

Ecological Character Description Addendum

Edithvale-Seafood Wetlands



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Author

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Photo credit

Edithvale Wetland, Edithvale-Seaford Wetlands. Dr William Steele, Melbourne Water.

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1. Introduction

An ecological character description (ECD) for the Edithvale-Seafood Wetlands was published in 2012 (DSE 2012) but drafted prior to 2008 and did not follow the *National Framework and Guidance for Describing the Ecological Character of Australia's Ramsar Wetlands* (Department of the Environment, Water, Heritage and the Arts 2008). The ECD identifies critical ecosystem services does but not identify critical components and processes and does not contain any Limits of Acceptable Change (LAC) for critical components, processes and services (CPS). The benchmark description of the site, however, is thorough and reflects conditions at the time of listing. This addendum includes out the following amendments to the ECD.

- There has been a review of the Criteria for Identifying Wetlands of International Importance (Ramsar criteria) met by the site.
- A translation has been made of the identified ecosystem services in the ECD to critical CPS following the requirements of the national framework (Department of the Environment, Water, Heritage and the Arts 2008).
- LAC have been developed for the critical CPS.
- A list of threats to the Ramsar site has been added.

2. Ramsar criteria

2.1 Changes resulting from a review of the Ramsar criteria

This review, based on a more rigorous application of the Ramsar guidance, indicates that the Edithvale-Seafood Wetlands Ramsar Site met three of the current nine criteria at the time of listing in 2001 (criteria 2, 4 and 6) but not criteria 1 and 3 as claimed in DSE (2012).

A check of recent additions of species as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) has resulted in an additional species being identified as contributing to Criterion 2 being met.

Criterion 4 was not considered to have been met in DSE (2012). However, there is evidence that the site met, and continues to meet, this criterion as it supports wetland-dependent species during the critical lifecycle stages of migration and breeding.

The changes are summarised in Table 1.

Table 1. Summary of changes to the criteria met by the Edithvale-Seafood Wetlands compared with DSE (2012).

Ramsar listing criteria	Criteria met		Comments Changes since DSE (2012)
	At listing	Currently	
Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.	Yes	Yes	The curlew sandpiper was listed as critically endangered under the EPBC Act in 2015 and was not identified as meeting this criterion in DSE (2012). The site meets this criterion for Australasian Bittern and curlew sandpiper.
Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their lifecycles, or provides refuge during adverse conditions.	Yes	Yes	Not considered met in DSE (2012). The site supports wetland-dependent species during the critical lifecycle stages of migration and breeding.

Criterion 6: A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.	Yes	Yes	No change
Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.	No	No	More rigorous application of the Ramsar guidance indicates these criteria were not met at listing
Criterion 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.	No	No	

2.2 Justification for the site not meeting Ramsar criteria 1 and 3

Criterion 1

A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.

The appropriate bioregion for the site is the South East Coast (Victoria) drainage division which includes all of the coastline of Victoria and a small portion of the southern NSW and South Australian coasts (Department of the Environment, Water, Heritage and the Arts 2008). There is no comprehensive wetland inventory for this bioregion. As such the application of the terms “representative” and “rare” are difficult. In terms of “representative”, advice from the Convention (Ramsar 2009) is that contracting parties should select the “best examples” of each wetland type within a bioregion and that the wetlands should be in “near-natural” condition.

The Edithvale-Seaford wetlands are remnants of what was once the Carrum Carrum Swamp, a large freshwater wetland, largely drained in the late 19th century. The wetlands currently are highly modified and part of a regional drainage system for storing stormwater from surrounding urban landscapes. It is difficult to make the argument that these sites are rare, representative or near-natural. As such, the site does not meet this criterion and did not meet it at the time of listing.

Criterion 3

A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.

Guidance from the Convention indicates that this criterion should be applied to “hotspots” of biological diversity and centres of endemism within a biogeographically region. As with criterion 1, the relevant bioregion is the South East Coast (Victoria) drainage division, for which an inventory of wetland dependent species and biodiversity hotspots is not available.

The ECD assessed biodiversity using the much smaller Gippsland Plains bioregion and considered that the site may meet this criterion on the basis of waterbird diversity and vegetation communities. The ECD indicates that a total of 75 species of waterbird have been recorded within the site (this list includes species that regularly occur as well as vagrants and isolated records). The site is within the same bioregion as a number of other Ramsar sites and significant wetland complexes, which have higher species counts than Edithvale-Seaford Wetlands:

- Port Phillip Bay (Western Shoreline) and Bellarine Peninsula - 129 waterbird species
- Gippsland Lakes –86 waterbird species
- Glenelg Estuary and Discovery Bay Wetland Complex - 95 waterbird species and
- Piccaninnie Ponds Karst Wetlands - 79 waterbird species.

The ECD also suggested that the Edithvale-Seafood Wetlands supported a high diversity of vegetation communities. However, most of those that are described in the ECD are terrestrial and highly modified from natural. Given the extent of the bioregion and the high value wetlands that occur in the South East Coast (Victoria) drainage division, the modified vegetation communities at Edithvale-Seafood do not represent the best examples in the bioregion. As such, the site does not meet this criterion and did not meet it at the time of listing.

2.3 Updated justification for Ramsar criteria met

Criterion 2

A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

This criterion is only applied to wetland dependent flora and fauna that are regularly supported at a Ramsar site. The site regularly supports two fauna species listed under the EPBC Act and or IUCN Red List:

- Australasian bittern (*Botaurus poiciloptilus*) – Endangered (EPBC and IUCN)
- Curlew sandpiper (*Calidris ferruginea*) – Critically endangered (EPBC).

The curlew sandpiper was only listed as critically endangered under the EPBC Act in 2015 and, hence was not identified as meeting this criterion in DSE (2012).

Two other nationally threatened species have been recorded in the site but are not regularly supported. There is a single record of the Australian painted snipe (*Rostratula australis*) from Edithvale in 2008 (BirdLife Australia unpublished data) and a record of two growling grass frogs (*Litoria raniformis*) from 1988.



The Australasian bittern. Photo: John Barkla, Birdlife Australia.

Criterion 4

A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their lifecycles, or provides refuge during adverse conditions.

The basic description of this criterion implies a number of common functions and roles that wetlands provide including supporting fauna during migration, providing drought refuge, supporting breeding and moulting in waterfowl. Twenty species of waterbirds listed under international migratory agreements have been recorded within the Ramsar site. This number includes species that, in Australia, are residents (e.g. eastern

great egret) and a number of migratory species that are occasionally recorded at the site. There are eight species of international migratory shorebirds that are regularly supported (two thirds of seasons) by the Edithvale-Seafood Wetlands Ramsar Site (Table 2).

Table 2. Palaeartic migratory waders recorded in the Ramsar site and their frequency of occurrence (percentage of years recorded). The eight species that the site is considered to regularly support are highlighted in bold.

Common name	Species name	JAMBA	CAMBA	ROKAMBA	Frequency of occurrence
Australian painted snipe	<i>Rostratula australis</i>		X		5
Common greenshank	<i>Tringa nebularia</i>	X	X	X	86
Curlew sandpiper	<i>Calidris ferruginea</i>	X	X	X	68
Latham's snipe	<i>Gallinago hardwickii</i>	X	X	X	100
Long-toed stint	<i>Calidris subminuta</i>	X	X	X	14
Marsh sandpiper	<i>Tringa stagnatilis</i>	X	X	X	68
Pectoral sandpiper	<i>Calidris melanotos</i>	X	X	X	68
Red knot	<i>Calidris canutus</i>	X	X	X	5
Red-necked stint	<i>Calidris ruficollis</i>	X	X	X	73
Sharp-tailed sandpiper	<i>Calidris acuminata</i>	X	X	X	100
Wood sandpiper	<i>Tringa glareola</i>	X	X	X	68

There are records of over 20 species of waterbird breeding within the Ramsar site (Silcocks et al. 2006, Silcocks and O'Connor 2009, 2009, Silcocks 2013). The most commonly recorded breeding waterbird species are black swan (*Cygnus atratus*), chestnut teal (*Anas castanea*), blue-billed duck (*Oxyura australis*), dusky moorhen (*Gallinula tenebrosa*) and purple swamphen (*Porphyrio porphyrio*). There are also breeding records of wetland dependent raptors (e.g. swamp harrier; *Circus approximans*) and other wetland dependent birds (e.g. clamorous reed warbler; *Acrocephalus stentoreus*) breeding in the site (BirdLife Australia unpublished data).

This criterion was met at the time of listing and continues to be met.

Criterion 6

A wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird.

Ramsar Convention guidance indicates that assessment of this criterion should be made using the most recent official population estimates (Wetlands International 2012). Data provided by BirdLife Australia indicate that two species meet this criterion:

- Sharp-tailed sandpiper (*Calidris acuminata*) – average annual maximum abundance (1994 - 2015) = 1870 (slightly above the 1 % of population estimate of 1600)¹.
- Australasian bittern (*Botaurus poiciloptilus*)– average annual maximum abundance (1994 - 2015) = 5 (equivalent to the 1 % of population estimate).

1. Due to concerns regarding ongoing population declines of many species of migratory shorebird in Australia, the Department of the Environment and Energy commissioned population estimate updates for 37 species. These are reported in Hansen et al. (2016). The 2016 estimate of the population of sharp-tailed sandpiper in the East Asian-Australasian Flyway is 85,000 which is approximately half the Wetlands International (2012) estimate of 160,000, indicating that the site could support 2% of the flyway population. The methods used by Hansen et al. to estimate population size are different to those in previous population estimates by Wetlands International. Therefore, they do not necessarily represent actual increases or decreases in population size and cannot be used to infer trends. The estimates by Hansen et al. have not been used to identify if species meet the 1% criterion because Ramsar Convention guidance states that:

“To ensure international comparability, where possible, Contracting Parties should use the international population estimates and 1% thresholds published and updated every three years by Wetlands International as the basis for evaluating sites for the List using this criterion.”



Sharp-tailed sandpiper. Photo: John Barkla Birdlife Australia.

Although numbers of each species are highly variable (Figure 1 and Figure 2), averages over the record period 1994 to 2015 indicate the 1% threshold is met. In addition, the Australasian bittern is a known cryptic species often only observed via calls and it is likely that actual numbers are higher than counts indicate.

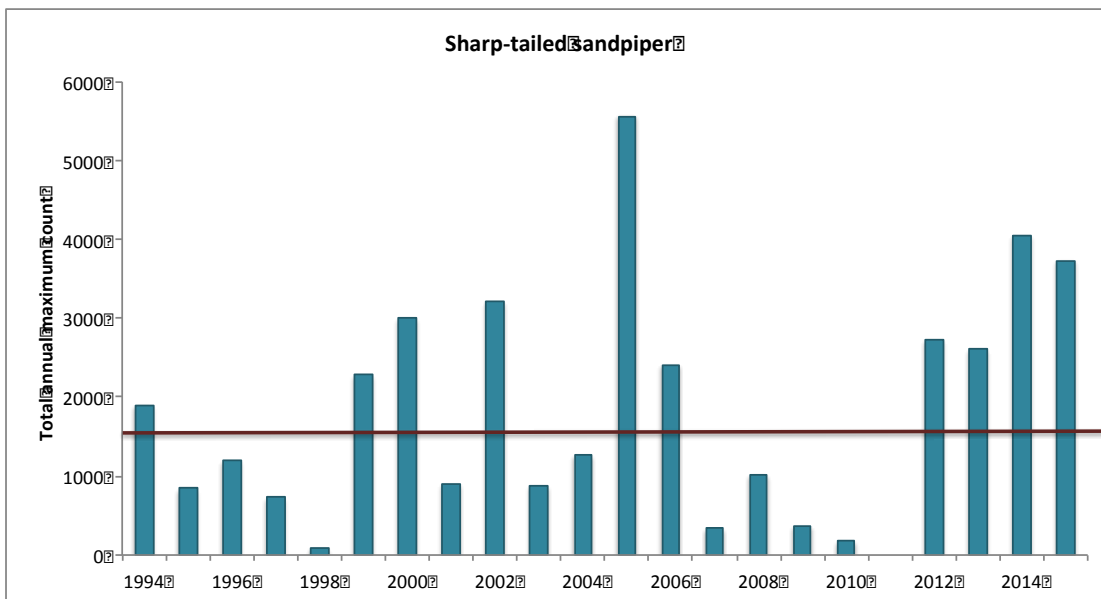


Figure 1. Maximum annual abundance of sharp-tailed sandpipers at Edithvale-Seafood Wetlands 1994 to 2015 (data from BirdLife Australia).

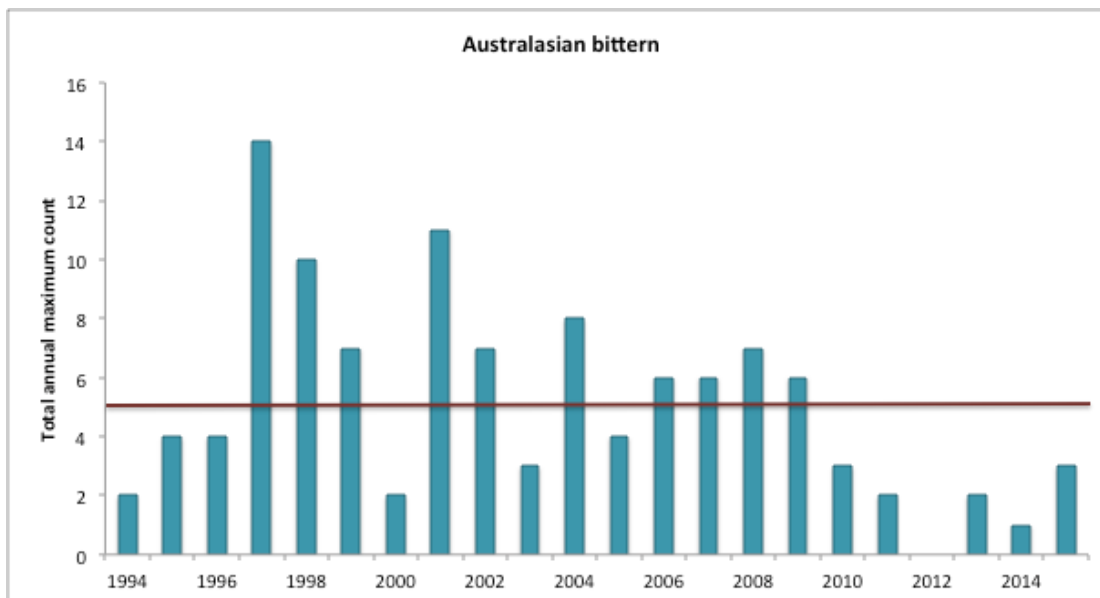


Figure 2. Maximum annual abundance of Australasian bitterns at Edithvale-Seaford Wetlands 1994 to 2015 (data from BirdLife Australia).

3. Critical components, processes and services

The ECD for the Edithvale-Seaford Wetlands Ramsar Site was drafted prior to the release of the national framework for describing the ecological character of Australian Ramsar Wetlands (Department of the Environment, Water, Heritage and the Arts 2008). It does not identify critical components, process and services, but rather, describes the ecological character in terms of ecosystem services and the components and processes that support those services. The basic description of the character of the site is comprehensive and describes conditions at the time of listing. The framework indicates that the minimum components, processes, benefits and services, which should be included in an ECD are those (Department of the Environment, Water, Heritage and the Arts 2008):

1. that are important determinants of the site's unique character.
2. that are important for supporting the Ramsar criteria under which the site was listed.
3. for which change is reasonably likely to occur over short to medium time scales (less than 100 years) and
4. that will cause significant negative consequences if change occurs.

Applying these criteria results in the identification of four critical components, process and services at the Edithvale-Seaford Ramsar site:

- waterbird diversity and abundance described in ECD section 5.4 Diversity of waterbird species
- waterbird breeding described in ECD section 3.2
- physical habitat for waterbirds described in ECD section, 5.4 Regularly supports 1% of Sharp-tailed Sandpipers and 6.3 and
- threatened wetland species described in ECD section 5.3.

4. Limits of Acceptable Change

The ECD for the Edithvale-Seaford Wetlands does not contain LAC and, while it does have statements describing points of potential change in character, these are not quantitative and were developed prior to national guidelines on setting LAC (<https://www.environment.gov.au/water/wetlands/publications/factsheet-limits-acceptable-change>). LAC are proposed for the Edithvale-Seaford Ramsar site that reflect conditions at the time of listing (Table 3).

Confidence levels have been assigned to each LAC based on the degree to which the authors are confident that the LAC represents the point at which a change would occur. These are assigned as follows:

- High – Quantitative site-specific data; good understanding linking the indicator to the ecological character of the site; LAC is objectively measurable.
- Medium – Some site-specific data or strong evidence for similar systems elsewhere derived from the scientific literature; or informed expert opinion; LAC is objectively measurable.
- Low – No site-specific data or reliable evidence from the scientific literature or expert opinion, LAC may not be objectively measurable and/or the importance of the indicator to the ecological character of the site is unknown.

LAC are a tool by which ecological change can be measured. However, ECDs are not management plans and LACs do not constitute a management regime for the Ramsar site.

Exceeding or not meeting LACs does not necessarily indicate that there has been a change in ecological character within the meaning of the Ramsar Convention. However, exceeding or not meeting LACs may require investigation to determine whether there has been a change in ecological character.



Edithvale Wetland. Photo. Yvette Baker

Table 3. LAC for the Edithvale-Seaford Ramsar Site.

Critical CPS	Evidence	Limit of Acceptable Change	Confidence in LAC
Waterbird diversity and abundance	<p>The Edithvale-Seaford Wetlands support a diversity and abundance of waterbirds. Data from BirdLife Australia, indicate annual fluctuations in waterbird numbers (Figure 3). Waterbird guilds (as defined by Kingsford et al. 2012) reflect diversity and abundance. The average numbers (1994 to 2015) in each guild are as follows (BirdLife Australia unpublished data):</p> <p>Total waterbirds – 5400 Migratory waders – 1900 Australasian waders - 250 Ducks - 1300 Fishers - 400 Large wading birds - 200 Herbivores – 970</p> <p>LAC is based on a 50% decline in annual maximum counts over a five-year period to account for annual variability.</p> <p>There is concern about large scale declines in waterbird numbers in eastern Australia (Kingsford et al. 2014). A sustained decline following the Millennium drought has not yet been established, as there has been some recovery (Colloff et al. 2015) and in some locations with permanent water sources, waterbird numbers increased during the drought as birds migrated to this habitat, and declined post drought, when birds moved back into the landscape in 2010 – 2012 floods (Loyn et al. 2014).</p>	<p>Abundance of waterbirds will not decline below the following (calculated as a rolling five-year average of maximum annual count):</p> <p>Total waterbirds – 2500 Migratory waders – 900 Australasian waders - 125 Ducks - 650 Fishers - 200 Large wading birds - 100 Herbivores – 450</p>	High
	<p>The Ramsar site regularly supports > 1% of the population of two species: Australasian bittern and sharp-tailed sandpiper. Australasian bittern are a cryptic species that can be difficult to reliably detect and count (McKilligan 2005, O'Donnell et al. 2013). To reflect this, the LAC for this threatened species is based on presence (see LAC below).</p> <p>Mean maximum annual count of sharp-tailed sandpipers (1994 – 2015) is 1870 (BirdLife Australia unpublished data). In order for the LAC to reflect changes at the site (as opposed to broader population changes), the LAC is based on comparing the mean maximum annual count with the most up to date population estimate from Wetlands International, noting that Wetlands International periodically updates population estimates. The most recent update was in 2012.</p>	<p>Abundance of sharp-tailed sandpiper will not decline below 0.5% of the population as stated in the most up to date Wetlands International Population estimate (based on a five-year rolling average of annual maximum counts).</p>	High

Critical CPS	Evidence	Limit of Acceptable Change	Confidence in LAC
Waterbird breeding	<p>Twenty species of wetland dependent bird species have been recorded breeding within the Ramsar site. Of these, seven species are regularly recorded breeding (> two thirds of seasons) (Silcocks et al. 2006, Silcocks and O'Connor 2009, 2010, 2011, Silcocks 2012, 2013):</p> <p>Black swan Blue-billed duck Chestnut teal Dusky moorhen Purple swamphen Swamp harrier Clamorous reed warbler</p>	<p>Breeding of the following species at least once every five years:</p> <p>Black swan Blue-billed duck Chestnut teal Dusky moorhen Purple swamphen Swamp harrier Clamorous reed warbler</p>	High
Physical habitat for waterbirds	<p>Hydrology and vegetation type have been identified as the most important habitat components for supporting waterbirds at the Ramsar site (Tzaros and Silcocks 2004). The wetlands have been divided into habitat zones and three zones are considered most important for waterbirds (Quinn et al. 2016):</p> <p>Edithvale (Figure 4):</p> <ul style="list-style-type: none"> • Edithvale North 1 - deeper water for a number of duck species, surrounded by tall reeds; and • Edithvale South 1 – shallow wetlands that are seasonally dry providing foraging habitat for shorebirds, grading to tall marsh at the fringes, providing cover for species such as Australasian bittern and Latham's snipe. <p>Seaford (Figure 5):</p> <ul style="list-style-type: none"> • North 2 Pool, Seaford Central West 1 and Seaford Central East 2 – mosaic of deeper water, tall marsh, deeper saline ponds important for all wetland bird species. <p>The mosaic nature of the habitat is what supports the broad range of species. LAC is based on maintaining this mosaic. As wetland habitats within habitat zones have not been mapped, the LAC is based on maintaining the range of habitat types within the Ramsar site.</p>	<p>Wetland habitat that comprises open water, emergent native vegetation (sedges, rushes and reeds) and exposed mudflats.</p>	Medium
Threatened species: birds	<p>There is data available for the two threatened bird species that occur regularly within the site (BirdLife Australia unpublished data). While occurrence of the two species is regular (68% for curlew sandpiper; and 95% for Australasian bittern) abundance data for both species is low.</p>	<p>Presence of Australasian bittern in at least three out of every five years.</p> <p>Presence of curlew sandpiper in at least one out of every five years.</p>	High

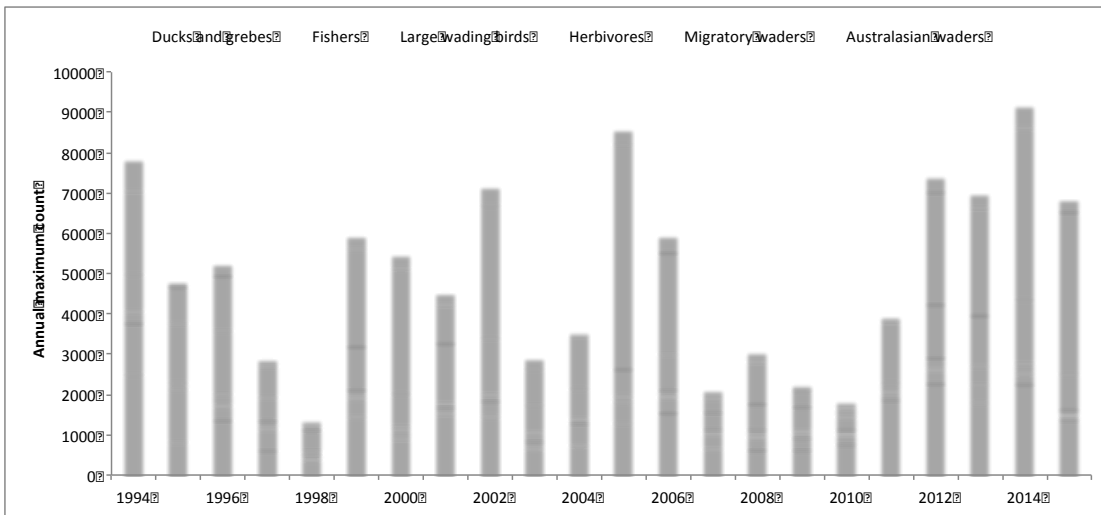


Figure 3. Maximum annual abundance of waterbird guilds at Edithvale-Seaford Wetlands 1994 to 2015 (data from BirdLife Australia). Guild membership as defined by Kingsford et al. (2012).



Figure 4. Habitat zones in the Edithvale Wetlands (redrawn from Quinn et al. 2016).

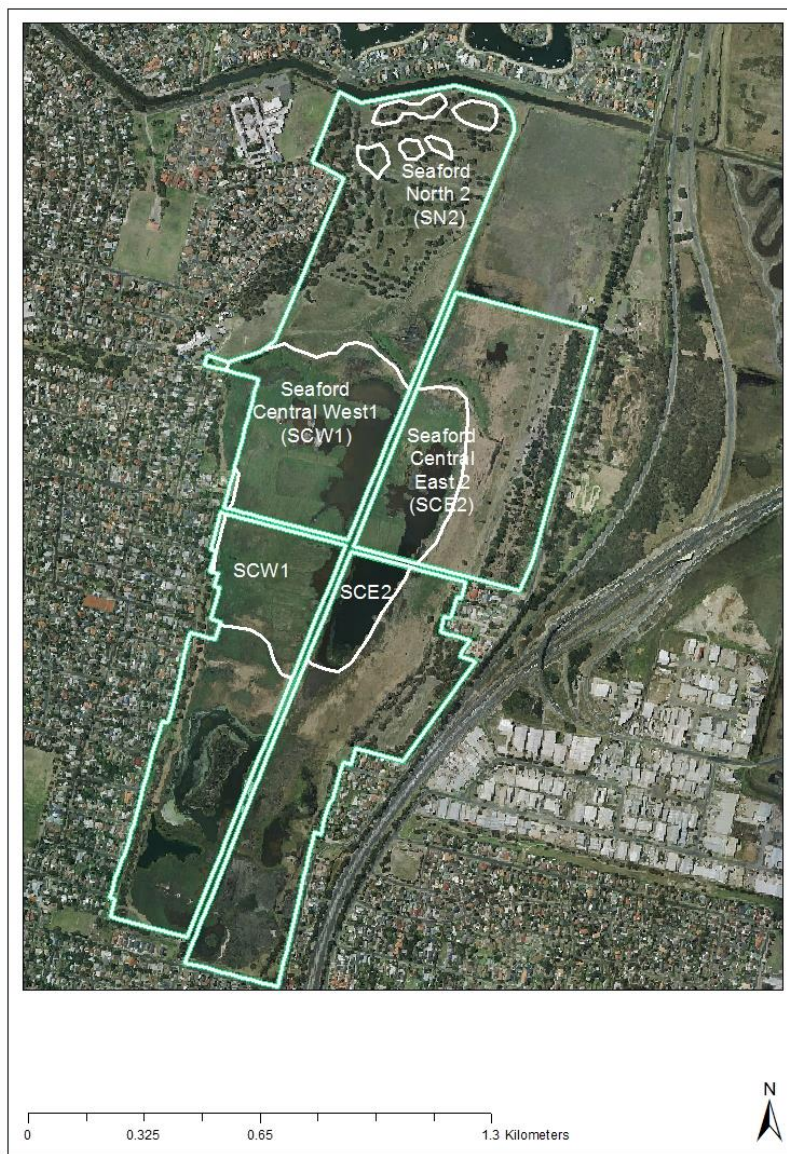


Figure 5. Habitat zones in the Seaford Wetlands (redrawn from Quinn et al. 2016).

5. Threats to ecological character

The management plan for the Edithvale-Seaford Ramsar site was renewed in 2016 (Quinn et al. 2016). A risk assessment was conducted as part of the development of the plan and identified the following high priority threats (Quinn et al. 2016). They are described in further detail in Quinn et al. (2016).

- Urban stormwater contributing to increased salinity.
- Invasive species: common reed (*Phragmites australis*) and cumbungi (*Typha* spp.).
- Invasive species: foxes, cats and rats.
- Climate change: increased frequency and intensity of fire.
- Climate change: sea level rise.
- Climate change: increased frequency and intensity of storms.



Typha spp. At the Edithvale Wetland. Photo: Yvette Baker.

6. Changes since listing

The results of a 2016 assessment of the status of the critical CPS against LAC is set out in Table 4. This assessment indicates that all LAC are met.

Table 4. Summary of assessment against LAC for the Edithvale-Seafood Wetlands Ramsar Site.

Critical CPS	Limit of Acceptable Change	2016 Assessment
Waterbird diversity and abundance	Abundance of waterbirds will not decline below the following (calculated as a rolling five-year average of maximum annual count): Total waterbirds – 2500 Migratory waders – 900 Australasian waders - 125 Ducks - 650 Fishers - 200 Large wading birds - 100 Herbivores – 450	Abundance of waterbirds (2011 – 2015) from Edithvale-Seafood wetlands was as follows (BirdLife Australia unpublished data): Total waterbirds – 7250 Migratory waders – 2700 Australasian waders - 300 Ducks - 1960 Fishers - 280 Large wading birds - 275 Herbivores – 1300 LAC is met.
	Abundance of sharp-tailed sandpiper will not decline below 0.5% of the population as stated in the most recent Wetlands International population estimate (based on a five-year rolling average of annual maximum counts).	Abundance of sharp-tailed sandpipers (2011 – 2015) from Edithvale-Seafood wetlands was 3300 (BirdLife Australia unpublished data). This represents 1.8% of the Wetlands International population estimate ² . LAC is met.
Waterbird breeding	Breeding of the following species at least once every five years: Black swan Blue-billed duck Chestnut teal Dusky moorhen Purple swamphen Swamp harrier	All species were recorded breeding more than once in the past five years (2011- 2015) (Silcocks et al. 2006, Silcocks and O'Connor 2009, 2010, 2011, Silcocks 2012, 2013). LAC is met.
Physical habitat for waterbirds	Wetland habitat that comprises open water, emergent native vegetation (sedges, rushes and reeds) and exposed mudflats.	The extent of tall marsh dominated by common reed (<i>Phragmites australis</i>) has increased at the Ramsar site over the past two decades from 34 hectares in 1994 to 57 hectares in 2013 (Melbourne Water unpublished data). However, this does not dominate the wetland area and a mosaic of open water (deep and shallow) exposed mudflats and emergent vegetation is maintained. LAC is met.
Threatened species: birds	Presence of Australasian bittern in at least three out of every five years. Presence of curlew sandpiper in at least one out of every five years.	Data from BirdLife Australia (2011 – 2015) indicate: Australasian bittern = four out of the past five years. Curlew sandpiper = four out of the past five years. LAC is met.

² This represents 3.9% of the 2016 population estimate of Hansen et al. (2016).

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