Commonwealth of Australia

Environment Protection and Biodiversity Conservation Act 1999

Subsection 269A(3)

Environment Protection and Biodiversity Conservation (Recovery Plan—Rostratula australis) Instrument 2023

We, Tanya Plibersek, Minister for the Environment and Water (Commonwealth); Eva Lawler, Minister for the Environment (Northern Territory); Lily D'Ambrosio, Minister for Energy, Environment and Climate Change (State of Victoria); Reece Whitby, Minister for Environment (State of Western Australia); Meaghan Scanlon, Minister for the Environment and the Great Barrier Reef (State of Queensland) under section 269A(3) of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth), jointly make a recovery plan titled:

> National Recovery Plan for the Australian Painted Snipe (*Rostratula australis*) Commonwealth of Australia 2022

The recovery plan will come into force on the day after the plan is registered on the Federal Register of Legislation.

Dated this 4th day of February 2023

Tanya Plibersek

Tanya Plibersek

Minister for the Environment and Water (Commonwealth)

Dated this 14th day of April 2021

Eva Lawler

Eva Lawler

Minister for the Environment (Northern Territory)

Dated this 31st day of December 2021

Lily D'Ambrosio

Lily D'Ambrosio

Minister for Energy, Environment and Climate Change (Victoria)

Dated this 13th day of June 2022

Meaghan Scanlon

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Minister for the Environment and Great Barrier Reef (Queensland)

Dated this 8 day of March 2022

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Australian Government

National Recovery Plan for the Australian Painted Snipe

Rostratula australis

Department of Biodiversity, Conservation and Attractions

Government of Western Australia

Queensland Government

VICTORIA State Government | Environment, Land, Water and Planning

Northern Territory Government

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The Species Profile and Threats Database pages linked to this recovery plan is obtainable from: www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

Images credit
Cover page: Two Australian Painted Snipe (*Rostratula australis*) feeding on Hope Island, Queensland © Graeme Chapman.

Page iv: Adult female Australian Painted Snipe concealed in a rice crop © Matthew Herring.

Page 3: Australian Painted Snipe in mud © Danny Rogers.

Page 13: Monitoring wetlands and waterbirds, including Australian Painted Snipe, is an important activity to support recovery © Department of Agriculture, Water and the Environment.

Page 21: Australian Painted Snipe hiding in mud © Danny Rogers.

Contents

Summary

Australian Painted Snipe (*Rostratula australis*)

Family: Rostratulidae

Current status of taxon:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth): Endangered
- *Nature Conservation Act 1992* (Qld): Endangered
- *Biodiversity Conservation Act 2016* (NSW): Endangered
- *Nature Conservation Act 2014* (ACT): Endangered
- *Flora and Fauna Guarantee Act 1988* (Vic): Critically Endangered
- *National Parks and Wildlife Act 1972* (SA): Vulnerable
- *Biodiversity Conservation Act 2016* (WA): Endangered
- *Territory Parks and Wildlife Conservation Act 1976* (NT): Endangered
- IUCN Red List of Threatened Species: Endangered

Distribution and habitat:

The Australian Painted Snipe has a historical distribution through most of Australia including some desert regions, but the Murray–Darling Basin, particularly the Riverina region of Victoria and New South Wales, appears to have been a stronghold for the species (Blakers et al. 1984). Smaller historical and/or present concentrations include the Channel Country in Queensland and South Australia, the Capricornia coast of central Queensland, and south-eastern South Australia (along with adjacent parts of Victoria) and increased observer effort has yielded an increase in records from Australia's savannah regions in recent decades (Leach et al. 1987; Lane and Rogers 2000; Rogers et al. 2005). Breeding records exist, many from the last two decades, across the range of occurrence including some from wetlands far beyond the Murray–Darling Basin (many records in coastal Queensland; some from the Lake Eyre Basin, Barkly Tableland and north-western Australia). The Australian Painted Snipe has also been recorded once in Tasmania (single specimen) and once in New Zealand (one confirmed and one possible record) (Marchant and Higgins 1993).

Due to the highly secretive behaviour and concealing habitats commonly used, the specific habitat requirements of the Australian Painted Snipe are much less well known than for most other Australian waterbirds. The species typically inhabits shallow freshwater and brackish wetlands, especially where inundation is temporary but also permanent wetlands with shallow zones. Swamps and claypans are favoured wetland types but inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains also may be used. In the inland and north, gilgai wetland surfaces are favoured, especially for nest sites. Dominant vegetation in occupied wetlands may include one of more of these elements: grass (e.g. canegrass *Eragrostis australasica*), sedge, and nardoo (*Marsilea*), in sward or tussock form; clumps of rushes or reeds; samphire dwarf shrubland; and open-shrubland of lignum (*Duma florulenta*), river cooba (belalie) *Acacia stenophylla*. As a secretive species, Australian Painted Snipe sometimes utilises concealing features such as fallen or washed-up timber (Marchant and Higgins 1993).

Recovery plan vision, objective, and strategies:

Long-term vision

The Australian Painted Snipe population has increased in size to such an extent that the species no longer qualifies for listing as threatened under any of the *Environment Protection and Biodiversity Conservation Act 1999* listing criteria.

Recovery plan objective:

By 2032, sustain a positive population trend (compared to 2020 baseline counts) in the number of mature individuals of the Australian Painted Snipe. This will be achieved by implementing the actions set out in this Recovery Plan that minimise threats while protecting the species' habitat throughout its range, generating new knowledge to guide recovery and increasing public awareness.

Strategies to achieve objectives

1. Manage and protect known Australian Painted Snipe habitat at the landscape scale
2. Develop and apply techniques to measure changes in population trajectory in order to measure the success of recovery actions
3. Reduce, or eliminate threats at breeding and non-breeding habitats
4. Undertake research to improve knowledge of the habitat requirements, biology and behaviour of Australian Painted Snipe
5. Engage community stakeholders to improve awareness of the conservation of Australian Painted Snipe
6. Coordinate, review and report on recovery progress

Criteria for success:

This Recovery Plan will be deemed successful if, by 2032, all of the following have been achieved:

- The Australian Painted Snipe population has increased from 2020 baseline counts, as a result of recovery actions.
- Understanding of the species' ecology has increased, in particular knowledge of breeding biology, movement patterns, habitat use and post-breeding dispersal and new information has been used toinform management interventions.
- There is increased participation by key stakeholders and the public in recovery efforts and monitoring.

Recovery team:

Recovery teams provide advice and assist in coordinating actions described in recovery plans. They include representatives from organisations with a direct interest in the recovery of the species, including those involved in funding and those participating in actions that support the recovery of the species. The national Australian Painted Snipe Recovery Team has the responsibility of providing advice, coordinating and directing the implementation of the recovery actions outlined in this recovery plan. The membership of the national Recovery Team includes individuals from relevant government agencies, non-government organisations and expertise from independent researchers and community groups.

Chapter 1

Introduction

This document constitutes the *National Recovery Plan for the Australian Painted Snipe*. The plan considers the conservation requirements of the species across its range and identifies the actions to be taken to ensure the species' long-term viability in the wild, and the parties that will undertake those actions. This Recovery Plan is the first national plan to be developed for the Australian Painted Snipe.

The Australian Painted Snipe was listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) in May 2013. At the time of listing the species met the criteria for listing as Endangered as it was inferred to have undergone a severe decline in the number of mature individuals in excess of 50 per cent over three generations (~26 years) associated with wetland loss and degradation (Garnett et al. 2011). Population estimates for Australian Painted Snipe have varied between 1,500 and 5,000 up to 2010 (Watkins 1993; Garnett and Crowley 2000). In 2020, the population was estimated to be 340 (range 270–410) mature individuals following declines in the last five years (2015–2020), although with very low certainty given the biology of the species (Rogers et al. 2021). There has been no change in the population trajectory since 2011 and the species continues to meet the Endangered category (Rogers et al. 2021).

Accompanying Species Profile and Threats Database (SPRAT) pages provide additional background information on the biology, population status and threats to the Australian Painted Snipe. SPRAT pages are available from: http://www.environment.gov.au/cgibin/sprat/public/sprat.pl.

1.1 Conservation Status

The Australian Painted Snipe is listed as threatened under the EPBC Act, and in all parts of its range under State legislation (Table 1). This species is classified as Endangered under the EPBC Act owing to recent declines over much of its breeding range. Loss and degradation of wetlands, through drainage and the diversion of water for agriculture and reservoirs, are thought to have contributed most to this decline. Over-grazing, drought and reduced rainfall are also contributing factors that have adversely affected the species across its range.

TABLE 1 National and state conservation status of the Australian Painted Snipe

Legislation	Conservation Status
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth)	Endangered
Nature Conservation Act 1992 (Queensland)	Endangered
Biodiversity Conservation Act 2016 (New South Wales)	Endangered
Nature Conservation Act 2014 (Australian Capital Territory)	Endangered
Flora and Fauna Guarantee Act 1988 (Victoria)	Critically Endangered
National Parks and Wildlife Act 1972 (South Australia)	Vulnerable
Biodiversity Conservation Act 2016 (Western Australia)	Endangered
Territory Parks and Wildlife Conservation Act 1976 (Northern Territory)	Endangered

1.2 Taxonomy

Until recently, the Australian Painted Snipe was considered to be a subspecies of the Greater Painted Snipe (*Rostratula benghalensis*), a species that occurs across Africa and Asia (Marchant and Higgins 1993). However, Lane and Rogers (2000) recommended treating the subspecies found in Australia (*R. benghalensis australis*) as a full species (*R. australis*) based on its distinctive appearance, measurements and anatomy. Genetic studies indicate that the Australian Painted Snipe is a distinct species that diverged around 19 million years ago. It is now accepted as a full species (Baker et al. 2007; Garnett et al. 2011; ADF 2019). The Australian Painted Snipe is the only member of the genus *Rostratula* that occurs in Australia (del Hoyo et al. 1996; AFD 2019).

1.3 Species description

The Australian Painted Snipe is a small stocky waterbird, approximately 240–300 mm in length, with a wingspan of 500–540 mm and weighing 125–130 g (Marchant and Higgins 1993). The adult female is more colourful and larger than the male. It has a chocolate-brown head with chestnut patch in the nape, a comma-shaped white marking around the eye and metallic green back and wings, barred olive and black. A diagnostic white 'harness marking' runs from the mantle onto the breast. It has a brown eye, white belly, bluish-green legs and long pink-orange bill darkening towards the tip. The male is smaller than the female and has a duller head pattern. It has a mottled grey-brown head and neck, with a buff stripe down the centre of the crown and through the eyes. Wings and back are spotted black, buff and white, and the breast has a broad black band. There is no seasonal variation in the plumage of the Australian Painted Snipe. The juvenile plumage is very similar to the adult male (Marchant and Higgins 1993).

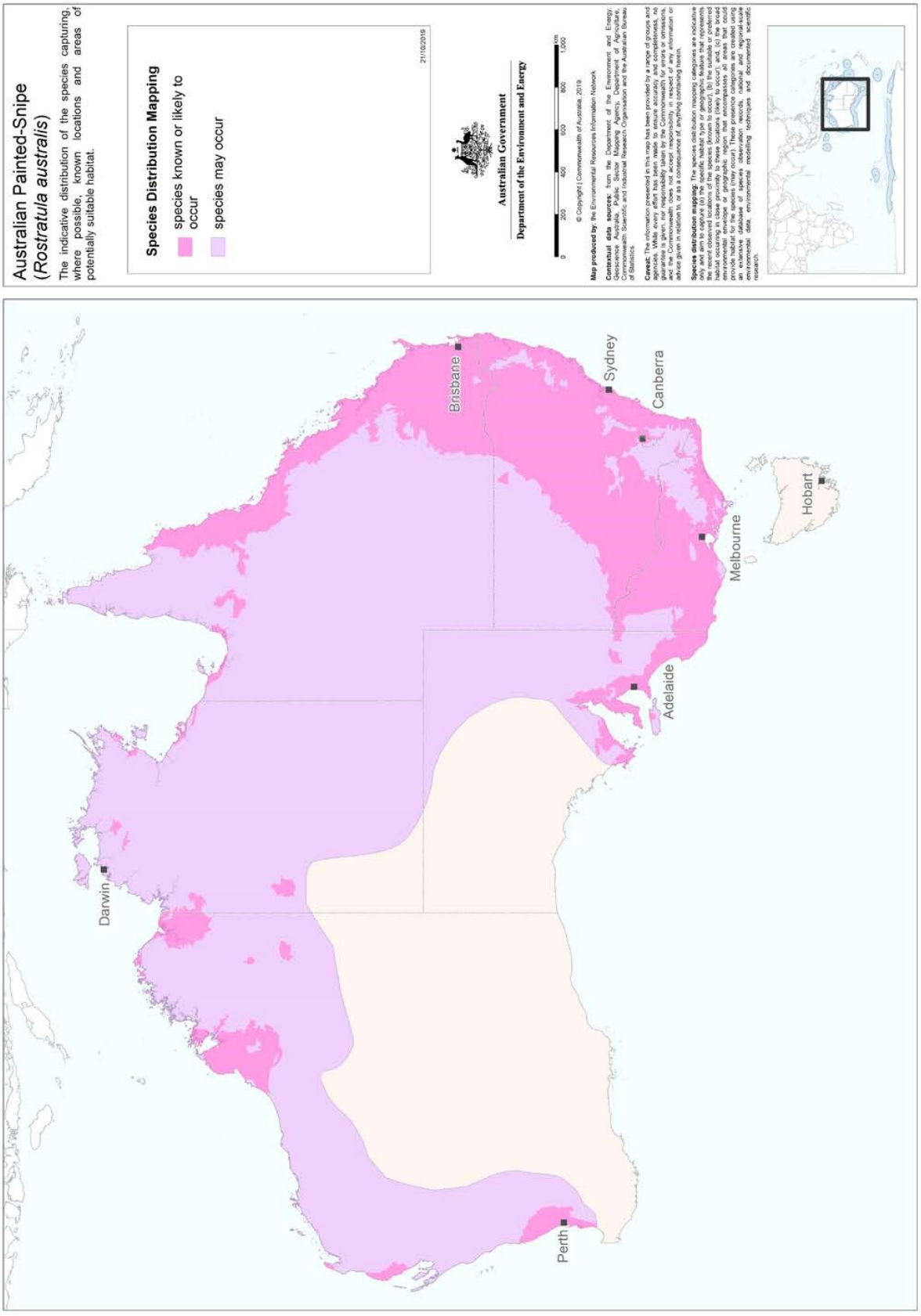
1.4 Species distribution in Australia

The Australian Painted Snipe is endemic to Australia. The species has a historical distribution through most of continent including some desert regions, but the Murray–Darling Basin, particularly the Riverina region of Victoria and New South Wales, appears to have been a stronghold for the species (Blakers et al. 1984) (Figure 1). Smaller historical and/or present concentrations include the Channel Country in Queensland and South Australia, the Capricornia coast of central Queensland, the Swan Coastal Plain and north-west of Western Australia and south-eastern South Australia (along with adjacent parts of Victoria) and increased observer effort has yielded an increase in records from Australia's savannah regions in recent decades (Knuckey et al. 2013; Leach et al. 1987; Lane and Rogers 2000; Rogers et al. 2005). Breeding records exist, many from the last two decades, across the range of occurrence including some from wetlands far beyond the Murray–Darling Basin (many records in coastal Queensland; some from the Lake Eyre Basin, Barkly Tableland and north-western Australia). The Australian Painted Snipe has also been recorded once in Tasmania (single specimen) and once in New Zealand (one confirmed and one possible record) (Marchant and Higgins 1993).

Surveys in northern and arid inland parts of Australia have shown that the Australian Painted Snipe does occur and breed there (Hassell and Rogers 2002; Jaensch 2003; Jaensch et al. 2004) and there are many records including breeding and aggregations, from coastal Queensland. It is evident that these parts of the continent have always been occupied, however infrequently, by the Australian Painted Snipe and may be more important than currently recognised because of relatively few surveys as the Murray–Darling Basin offers less reliable habitat. There is some evidence of seasonal 'migration' between south-eastern Australia and regions to the north (Black et al. 2010), which would place higher importance on conservation of inhabited wetlands in all regions of the species' range.

The patterns of present-day distribution are not fully understood and in some respects, this may be due to many of the same reasons given for unreliable population estimate data. Analysis by Rogers et al. (2005) of all (35) breeding site records since 1884 revealed that breeding had taken place in all mainland states and the Northern Territory. However, if the period from 1995–2005 is examined, then known breeding occurred only in Western Australia (one site record), Queensland (three site records), and Victoria (one site record). These examples illustrate the patchy recording of the species and consequent lack of knowledge regarding distribution and movements on a continental scale. Furthermore, large areas of inland and remote Australia are rarely if ever visited by ornithologists and even less so in wetter periods when the species is likely to be nesting (but country less accessible). Added to this is the secretive habits of the species and concealing habitat used.

FIGURE 1 Indicative distribution of the Australian Painted Snipe



1.5 Population size and trends

In 2020, the population was estimated to be 340 (range 270–410) mature individuals following declines in the last five years (2015–2020), although with very low certainty given the biology of the species (Rogers et al. 2021). Population estimates for the Australian Painted Snipe are considered to be unreliable for a number of reasons. The cryptic nature of the bird undoubtedly contributes to it being overlooked during surveys; data are sporadic and therefore biased in terms of where people are more likely to be observing (geographically across its range, as well as spatially within a flooded wetland area). Large parts of the species' range are rarely visited by professional ornithologists or citizen scientists.

Population estimates have varied from 1,500 (Watkins 1993), 5,000 (Garnett and Crowley 2000) and <2,500 (Garnett et al. 2011) but may now be down to 340 mature individuals (Rogers et al. 2021). However, care should be taken when comparing these population figures. For example, waterbird populations in Australia in the late 1970s were probably elevated due to the exceptionally wet (one in 100 years) period 1974–6 and already perhaps still boosted by the very wet 1950s (R. Jaensch pers. comm.). Cyclic fluctuations such as these wet year events are a natural phenomenon and unless taken into account - along with possible variations in distribution of waterbird populations reacting to wet and dry years - survey results and population trends can be misleading. Couple this with the difficulties associated with locating and detecting the Australian Painted Snipe, it is reasonable to assume that previous population estimates are unreliable.

Although always thought to occur in limited numbers (that is, erratically or rarely recorded and usually counted in numbers of less than ten per wetland) (Marchant and Higgins 1993), the Australian Painted Snipe has experienced a decline since European settlement. Lane and Rogers (2000) noted a substantial reduction in numbers in the Murray–Darling Basin since the 1950s. This was based on Birds Australia's Atlas of Australian Birds reporting rate changing from 0.7 per cent to around 0.08 per cent by the 1980s, despite the increase in survey effort. The decline is continuing, much more so than for other waterbird species (Lane and Rogers 2000). Data collected for the 'New Atlas' period of 1998 to 2002 demonstrates a further reduction of the Australian Painted Snipe numbers compared to those of the 'First Atlas' period of 1977–81 (Rogers et al. 2005). The pattern of decline coincides with an increase in irrigated agricultural activities (Rogers et al. 2005) which has had the dual impacts of adversely affecting habitat and denying water to remnant habitat.

1.6 Ecology

Habitat

Due to relatively scarce records and unpredictable movements, very little is known about the specific habitat requirements of the Australian Painted Snipe and requires further research. The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum (*Duma* spp.) or canegrass or sometimes tea-tree (*Melaleuca*). The Australian Painted Snipe sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (Marchant and Higgins 1993).

Australian Painted Snipe breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and mixed heights of low vegetation. Nest records are all, or nearly all, from or near small islands in freshwater wetlands, with a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover (Rogers et al. 2005). Gilgai micro relief, comprising extensive systems of small mounds (e.g. 1 to 3 m in diameter) and hollows (e.g. up to 0.5 m deep), is especially suitable; wetlands with gilgai are abundant in seasonal and other temporary wetlands of Australia, especially in the Murray–Darling, arid and savannah regions on clay soils.

The Australian Painted Snipe has also been recorded nesting in and near swamps, canegrass swamps, flooded areas including grazing land, among cumbungi, sedges, tussock grasses, various couch grasses, and samphires (*Tecticornia* spp.), also in ground cover of water-buttons and grasses, at the base of tussocks and under low saltbush (Marchant and Higgins 1993). One nest has been found in the centre of a cow-pat in a clump of long grass (Marchant and Higgins 1993) and nests with eggs have been found with cattle foot-pugs on either side (Jaensch 2003a).

The nest is usually placed in a scrape in the ground (Pringle 1987), and either has scant lining or is a shallow bowl-shaped nest of dry grass or other plant material (Marchant and Higgins 1993). The Australian Painted Snipe can use modified habitats, such as low-lying woodlands converted to grazing pasture, rice farms, sewage farms, dams, bores and irrigation schemes (Marchant and Higgins 1993), however they do not necessarily breed in such habitats.

The Australian Painted Snipe loafs on the ground under clumps of lignum, tea-tree and similar dense bushes (Marchant and Higgins 1993). This species has been recorded foraging under clumps of tea-trees (Leach et al. 1987) but most records are from daytime roost sites and the foraging habitat requirements of this species are not well understood and may be quite specific. Further research on the habitat requirements of the Australian Painted Snipe would aid future management of the species.

Breeding

The Australian Painted Snipe may breed in response to rainfall patterns and wetland conditions rather than during a particular season. It has been recorded breeding in all months in Australia. In southern Australia most records have been from August to February; this coincides with winter-spring filling and spring-summer drawdown of temporary natural wetlands under the winter rainfall regime. Eggs have been recorded from mid-August to May. Breeding in northern Queensland has been recorded between May and October (Marchant and Higgins 1993), which coincides with summer-autumn filling and winter-spring drawdown of temporary natural wetlands. In the Channel Country and Barkly Tableland, where flooding/inundation is driven by summer-autumn monsoonal and thunderstorm rainfall, active or recently active nests have been found in January, March and May, several weeks or months after a flood peak (Jaensch 2003a, 2003b, 2009).

This species has mainly been recorded breeding in the Murray–Darling region but has also been recorded in coastal central Queensland (Black et al. 2010), south-east Queensland, eastern NSW, the Channel Country, south-east South Australia and the Mt Lofty Ranges—with a few records from Australia's savannah bioregions. The most northerly breeding records include seven nests from near Derby prior to 1999 and one probable record from Taylor's Lagoon, near Broome, in 1999 (Hassell and Rogers 2002), followed by at least four confirmed breeding records on Roebuck Plains Station in 2017, and one in 2018 (N. Jackett pers. comm.), from Tarrabool Lake in the Barkly Tableland in 1993 (Jaensch 2003), and from Ayr, Queensland in the 1950s (Marchant and Higgins 1993). Though unconfirmed, there was evidence of breeding (a pair with the male consistently giving the distraction display that often indicates juveniles nearby) at an un-named wetland in the Sturt Plateau bioregion, Northern Territory, in June 2001 (Jaensch 2003b). This record was several months after exceptional rainfall across the bioregion in summer-autumn 2001.

In some situations this species is loosely colonial, although nests are widely separated (Lowe 1963). The Australian Painted Snipe has been recorded breeding near nesting Red-necked Avocets (*Recurvirostra novaehollandiae*), Pied Stilts (*Himantopus leucocephalus*), Red-kneed Dotterels (*Erythrogonys cinctus*) and Black-tailed Native-hens (*Tribonyx ventralis*) (Lowe 1963).

The Australian Painted Snipe defends a territory around its nest in the breeding season (Pringle 1987). Territory size has not been quantified, but as the species sometimes nests in loose colonies in which nests may be as little as 20 m apart (Lowe 1963; McGilp 1934), territories in that situation would appear unlikely to extend much beyond the area immediately surrounding the nest.

Australian Painted Snipe are known to lay two to six (usually three or four) eggs, and females may lay up to four clutches in a year. Incubation takes 15–21 days. Chicks are precocial (well-developed, eyes are open and are capable of moving around shortly after birth) and nidifugous (able to leave the nest shortly after hatching), but they are brooded and dependent for the first few days. The incubation of the eggs, and all care of the young, is undertaken by the male (Marchant and Higgins 1993).

The female Australian Painted Snipe mostly breed every two years (del Hoyo et al. 1996; Marchant and Higgins 1993). Based on available breeding records where success could be determined, a combined 23 eggs laid produced a total of six nestlings (Hassell and Rogers 2002; Lowe 1963; Marchant and Higgins 1993; Thomas 1975).

Feeding

The Australian Painted Snipe eats plant material, seeds, insects, worms and molluscs, crustaceans and other invertebrates (Marchant and Higgins 1993).

This species is mainly crepuscular (active at dawn and dusk), preferring to sit or stand quietly under cover of grass, reeds or other dense cover during day, becoming more active at dawn, dusk and during night. They generally remain in dense cover when feeding, although may forage over nearby mudflats and other open areas such as ploughed land or grassland (Marchant and Higgins 1993). The species may have quite specific foraging habitat requirements, but these are not well understood and further study is required.

Feeding behaviour is likely to be different in wetlands where Australian Painted Snipe are present for breeding compared to sites that may act as refuges or stop-over sites, e.g. sewage ponds, water storages. Behaviour is likely to change depending on the height and density of wetland vegetation.

Movement patterns

Movement patterns are poorly known for this species (Pringle 1987). They are possibly dispersive or migratory (Lowe 1963) but might be best described as nomadic (movements with no fixed spatial or temporal pattern). Movements have been attributed to local conditions: to flooded areas; from drying to permanent wetlands; away from areas affected by drought. Evidence for migration of some birds includes claims of regular seasonal influxes, e.g. spring-summer or summer visitor to Cunnamulla and Minden in Queensland, Mossgiel in south-western NSW, and Victoria (Marchant and Higgins 1993).

Surveys from 1977–1981 suggest that the birds leave the southern part of their range in winter, as combined reporting rates for eastern Queensland, NSW and Victoria were 0.5 per cent in summer and 0.04 per cent in winter (Blakers et al. 1984). It is not known if the difference in reporting rate is due to movement or if the species is just more difficult to find in winter. It is claimed that birds arrived at Ayr, Queensland from March to April each year (Lowe 1963). A breeding flock near Kerang remained approximately 150 days in the area from November 1956 (Lowe 1963). Records in the Kimberley region are from all months and breeding has been recorded in March, August to September and possibly December. This suggests that the population may be resident, although not strictly sedentary (Hassell and Rogers 2002).

Occurrence of major and widespread flooding in inland regions has coincided with records of Australian Painted Snipe occurrence, e.g. breeding in floodplain wetland of the Diamantina River, Queensland Channel Country, in January 2001 after a flood peak had subsided (Jaensch 2003a), following widespread major flooding in 2000; breeding at Lake Tarrabool, Barkly Tableland, before May 1993, after major flooding across the region's wetlands (Jaensch 2003b); and occurrence in northern catchment of the Georgina River, north-west Queensland, in April 2009, following a major flood (Jaensch 2009). These dates also fit the pattern suggested by Black et al. (2010).

1.7 Habitat critical to the survival of the Australian Painted Snipe

Due to relatively scarce records and unpredictable movements, very little is known about the specific habitat requirements of the Australian Painted Snipe. The habitat, or biophysical environment, of the Australian Painted Snipe varies across its range, so it is not possible to generate one detailed description or definition of habitat critical to survival. The habitat critical to the survival of the Australian Painted Snipe may be more usefully defined at a bioregional scale that takes into account the combination of plants, animals, water depth, geology, landforms, and climate that is relevant to a geographical unit. Any categorisation of habitat critical to survival must acknowledge that it exists as a mosaic of wetland habitats, with carrying capacity fluctuating with seasonal or episodic floods and effects of threats.

The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum or canegrass or sometimes tea-tree (*Melaleuca*). The Australian Painted Snipe sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (Marchant and Higgins 1993).

Australian Painted Snipe breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and mixed heights of low vegetation. Nest records are all, or nearly all, from or near small islands in freshwater wetlands, with a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover (Rogers et al. 2005). Gilgai micro relief, comprising extensive systems of small mounds (e.g. 1 to 3 m in diameter) and hollows (e.g. up to 0.5 m deep), is especially suitable; wetlands with gilgai are abundant in seasonal and other temporary wetlands of Australia, especially in the Murray–Darling, arid and savannah regions on clay soils.

As a guide, habitat critical to the survival of the Australian Painted Snipe can be considered to include:

- Any natural wetland habitat where the species is known or likely to occur (especially with suitable breeding habitat) within the indicative distribution map (Figure 1).
- Any location outside the above area that may be periodically occupied by Australian Painted Snipe when wetland conditions are favourable.

Habitat critical to the survival of the Australian Painted Snipe occurs across a wide range of land tenures, including on Indigenous Protected Areas, freehold land, state reserves, and national parks. It is essential that the locations where the species regularly occurs is given the highest protection and conservation measures target these productive habitats. Sympathetic management of buffer areas adjoining nesting and foraging habitats is also important to consider. Buffer zones will depend on the nature and location of the activity (e.g. adjacent to the wetland vs activity in the catchment area) and can be informed by expert opinion.

When considering developments in any part of the species' range, including in areas where the species 'may occur', surveys for occupancy when conditions are suitable, remain an important tool in establishing the areas importance for the Australian Painted Snipe. In addition, it is also important to note that the Australian Painted Snipe opportunistically uses areas depending on the occurrence of suitable wetland habitats and prey species. Areas that may be important habitat over time might not have birds in any given year. This pattern of habitat use means that recent survey data and historical records need to be considered when assessing the relative importance of a region for the Australian Painted Snipe.

Chapter 2

Threats

2.1 Historical causes of decline

It is thought that the Australian Painted Snipe has been in decline for some time, largely as a result of land use changes in the Murray–Darling Basin. The historical loss of temporary wetlands, through drainage and diversion for agriculture and reservoirs has caused a decrease in the population by >50 per cent over three generations (26 years). Substantial decreases in the reporting rate of the species between 1977 and 2007 coincided with major changes in water management in the Murray–Darling Basin, including diversion to irrigated agriculture (Kingsford 2000; Lane and Rogers 2000).

2.2 Current threatening processes

The main threat to the Australian Painted Snipe is the loss and degradation of wetlands, through drainage and the diversion of water for agriculture and reservoirs (Lane and Rogers 2000; Garnett et al., 2011). Rogers et al. (2005) stated that the loss of breeding habitat in the Murray–Darling Basin has occurred through: (1) the reduced frequency of flooding in previously suitable habitat, exacerbated by a loss of fresh water to irrigation and other diversions; (2) water levels being stabilised in remaining wetlands so that water becomes too deep, or continuous reed beds develop; and (3) loss of wetland vegetation in floodplain wetlands due to increased cropping, and possibly through altered fire regimes at some sites. These hydrological changes have occurred in parallel with an extended period of drought in Australia and these conditions have intensified the impacts of wetland degradation and water diversion in the Murray–Darling Basin. Under various climate change scenarios, the competition for water resources is likely to intensify, placing further pressure on Australian Painted Snipe. Inundation of floodplain wetlands in northern and other regions of Australia may be less certain as plans for expansion of irrigated agriculture are implemented.

Grazing and the associated trampling of wetland vegetation, nutrient enrichment and disturbance to substrate by livestock may threaten the Australian Painted Snipe in certain regions, particularly where grazing is concentrated around wetlands during dry seasons (Johnstone and Storr 1998; Rogers et al. 2005). However, Australian Painted Snipe has persisted and continues to breed in rangelands of Australia despite several generations of pastoral grazing so any statements of threat related to grazing must be understood in this context.

Reduced rainfall and runoff in the Murray–Darling Basin associated with climate change (Chambers et al. 2005) may threaten the Australian Painted Snipe in the future. The species is influenced by seasonal conditions and at least part of the population uses the Murray–Darling Basin for breeding; as such, these conditions could have a significant impact on the species if combined with other known and potential threats.

Predation by invasive animals (e.g. nest predation by foxes (*Vulpes vulpes*) or cats (*Felis catus*)) may be a threat to the Australian Painted Snipe, however there is no direct evidence for this. Additional potential threats include coastal port and infrastructure development at coastal drought refuges and the replacement of native wetland vegetation by invasive weeds (Rogers et al. 2005). The impacts of fire on the Australian Painted Snipe are unknown, but may influence wetland vegetation (Rogers et al. 2005).

2.2.1 Changes to water regimes and structural changes to wetlands

The most critical threat in terms of extent of impact on Australian Painted Snipe habitat has been the diversion of water for irrigated agriculture, especially in the Murray–Darling Basin. Vast floodplain systems that offered extensive habitat for the Australian Painted Snipe no longer (or only rarely) become inundated.

The Murray–Darling Basin is Australia's most developed river basin with approximately 240 dams storing 30,000 gigalitres of water (Kingsford et al. 2017). It is estimated that around 70 per cent of all water used for agriculture in Australia is used in the Murray–Darling Basin. The total area of irrigated crops and pastures is 1.8 million hectares or 1.7 per cent of the total area of the Murray–Darling Basin (Murray–Darling Basin Commission 2007). Many remaining wetlands in the Murray–Darling Basin are subject to changes, such as alteration to water regimes either in terms of volume and/or seasonal fluctuations. The conversion of wetlands into dams impacts on the nature of the wetland and its suitability for the Australian Painted Snipe. Adverse activities include:

- diversion of water away from wetlands
- stabilisation of water levels through damming or deepening wetlands
- removal of islands
- alteration to wetland edges
- flood mitigation works
- alteration to the surrounding ground levels (e.g. laser levelling for agriculture).

2.2.2 Drainage of wetlands and fragmentation of waterways

Drainage has had an impact on wetlands, with some regions being more affected than others. For instance, 89 per cent of wetlands in south-east South Australia have been lost (Environment Australia 1997). In Victoria, 37 per cent of wetlands have been lost primarily as a result of drainage. The loss of potential Australian Painted Snipe habitat in Victoria is likely to be considerably greater than these figures imply, as much of the remaining habitat has permanent or semi-permanent regimes of water management that do not provide breeding opportunities for the species.

Before drainage schemes were introduced to the south-east of South Australia, extensive temporary wetland systems would have offered much habitat for the Australian Painted Snipe each year. Deep draining (between 1949–1972) affected most of these systems but ongoing changes to regional drainage schemes pose continuing challenges to the management of remnant Australian Painted Snipe habitat.

Drainage of temporary wetlands across the landscape has also resulted in fragmentation of suitable habitat. Consequently, the Australian Painted Snipe may now have to travel larger distances between wetlands and expend more energy more often in order to obtain adequate food and shelter that is productive enough for breeding. The degradation of remaining wetlands further 'fragments' the pattern of suitable habitat.

2.2.3 Deterioration of water quality

Deterioration in water quality can alter the habitat characteristics of a wetland, including the habitat necessary for prey, as well as suitable vegetative cover and nest sites for the Australian Painted Snipe. Many wetlands used by the Australian Painted Snipe may now be degraded to varying degrees, and less productive for the species, which may necessitate more energy expenditure in foraging time and effort. This situation is likely to be detrimental to the chicks in particular. Deterioration in water quality might necessitate increased movements between foraging areas and suitable roost site vegetation if vegetation cover and habitat for prey has been altered.

Water quality can be affected directly or indirectly via lack of flushing flows, increased concentrations of pollutants in run-off, saline discharge, pesticide and herbicide run-off or spray drift; and vegetation removal leading to erosion and turbidity. Many possible impacts due to water quality are hypothetical and remain to be proven in the case of Australian Painted Snipe but can be inferred from studies of other species and/or relevant wetland types.

2.2.4 Invasive plants

Non-indigenous weeds

Changes to water regimes, water depth and surrounding land management has led to changes in terrestrial and aquatic plant species and structure associated with wetlands. These changes may advantage native and non-native plant species that are invasive and consequently negatively affect the habitat for the Australian Painted Snipe. For example, in the Murray–Darling Basin the introduced mat-forming plant Lippia (or Fog-fruit, *Phyla canescens*) has infected large areas. This plant out-competes native grasses (which are preferred livestock fodder) in areas subject to infrequent inundation and thus is favoured by the current regime of reduced frequency and duration of floodplain inundation. In response, landholders have opted to convert natural wetlands to cropland, thus ultimately removing habitat of the Australian Painted Snipe and other waterbirds.

Changes to vegetation structure by native plants

Native plants such as Common Reed (*Phragmites australis*) and Cumbungi (*Typha* spp.) may increase in cover in shallow wetlands altered by permanent or semi-permanent water regimes. These plants provide cover for secretive waterbirds and are integral habitat to many natural wetlands including many used by Australian Painted Snipe. However, if these tall plants invade and totally transform open wetlands to tall closed cover, they can transform Australian Painted Snipe habitat into areas that are no longer suitable. Hird Swamp in Victoria is an example where sections of the swamp are being actively managed to control the spread of these plants, resulting in the maintenance of suitable habitat for Australian Painted Snipe as well as other bird species. Fivebough Swamp in NSW is a good example of managed compartmentalisation of a modified natural wetland, to provide areas of habitat suitable for different species –including Australian Painted Snipe and Australasian Bittern which are priorities for conservation.

2.2.5 Climate variability and change

Drought is a natural part of Australia's climate and the present-day existence of the Australian Painted Snipe demonstrates that the species is well-adapted to cope with a dry climate. However, the relatively recent and rapid decrease in available habitat, coupled with prolonged or more frequent drought periods, could prove to have irreversible impacts on an already depleted population.

Declines in reporting rates within the Murray–Darling Basin, despite increased observer numbers and effort, might be explained by drought forcing the Australian Painted Snipe to move to drought refuges (Rogers et al. 2005). Hence there is a need to manage for drought across their range so that habitat is always available somewhere in the landscape.

The effect of climate change upon the Australian Painted Snipe and their habitat is unknown, however it is likely that the species will be affected. Chambers et al. (2005) reviewed the effects of climate change on birds, with particular reference to Australian species. Consequences as a result of climate change include increased severity of storm events, a reduction in rainfall and runoff and increasing temperatures. Evidence of global warming and cases of altered range, timing of migration, breeding success and population numbers are well known. As with drought risk management, climate change mitigation is needed to ensure that a network of suitable habitats across the continent is available for the Australian Painted Snipe.

2.2.6 Livestock overgrazing

A decline of the species in the Kimberley region has been attributed to cattle grazing (Johnstone and Storr 1980). However, other authors have suggested that grazing stock are unlikely to affect Australian Painted Snipe breeding activity in north-western Australia because inundated conditions at that time would limit stock access to the wetlands (Hassell and Rogers 2002). Many of the recent records are from grazing properties, like Roebuck Plains.

Australian Painted Snipe appear to have particular needs in terms of the structure of the vegetation for roost, foraging and nest sites, and this could be altered - or even maintained in some cases – according to various grazing regimes. In areas where exotic pastures have been introduced and are unlikely to be eliminated even in protected areas, such as Para Grass (*Urochloa mutica*) and Olive Hymenachne (*Hymenachne amplexicaulis*) in northern and eastern Australia, it will be necessary to maintain a certain level of grazing so that the Para Grass does not overrun the site and preferred habitat characteristics are maintained.

2.2.7 Invasive animals

Predation

Impacts of invasive animals within Australian Painted Snipe habitat are largely unknown and there is little evidence to suggest adverse impacts. Even though the Australian Painted Snipe favour nesting on mounds surrounded by water – which might be a behaviour to avoid predators – foxes and cats have been observed travelling through water. Consequently, Australian Painted Snipe adults and chicks are vulnerable to predation.

Invasive herbivores

Other invasive animals such as pigs, goats and deer degrade Australian Painted Snipe habitat by digging up wetland edges and removing vegetative cover. Similarly, camels and horses are capable of trampling wetland vegetation and nest sites.

2.2.8 Human disturbance

Human disturbance is not considered to be a major threat to the species but impacts could be locally severe if not managed appropriately. Breeding birds would be most vulnerable to disturbance. Ill-disciplined duck hunters and recreational fishers and even birdwatchers and photographers could have a direct impact by trampling vegetation and disturbing breeding Australian Painted Snipe. Hunters discharging weapons could also adversely impact the behaviour of the species. Other indirect impacts include discarded fishing gear and other rubbish.

2.2.9 Fire

Fire can have a negative effect on vegetation if it is uncontrolled, used too frequently, or used at an inappropriate time of year in relation to Australian Painted Snipe habitat. Hot or badly timed fires can remove too much vegetation (down to ground level) and have the effect of temporarily making the area structurally unsuitable. Fire can also leave soil vulnerable to erosion, which can lead to turbidity in the wetland. Hot and too-frequent fires can also affect certain plant species' seed germination and have longer-term effects of altering the floristics and habitat characteristics of the site. For example, frequent burning may gradually eliminate lignum communities in some wetlands, depriving colonial nesting waterbirds and others such as ducks and native-hens, of important nesting habitat (R. Jaensch, pers. comm 2020).

In certain circumstances, fire can be a useful management tool to reduce biomass and dead vegetation in order to open up the vegetation structure, promote fresh growth of native plants and to control invasive weeds. Canegrass swamps are an example where fire is used by graziers to promote green pick which, unintentionally, maintains habitat for the Australian Painted Snipe. In northern Australia, many ephemeral wetlands are regularly burnt through traditional cultural practices and this may maintain habitat structure that favours Australian Painted Snipe (M. Herring, pers. comm. 2019). Each burn needs to be carefully considered within the context of Australian Painted Snipe habitat and be appropriate for the relevant vegetation type.

2.2.10 Low genetic diversity

The estimated number of Australian Painted Snipe may now be down to 340 (range 270–410) mature individuals following declines in the last five years (Rogers et al. 2021). A small population is more susceptible to demographic and genetic stochastic events, which can impact the long-term survival of the population. Research is required to understand the genetic structure of Australian Painted Snipe and may be used to identify important populations and management units.

2.2.11 Threat prioritisation

Each of the threats outlined above has been assessed to determine the risk posed to the Australian Painted Snipe population using a risk matrix. This in turn determines the priority for actions outlined below. The threats were considered in the context of the current management regimes. The impact of that threat has been assessed assuming that existing management measures continue to be applied appropriately. If management regimes change, then the level of risk associated with threats may also change. The risk matrix considers the likelihood of an incident occurring and the consequences of that incident. Threats may act differently in different parts of the species range and at different times of year, but the precautionary principle dictates that the threat category is determined by the subpopulation at highest risk. Population-wide threats are generally considered to present a higher risk.

The risk matrix uses a qualitative assessment drawing on peer reviewed literature and expert opinion. In some cases the consequences of activities are unknown. In these cases, the precautionary principle has been applied. Levels of risk and the associated priority for action are defined as follows:

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

TABLE 2 Risk prioritisation

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

Categories for likelihood are defined as follows:

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

Categories for consequences are defined as follows:

- **Not significant** – no long-term effect on individuals or populations
- **Minor** – individuals are adversely affected but no effect at population level
- **Moderate** – population recovery stalls or reduces
- **Major** – population decreases
- **Catastrophic** – population extinction

TABLE 3 Australian Painted Snipe residual risk matrix

Likelihood of occurrence	Consequences				
	Not significant	Minor	Moderate	Major	Catastrophic
Almost certain			Structural changes to wetlands	Changes to water regimes Drainage of wetlands Non-indigenous weeds Changes to vegetation structure by native plants	
Likely		Fragmentation of waterways Deterioration of water quality Livestock overgrazing Predation Invasive herbivores Fire	Climate variability and change		
Possible		Human disturbance			
Unlikely				Low genetic diversity	
Rare or Unknown					

Chapter 3

Populations under particular pressure

The Australian Painted Snipe forms a single, homogenous breeding population across most of Australia except probably the interior western deserts and interior south-west Australia (Garnett et al. 2011). Therefore, the actions described in this Recovery Plan are designed to provide ongoing protection to the Australian Painted Snipe throughout its range.

Chapter 4

Recovery plan vision, objectives, and strategies

Long-term vision

The Australian Painted Snipe population has increased in size to such an extent that the species no longer qualifies for listing as threatened under any of the *Environment Protection and Biodiversity Conservation Act 1999* listing criteria.

Recovery plan objectives

By 2032, sustain a positive population trend (compared to 2020 baseline counts) in the number of mature individuals of the Australian Painted Snipe. This will be achieved by implementing the actions set out in this Recovery Plan that minimise threats while protecting the species' habitat throughout its range, generating new knowledge to guide recovery and increasing public awareness.

Strategies to achieve objectives

1. Manage and protect known Australian Painted Snipe habitat at the landscape scale
2. Develop and apply techniques to measure changes in population trajectory in order to measure the success of recovery actions
3. Reduce, or eliminate threats at breeding and non-breeding habitats
4. Undertake research to improve knowledge of the habitat requirements, biology and behaviour of Australian Painted Snipe
5. Engage community stakeholders to improve awareness of the conservation of Australian Painted Snipe
6. Coordinate, review and report on recovery progress

Chapter 5

Actions to achieve the specific objectives

Actions identified for the recovery of the Australian Painted Snipe are described below. It should be noted that some of the objectives are long-term and may not be achieved prior to the scheduled five-year review of the Recovery Plan. Priorities assigned to actions should be interpreted as follows:

Priority 1: Taking prompt action is necessary in order to mitigate the key threats to the Australian Painted Snipe and also provide valuable information to help identify long-term population trends.

Priority 2: Action would provide a more informed basis for the long-term management and recovery of the Australian Painted Snipe.

Priority 3: Action is desirable, but not critical to the recovery of Australian Painted Snipe or assessment of trends in that recovery.

STRATEGY 1 Manage and protect known Australian Painted Snipe habitat at the landscape scale

Action	Description	Priority	Performance criteria	Responsible agencies and potential partners [1]	Indicative cost
1a	Identify regions and sites of high conservation priority	1	• A review of existing information has been completed and important regions that require management intervention have been identified • A site inventory with habitat quality and management requirements has been developed	**Recovery team**	$25,000
1b	Protect areas of 'habitat critical for survival' not currently managed for nature conservation	1	• Unprotected Commonwealth and state owned land in areas of 'habitat critical for survival' for Australian Painted Snipe have been identified • Financial incentives have been made available to private landholders and Industry groups to voluntarily protect Australian Painted Snipe habitats • Management plans have been developed to maximise conservation values of the identified sites • Consideration has been given to formal protection for sites where appropriate (i.e. through new conservation reserves, national parks, state protected areas or private conservation agreements)	**Australian Government** **State governments** **Local governments** **NGOs** **Traditional Owners** Land and Sea Ranger Groups	Core government business
1c	Identify and map available habitat and assess habitat health	1	• Habitat currently used by the Australian Painted Snipe has been mapped and preferred habitat characteristics have been identified • Habitat health has been assessed at all locations where Australian Painted Snipe are observed breeding • Sites with poor habitat health have been identified and outcomes are reported to the Recovery team. • Sites with poor habitat health have been targeted for on-ground action and restoration	**Australian Government** **State governments** **Local governments** NRM regional bodies Academic institutions NGOs	$125,000
1d	Restore historical breeding habitat where feasible	2	• Historical breeding areas have been identified • The reasons for site abandonment have been identified • Sites for restoration have been prioritised • Restored sites have been monitored for Australian Painted Snipe	**State governments** **Local governments** **NRM regional bodies** Academic institutions	$125,000 pa

continued ...

STRATEGY 1 Manage and protect known Australian Painted Snipe habitat at the landscape scale continued

Action	Description	Priority	Performance criteria	Responsible agencies and potential partners [1]	Indicative cost
1e	Investigate and develop an approach for the creation of new breeding sites	2	• Opportunities for the creation or enhancement of wetland breeding habitat have been evaluated • Irrigation practices have been reviewed to determine opportunities for Australian Painted Snipe habitat creation • Best practice guidelines for wastewater and stormwater management have been published • Landholders have been encouraged to create Australian Painted Snipe friendly farm dams	**Australian Government** **State governments** **Local governments** **NRM regional bodies** Academic institutions NGOs	$125,000 pa
1f	Incorporate Australian Painted Snipe conservation priorities into state and local government wetland policies, plans and regulations	1	• New information on conservation measures for the Australian Painted Snipe have been incorporated into existing policies, management plans, regulations, code of practice and planning tools to better manage the population across its range	**Australian Government** **State governments** **Local governments** NRM regional bodies BirdLife Australia NGOs	Core government business

1 Lead organisations are identified in bold type.

STRATEGY 2 Develop and apply techniques to measure changes in population trajectory in order to measure the success of recovery actions

Action	Description	Priority	Performance criteria	Responsible agencies and potential partners [1]	Indicative cost
2a	Design an ongoing monitoring program for the Australian Painted Snipe	1	• A scientifically robust survey and reporting methodology has been developed, and agreed upon by the Recovery team • Novel monitoring techniques have been investigated, including e-DNA sampling methods to detect Australian Painted Snipe in wetlands, calls and infrared drones	**Recovery team** **Academic institutions** **NGOs**	$25,000
2b	Conduct regular, ongoing monitoring to assess population trends	1	• Australian Painted Snipe have been monitored at regular intervals across their range • Population size and trends have been assessed for each region and reported annually to the Recovery team, Commonwealth and state government agencies • A free and openly available central repository for reporting observations, such as the BirdLife Australia's Birdata, has been identified	**Recovery team** Australian Government State governments Local governments NRM regional bodies BirdLife Australia NGOs Academic institutions Traditional Owners	$135,000 pa
2c	Analyse survey data to increase understanding of population dynamics (e.g. population size, age cohort, dispersal rates)	1	• Knowledge on the population size and trend has increased • Baseline measures of current population size, and age structure are identified and dispersal rates have been assessed	**Academic institutions**	$10,000 pa

1 Lead organisations are identified in bold type.

STRATEGY 3 Reduce, or eliminate threats at breeding and non-breeding habitats

Action	Description	Priority	Performance criteria	Responsible agencies and potential partners [1]	Indicative cost
3a	Manage threats at known breeding and non-breeding habitats	1	• All major breeding areas have developed local management plans that address local threats • Management plans have been developed to maximise conservation values of the identified sites • Management plans have been adequately funded and implemented	**State governments** **Local governments** **NRM regional bodies** **Industry groups** Traditional Owners Land and Sea Ranger Groups	$80,000 pa
3b	Investigate the impact of potential threats such as human disturbance, fire and predation	2	• Knowledge of the impacts of invasive animals has improved • Knowledge of the human disturbance has improved • Knowledge of the impacts of fire on wetland habitats has improved • New knowledge has been incorporated into decisions on local management programs and interventions	**State governments** **Local governments** **NRM regional bodies** **BirdLife Australia** **NGOs** Academic institutions Traditional Owners	$50,000
3c	Develop and implement a management plan for the control or eradication of invasive plants where the species is found	2	• Where required, a management plan that prioritises the eradication or control of invasive species at all major breeding areas has been implemented	**State governments** **Local governments** **NRM regional bodies** BirdLife Australia NGOs Industry groups Traditional Owners Land and Sea Ranger Groups	$250,000 pa
3d	Use climate modelling techniques to investigate the potential influence of climate change on breeding and foraging habitats	1	• An improved understanding of the effects of climate change on Australian Painted Snipe population can be demonstrated • New knowledge has been incorporated into decisions on management interventions	**Academic institutions** BirdLife Australia NGOs	$60,000
3e	Investigate the impact of overgrazing on Australian Painted Snipe habitat	2	• Knowledge of over grazing impacts on Australian Painted Snipe has improved • Knowledge of feral herbivores impacts on Australian Painted Snipe has improved • Recommendations have been incorporated into local management plans • Management plans have been adequately funded and implemented	**State governments** **Local governments** **NRM regional bodies** BirdLife Australia NGOs Academic institutions Industry groups Traditional Owners Land and Sea Ranger Groups	$30,000 pa

1 Lead organisations are identified in bold type.

STRATEGY 4 Undertake research to improve knowledge of the habitat requirements, biology and behaviour of Australian Painted Snipe

Action	Description	Priority	Performance criteria	Responsible agencies and potential partners [1]	Indicative cost
4a	Accurately describe preferred habitat and define 'habitat critical for survival' for the Australian Painted Snipe	1	• Knowledge of preferred hydrological patterns have improved and have been described • Knowledge of preferred vegetation structure and characteristics have improved and have been described • Knowledge generated has been used to accurately define 'habitat critical for survival' • New knowledge has been incorporated into decisions on management interventions	**State governments** **Local governments** **NRM regional bodies** **BirdLife Australia** **NGOs** **Academic institutions** Traditional Owners	$75,000 pa
4b	Develop management guidelines for Australian Painted Snipe habitat	1	• Guidelines have been developed and include management principles for breeding and non-breeding habitats, vegetation characteristics, appropriate hydrological regimes, control of invasive species and overgrazing	**State governments** **Local governments** **NRM regional bodies** **BirdLife Australia** **NGOs** **Industry groups** **Traditional Owners** Land and Sea Ranger Groups	$50,000
4c	Undertake research on breeding success, survival and causes of mortality	1	• Knowledge of breeding success, survival and causes of mortality have improved • New information has been generated for multiple regions	**State governments** **BirdLife Australia** **NGOs** **Academic institutions** Traditional Owners	$75,000 pa
4d	Undertake research on local and long-distance movements through the landscape	1	• Knowledge of movements have improved • New information has been generated for multiple regions	**State governments** **BirdLife Australia** NGOs Academic institutions Traditional Owners	$75,000 pa
4e	Undertake diet analysis over multiple spatial and temporal scales	3	• Knowledge of diet has improved • New information has been generated for multiple regions	**State governments** **BirdLife Australia** NGOs Academic institutions	$75,000 pa
4f	Investigate the population genetics of Australian Painted Snipe	3	• Knowledge of the population structure has improved • New knowledge has been incorporated into decisions on management interventions	**Academic institutions**	$75,000 pa
4g	Undertake research on vocalisations and behaviour	3	• Knowledge of the Australian Painted Snipe advertising call has improved	**Academic institutions**	$75,000 pa

1 Lead organisations are identified in bold type.

STRATEGY 5 Engage community stakeholders to improve awareness of the conservation of Australian Painted Snipe

Action	Description	Priority	Performance criteria	Responsible agencies and potential partners [1]	Indicative cost
5a	Develop and implement a broad strategy to raise awareness and educate the general public about the Australian Painted Snipe conservation	2	• Articles about Australian Painted Snipe conservation, including threats and recovery actions, have been published in community newsletters, local bulletins and newspapers • Informative displays have been developed to educate the broader community about Australian Painted Snipe conservation at key breeding sites and non-breeding areas	**BirdLife Australia** **NGOs** **Industry groups** **Traditional Owners** Land and Sea Ranger Groups	$25,000 pa
5b	Develop and implement a targeted strategy to promote the use of citizen science in relation to the Australian Painted Snipe conservation	2	• Articles have been published in relevant community newsletters and magazines to advertise the central repository for observations and encourage citizen scientists' involvement in Australian Painted Snipe conservation	**BirdLife Australia** **NGOs** Traditional Owners	$25,000 pa
5c	Support and train volunteers to monitor Australian Painted Snipe	1	• An Australian Painted Snipe Fact Sheet has been developed • The Fact Sheet has been disseminated to state agencies, landholders, Industry groups and community volunteers • Annual training sessions with landholders, Industry groups Traditional Owners, Ranger Groups and community volunteers in order to achieve 'best practice' in terms of breeding habitat management have occurred	**BirdLife Australia** **NGOs** **Industry groups** **Traditional Owners** **Land and Sea Ranger Groups**	$75,000 pa

1 Lead organisations are identified in bold type.

STRATEGY 6 Coordinate, review and report on recovery process

Action	Description	Priority	Performance criteria	Responsible agencies and potential partners [1]	Indicative cost
6a	Establish and maintain a National Recovery Team for the Australian Painted Snipe	1	• A National Recovery team is established within the first six months of the making of the recovery plan • The Recovery team coordinates, reviews and reports on the recovery outcomes for the life of this plan	**All**	Core government business
6b	Approve Recovery Team governance arrangements	1	• Terms of Reference of the Recovery team are approved in accordance with national best practise guidelines • The Recovery team is nationally registered	**Recovery team**	Core government business
6c	Submit annual reports on progress against recovery actions	1	• Recovery team annual reports have been submitted each year in accordance with the national reporting framework	**Recovery team**	Core government business
6d	Review the recovery plan five years after making	1	• In consultation with relevant stakeholders, a five review of the recovery plan has been endorsed by the Recovery team	**Recovery team**	$10,000

1 Lead organisations are identified in bold type.

Chapter 6

Duration and cost of the recovery process

It is anticipated that the recovery process will not be achieved prior to the scheduled five-year review of the Recovery Plan. The cost of implementation of this plan should be incorporated into the core business expenditure of the affected organisations and through additional funds obtained for the explicit purpose of implementing this Recovery Plan. It is expected that Commonwealth, state and territory agencies will use this plan to prioritise actions to protect the species and enhance their recovery, and that projects will be undertaken according to agency priorities and available resources.

In order to maximise the conservation outcomes and cost effectiveness of this plan, it is intended that the recovery actions proposed complement, where possible, those of other protected matters. The indicative cost of recovery plans actions was derived from expert elicitation and public comments received in 2020.

TABLE 4 Summary of recovery actions and estimated costs in for the first five years of implementation (these estimated costs do not take into account inflation over time

Action	Cost (as of 2020)					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Strategy 1	$275,000	$375,000	$250,000	$250,000	$250,000	**$1,400,000**
Strategy 2	$170,000	$145,000	$145,000	$145,000	$145,000	**$750,000**
Strategy 3	$360,000	$420,000	$360,000	$410,000	$360,000	**$1,910,000**
Strategy 4	$450,000	$450,000	$500,000	$450,000	$450,000	**$2,300,000**
Strategy 5	$125,000	$125,000	$125,000	$125,000	$125,000	**$625,000**
Strategy 6	$0	$0	$0	$0	$10,000	**$10,000**
TOTAL	**$1,380,000**	**$1,515,000**	**$1,380,000**	**$1,380,000**	**$1,340,000**	**$6,995,000**

Chapter 7

Effects on other native species and biodiversity benefits

The Recovery Plan focuses on the protection, restoration and creation of freshwater ephemeral wetlands, the principal breeding habitat for the Australian Painted Snipe. Australia has a diverse waterbird fauna adapted to these unpredictable habitats (Kingsford and Norman 2002), exploiting their high productivity when flooded after having dried out (Taylor 2003). Consequently, appropriate management of these wetlands will benefit many plant and animal species, as well as associated ecological communities.

Migratory shorebirds such as Wood Sandpiper (*Tringa glareola*), Sharp-tailed Sandpiper (*Calidris acuminata*), Red-necked Stint (*Calidris ruficollis*), Curlew Sandpiper (*Calidris ferruginea*), Marsh Sandpiper (*Tringa stagnatilis*), Black-tailed Godwit (*Limosa limosa*) and Latham's Snipe (*Gallinago hardwickii*) have been seen using wetlands while Australian Painted Snipe are present. Other inland-breeding resident shorebirds such as Red-kneed Dotterel (*Erythrogonys cinctus*), Black-winged Stilt (*Himantopus himantopus*) and Red-necked Avocet (*Recurvirostra novaehollandiae*) have been found nesting near Australian Painted Snipe and may also benefit from the protection and restoration of freshwater ephemeral wetlands (Rogers et al. 2005). In total, Rogers et al. (2005) listed twenty-one species of threatened birds at Hird Swamp that could also benefit from a 'Painted Snipe Management Regime'.

In the rice fields of southern New South Wales, Australian Painted Snipe occur alongside the Endangered Australasian Bittern (*Botaurus poiciloptilus*), and present challenges for targeted conservation management because of their conflicting habitat requirements (Herring and Silcocks 2014).

Wetlands surrounding Broad Sound, Central Queensland, where three breeding records of Australian Painted Snipe were obtained in the 2000s (e.g. Jaensch et al. 2004; Black et al. 2010), form the core refuge and main breeding area for the Critically Endangered Capricorn Yellow Chat. Management of wetlands on these grazed coastal plains to favour Australian Painted Snipe is broadly likely to also deliver favourable habitat for the chat—as well as all the migratory shorebirds listed above.

The wide distribution and unpredictable nature of temporary freshwater wetlands makes it difficult to identify population trends of species within them. As a result, it is possible that there are other species in these habitats that are threatened, but not yet recognised as such. The Australian Painted Snipe, an unusually attractive and enigmatic resident waterbird, may be of value as a flagship species to highlight the importance of conserving these wetlands – over a very wide area of the Australian continent.

Chapter 8

Social and economic considerations

Wetlands are a vital element of national and global ecosystems and economies. At the most fundamental level, wetlands are a key part of the water cycle, playing critical roles in maintaining the general health of Australia's rivers, estuaries and coastal waters. Wetlands protect our shoreline from wave action, mitigate the impacts of floods, absorb pollutants and provide habitats for animals and plants, including a number of species that are threatened. Wetlands are also critical to maintaining and improving our quality of life. They provide tangible benefits to the Australian economy, such as employment opportunities. Wetlands purify our water and are a focal point for recreational activities.
They provide nurseries for fish and other freshwater and marine life and, as such, are of critical importance to Australia's commercial and recreational fishing industries. In some areas, wetlands support grazing, forestry and cropping activities.

Controls on further development of wetland habitats may impact on some landowners, land managers, industry groups and developers. Provision of environmental flows to selected wetlands to promote breeding by the Australian Painted Snipe may have some costs to other potential water users. However, the ecological services provided by healthy wetlands are generally considered to be substantial.

Currently in Victoria, wetlands known to contain Australian Painted Snipe are managed to reduce any impacts from duck hunting – for example, sections of Hird Swamp that contain breeding and foraging habitat are seasonally closed to duck hunters. Rehabilitation efforts at wetlands such as Hird Swamp in Victoria and Fivebough Swamp in NSW serve as examples of awareness raising about healthy wetlands and their habitat; threatened species conservation; and the ecologically sustainable use of water.

A large network of community volunteers across Australia actively participate in BirdLife Australia's coordinated annual surveys for migratory shorebirds and wetland birds. Involvement can provide social benefits with community members and engaged groups having a sense of achievement, inclusion, community spirit and pride whilst gaining enjoyment and appreciation of their surrounding natural environment. The community education components of the program also promote community ownership, provide community support and encourage active involvement in protecting local natural resources.

In addition, there is the potential for economic gains through ecotourism ventures, nature tours and holiday accommodation operators in areas where the Australian Painted Snipe can reliably be seen. Additional social benefits include encouraging passive recreation, appreciation of natural aesthetic values and increased awareness and appreciation of Indigenous cultural values.

Chapter 9
Affected interests

Organisations likely to be affected by the actions proposed in this plan include: government agencies (Commonwealth, state and territory, local), particularly those involved with wetland environments and conservation programs; private landholders; Indigenous land and sea management groups (including ranger programmes); researchers; bird watching groups; conservation groups; wildlife interest groups; environmental consulting companies; tourism operators; industry and commercial bodies; and, proponents of development in the vicinity of important wetland habitat. However, this list should not be considered exhaustive, as there may be other interest groups that would like to be included in the future or need to be considered when specialised tasks are required.

The following table lists some of the interest groups, how they could contribute to the success of the plan and the potential benefits/impacts that may emerge from the Plan's implementation:

TABLE 5 Affected interests and their contribution to the Recovery Plan

Interest group	Contribution	Impacts/benefits
Australian Government	• Responsible for development, coordination and evaluation of the plan • Responsible for implementation of the plan in Commonwealth areas • Subject to available resources, providing financial support for implementation of the plan	• Informed decision making regarding the EPBC Act referral and assessment process • Greater ability to deliver on domestic and international obligations with regard to biodiversity conservation • Increased knowledge of the Australian Painted Snipe and their habitats – increased exchange of information between decision makers and the community
State and territory government agencies	• Contributing to the development of the plan • Potential implementation of the plan within jurisdictional boundaries	• Greater ability to deliver on state obligations with regard to biodiversity conservation • Increased knowledge of the Australian Painted Snipe and their habitats – increased exchange of information
Local Government	• Contributing to the development of the plan and taking the plan into consideration when reviewing planning schemes • Potential implementation of on ground activities within jurisdictions	• Increased knowledge of the Australian Painted Snipe and their habitats – increased exchange of information • Enhanced ability to deliver obligations with regard to biodiversity conservation • Supports local tourism industry
Natural Resource Management (NRM) regional bodies	• Integrating the plan into NRM regional plans • Opportunity to deliver on-ground activities	• Increased awareness of regional importance of important habitat sites. Informing managers of biodiversity values • Opportunity to seek funding for conservation projects under biodiversity conservation programs
Land councils and Traditional Owners including those that have co-management or sole management responsibilities for important habitats.	• Contributing to the development of the plan and development and implementation of site management plans – research and monitoring activities – contributing traditional knowledge	• Increased knowledge of the Australian Painted Snipe and their habitats – increased exchange of information • Opportunity to seek funding for conservation projects and achieve ownership of projects • Develop research partnerships with scientists and the community
Conservation Groups	• Contributing to the implementation and evaluation of the plan, particularly in conducting research and monitoring programs – implementing on ground activities	• Opportunity to seek funding for conservation and awareness projects under biodiversity conservation programs • Greater coordination of targeted conservation projects • Delivering on charitable/not-for-profit goals benefiting the public
Community and Special Interest groups	• Contributing to the plan and volunteering for conservation activities – implementing on ground activities	• More Australian Painted Snipe to enjoy • Opportunity to participate in conservation projects

continued ...

TABLE 5 Affected interests and their contribution to the Recovery Plan continued

Interest group	Contribution	Impacts/benefits
Researchers	• Contributing to the implementation and evaluation of the plan	• Increased exchange of information – opportunity to seek funding for research • Opportunity to establish collaborations within Australia and internationally
Recreational users of sites – wetland users, 4WD groups, recreational fishers, horse groups, field and game groups.	• Contributing to the development of the plan	• Some leisure activities that affect important habitat sites may need to be managed • These groups will be one of the main recipients for education and awareness activities that focus on how they may continue their activities and contribute to the conservation of waterbirds at the same time
Landholders	• Contributing to the development and implementation of the plan	• These groups will be the target of education and awareness activities. Particularly on how site management plans may be implemented by landholders • Opportunity to build incentives into the plan for landholders to comply with recommendations • Enhance certainty with regard to EPBC referrals
Commercial users of sites or surrounding area – agriculture, mining, commercial fisheries, farmers (surrounding land use), airports, maritime ports, renewable energy, tourism operators	• Contributing to the Plan and implementing measures that minimise the impact of their operations on waterbirds	• These groups will also be one of the main recipients for education and awareness activities, although theirs will focus on minimising the impacts of their operations on the Australian Painted Snipe and the habitats on which they depend • Enhance certainty with regard to EPBC referrals

Chapter 10
Consultation

The *National Recovery Plan for the Australian Painted Snipe* (2022) has been developed through extensive consultation with a broad range of stakeholders. The consultation process brought together key species experts and conservation managers, from a range of different organizations, to categorize ongoing threats to the Australian Painted Snipe, and identify knowledge gaps and potential management options. Consultation included representatives from government agencies, non-government organisations, researchers, Indigenous communities and local community groups. During the drafting process the Department of Climate Change, Energy, the Environment and Water (Cwlth) continued to work closely with key stakeholders interested in the conservation of Australian Painted Snipe and their wetland habitats.

Notice of the draft plan was made available for public comment for three months between 20 December 2019 and 17 April 2020. Any comments received that were relevant to the survival of the species were considered by the Threatened Species Scientific Committee as part of the development of this plan.

Chapter 11

Organisations/persons involved in evaluating the performance of the plan

This plan should be reviewed no later than five years from when it was endorsed and made publicly available. The review will determine the performance of the plan and will be coordinated by the Department of Climate Change, Energy, the Environment and Water in association with relevant Australian and state and territory government agencies and key stakeholder groups such as non-governmental organisations, local community groups and scientific research organisations.

Key stakeholders who may be involved in the review of the performance of the *National Recovery Plan for the Australian Painted Snipe*, include organisations likely to be affected by the actions proposed in this plan and are expected to include:

Australian Government

- Department of Climate Change, Energy, the Environment and Water

State/territory governments

- Department of Environment and Science (Qld)
- Department of Planning and Environment (NSW)
- Environment, Planning and Sustainable Development Directorate (ACT)
- Department of Environment, Land, Water and Planning (Vic)
- Department of Environment and Water (SA)
- Department of Biodiversity, Conservation and Attractions (WA)
- Department of Environment and Natural Resources (NT)
- Natural resource management bodies
- Local government

Non-government organisations

- BirdLife Australia
- Local conservation groups
- Local communities
- Private landholders
- Indigenous communities
- Universities and other research organisations
- Industry
- Recreational sports and associations

Chapter 12

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