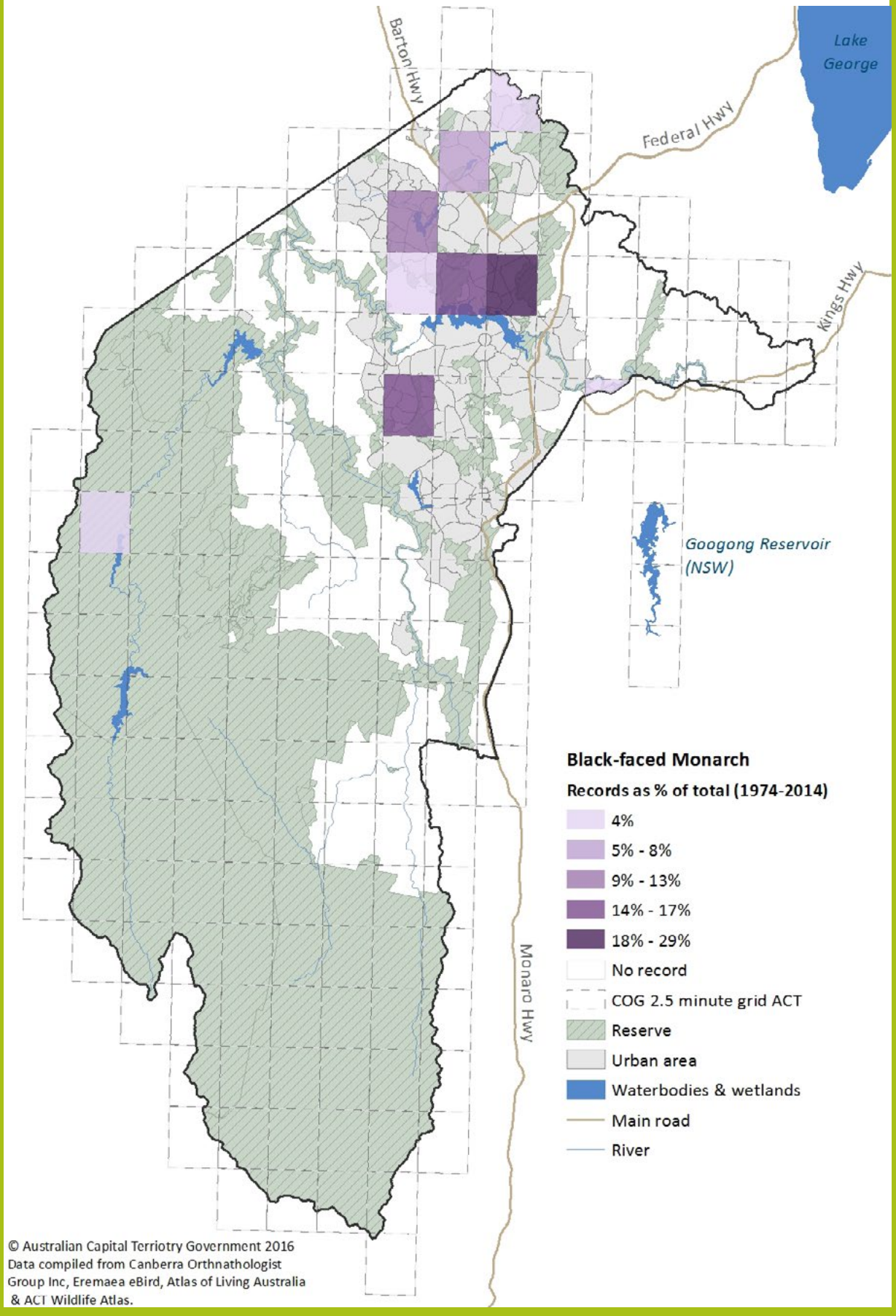
The first record of this species in the ACT is held as a specimen in the Australian National Wildlife Collection labelled: 'juvenile found dead outside a window of a house in Curtin on 28 March 1967' (Hermes 1984). Despite this record, breeding has not yet been recorded in the ACT, although potentially suitable breeding habitat apparently exists in the Lower Cotter Catchment and on the eastern slopes of the Tidbinbilla Range (Taylor and COG 1992, CBN 39:1, 73).

Since 1989–90 there have been 31 records of this species in the ACT and region, with about half these records being spring and autumn records of birds passing through the ACT; the remainder are records from east of the ACT in NSW at Tallaganda Forest or the Bendoura Range (CBN 39:1, 73; eBird 2016). As passage migrants, records are thinly spread throughout suburban Canberra apparently favouring older inner suburbs probably with established dense vegetation (e.g. Ainslie, 5 records; Curtin, 3 records; Page and Reid, 2 records each). There are three records from the Australian National Botanical Gardens in Acton, where the birds were probably attracted by the rainforest gully vegetation.

Specific Threats

Presumed threats to the species include clearing of habitat through forestry and predation by introduced predators such as cats and foxes). Individuals are known occasionally collide with windows (Taplin 1991). .

Figure 27: Recorded distribution of the Black-faced Monarch (*Monarchus melanopsis*) in the ACT



9 APPENDIX 2 — LATHAM'S SNIPE SURVEY RESULTS 2016–17

The 2016–17 Latham's Snipe survey covered 48 wetland sites in the ACT, 30 of which were surveyed on eight designated weekends between August 2016 and March 2017, the remaining 18 sites being incidental records surveyed at other times.

Of the 30 sites, there were 14 sites where snipe were recorded on the designated weekends. Of these there were 11 sites where snipe were observed on four or more weekends.

An environmental assessment is required for sites that report numbers of Latham's Snipe in excess of 18 birds. Three sites surveyed may be nationally important based on the survey results. These are Jerrabomberra Wetlands (96), Horse Park Drive Wetland (64) and West Belconnen Pond (49).

Based on the survey results the remaining 11 sites in decreasing order of importance based on total numbers of snipe recorded were: Mulligans Flat Big Dam (21), Ginninderra Creek (5), Horse Park Wetland(5), Mulligans Small Dam (4), Giralang Ponds (2), Fyshwick Sewage Ponds (2), McKellar Pond (2), *584 Norton Road (2), *Wamboin (2), *Farm Dam, Lakes Road (2), Maza Pond, Bonner (1) and Valley Avenue, Crace (1) **see Table 11**.

Of the ACT sites surveyed, two sites are probably more important as Latham Snipe habitat than the above survey results indicate. Mulligans Flat Small Dam was only surveyed four times and Fyshwick Sewage Ponds and the Canturf flood channels (which are part of the waterbody complex centred on Jerrabomberra Wetland) are known to provide important habitat, particularly at night. Of the incidental records recorded at another 18 sites outside the designated survey period, the most number of birds recorded at an ACT site was 17 birds at Jerrabomberra Creek (Davey and Gould 2017–18).

Table 11: The number of surveys and the total number of Latham's Snipe recorded during the designated survey periods at 30 wetland sites within the ACT and local region (after Davey and Gould 2017–18).

Site Name	No. Surveys	Total no. Birds
West Belconnen Pond	8	49
Fassifern	8	0
Jaramlee	8	0
Ginninderra Ck	8	5
Giralang Ponds	8	2
Horse Park Drive Wetland	8	64
Jerrabomberra Wetlands	8	96
Fyshwick Sewage Ponds	8	2
Isabella Pond	8	0
Warinna Inlet, LBG	8	0
Aranda Snow Gum	7	0
Maza Pond, Bonner	7	1
Stranger Pond	7	0
Chapman	6	0
Valley Avenue, Crace	6	1
Gungahlin Pond	6	0
Lake Ginninderra	6	0
Yarramundi Reach, LBG	6	0
Horse Park Wetland	5	5
Norgrove Park	5	0
McKellar Pond	4	2
Mulligans Flat Big Dam/Small Dam	4	21
Uriarra Dam	3	0
*584 Norton Road, Wamboin	3	2
Lake Tuggeranong	2	0
Crace Wetland	2	0
*Farm Dam, Lakes Road	2	2
*Weeroona Drive, Wamboin	2	0
Mulligans Flat Small Dam	1	4
*Wamboin (David Cook)	1	0

*Survey site located in NSW, not the ACT.