

Information Sheet on EAA Flyway Network Sites (SIS) – 2017 version

Available for download from <http://www.eaaflyway.net/about/the-flyway/flyway-site-network/>

Categories approved by Second Meeting of the Partners of the East Asian-Australasian Flyway Partnership in Beijing, China 13-14 November 2007 - Report (Minutes) Agenda Item 3.13

Notes for compilers:

1. The management body intending to nominate a site for inclusion in the East Asian - Australasian Flyway Site Network is requested to complete a Site Information Sheet. The Site Information Sheet will provide the basic information of the site and detail how the site meets the criteria for inclusion in the Flyway Site Network. When there is a new nomination or an SIS update, the following sections with an asterisk (*), from Questions 1-14 and Question 30, must be filled or updated at least so that it can justify the international importance of the habitat for migratory waterbirds.
2. The Site Information Sheet is based on the Ramsar Information Sheet. If the site proposed for the Flyway Site Network is an existing Ramsar site then the documentation process can be simplified.
3. Once completed, the Site Information Sheet (and accompanying map(s)) should be submitted to the Flyway Partnership Secretariat. Compilers should provide an electronic (MS Word) copy of the Information Sheet and, where possible, digital versions (e.g. shapefile) of all maps.

1. Name and contact details of the compiler of this form*:

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EAAF SITE CODE FOR OFFICE USE ONLY:

Institution/agency: Department of Sustainability,
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2. Date this sheet was completed*:

DD/MM/YYYY

18/01/2013

3. Country*:

Australia

4. Name of the Flyway Network site*:

Accepted English transcription of the Site's name.

Eighty-Mile Beach, Western Australia

5. Map of site*:

The most up-to-date available and suitable map of the wetland should be appended to the SIS (only in digital format and shape file). The map must clearly show the boundary of the site. Please refer to the "Digitising Site Boundaries in Google Earth" file linked [here](#).



6. Geographical coordinates (latitude/longitude, in decimal degrees)*:

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

Latitude: (approx.) 19°02' S to 20°00' S; Longitude: (approx.) 119°48' E to 121°32' E

7. Elevation*: (in metres: average and/or maximum & minimum)

Sea level to 50 m (Australian Height Datum)

8. Area*:

The total area of the site, in hectares. If the areas of discrete site units are known, please also list each of these together with the names (or labels) used to identify and differentiate these units.

175,487 ha

9. General overview of the site*:

A brief (two sentences) summary of the site, mentioning principal physical and ecological functions, and its importance for migratory waterbirds.

The site consists of a 220km section of coastline and adjacent mudflats, together with two large ephemeral lakes and a series of springs occurring in marshland to the east. More than 472,000 migratory shorebirds have been counted on the mudflats during the September to November period. The site is one of the three most important for migratory shorebirds in Australia. It is considered to be one of the major stopover and non-breeding areas for migratory shorebirds visiting Australia. The springs in the hinterland are on an old palaeo-river and palaeo-estuary system and support unusual vegetation.

10. Justification of Flyway Site Network criteria*:

Please provide waterbird count information (with year of latest count) that demonstrates that the site meets the criteria of the Flyway Site Network (Annex 1). That is:

- it regularly supports > 20 000 migratory waterbirds; or,
- it regularly supports > 1 % of the individuals in a population of one species or subspecies of migratory waterbird; or,
- it supports appreciable numbers of an endangered or vulnerable population of migratory waterbird
- it is a “staging site” supporting > 5 000 waterbirds, or > 0.25% of a population stage at the site.

A listing of the populations of migratory waterbirds covered by the East Asian – Australasian Flyway Partnership and the 1% thresholds is attached (Annex 3).

The “staging site” criterion is particularly difficult to apply and application of this should be discussed with the Secretariat. Also note that some species have several populations that are very difficult to distinguish in the field.

Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.

In terms of numbers counted, Eighty-mile Beach is the most important in Australia for use by migrant shorebirds, particularly on southward migration (August-November); it is therefore also important in the context of the East Asian - Australasian Flyway. Major arrivals of Sharp-tailed Sandpiper *Calidris acuminata* have been observed; thousands were resting in tight-packed flocks on the beach in September 1982 and 25 000 arrived overnight in mid-September 1984.

Over 336,000 shorebirds were counted at Eighty-mile Beach in November 1982, while 472,000 were present in November 2001 and 465,000 were counted in October 1998; this number of shorebirds has not been exceeded elsewhere in Australia and these are some of the highest counts for the East Asian – Australasian Flyway. Over 291,000 shorebirds were counted during the summer of 2009-2010 (Shorebirds 2020 database).

A complete census of Eighty-mile Beach undertaken during the Boreal summer breeding season (July 2003) recorded a total of 41 500 shorebirds and another 4 300 gulls and terns. The highest number of waterbirds counted on the plain/swamps was 75 000 in September 1982 (Jaensch 1989); up to 10 000 ducks (mainly Hardhead *Aythya australis*) and 45 000 shorebirds (mainly Oriental Pratincole *Glareola maldivarum*, Oriental Plover *Charadrius asiaticus* and Little Curlew *Numenius minutus*) use the plain/swamps. Sharp-tailed Sandpiper *Calidris acuminata* also use the plains but numbers have declined in recent years

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.

Eighty-mile Beach is one of the most important non-breeding and migratory stop-over areas for shorebirds in the East Asian – Australasian Flyway, regularly supporting in excess of 300-400,000 birds (Bamford et al. 2008; Australasian Wader Study Group – AWSG, unpublished data from expeditions in October 1998 and November 2001). It is one of the most important sites in the world for the migration of Great Knot and it supports at least 1% of the flyway population (or 1% of the national population for resident species) of 18 shorebird species (17 shorebirds and 1 tern, comprising 15 migratory and 3 resident species).

Highest counts for these species are:

Species	Highest Count	EAAF 1% threshold	Source
Greater Sand Plover <i>Charadrius leschenaultii</i>	64, 584	1,000	Rogers et al. 2011
Oriental Plover <i>C. veredus</i>	144,300	700	Rogers et al. 2011
Red-capped Plover <i>C. ruficapillus</i> (resident)	15,200	950	Bamford et. al. 2008
Grey Plover <i>Pluvialis squatarola</i>	1,585	1,250	Rogers et al. 2011
Bar-tailed Godwit <i>Limosa lapponica</i>	110,290	1,700	Bamford et. al. 2008
Red Knot <i>Calidris canutus</i>	80,700	2,200	Bamford et. al. 2008
Great Knot <i>C. tenuirostris</i>	169,044	3,800	Rogers et al. 2011
Red-necked Stint <i>C. ruficollis</i>	60,000	3,150	Bamford et. al. 2008
Sanderling	3,605	220	Rogers et al. 2011

Information Sheet on EAA Flyway Network Sites

<i>C. alba</i>			
Sharp-tailed Sandpiper <i>C. acuminata</i>	25,000	1,600	Bamford et. al. 2008
Curlew Sandpiper <i>C. ferruginea</i>	60,000	1,800	Bamford et. al. 2008
Eastern Curlew <i>Numenius madagascariensis</i>	709	380	Bamford et. al. 2008
Common Greenshank <i>Tringa nebularia</i>	2,534	1,000	Rogers et al. 2011
Grey-tailed Tattler <i>T. brevipes</i>	14,647	400	Rogers et al. 2011
Terek Sandpiper <i>Xenus cinereus</i>	9,820	500	Rogers et al. 2011
Ruddy Turnstone <i>Arenaria interpres</i>	3,480	350	Bamford et. al. 2008
Oriental Praticole	2,880,000	20,000	Bamford et. al. 2008
Pied Oystercatcher <i>Haematopus longirostris</i> (resident)	809	100	Rogers et al. 2011
Caspian Tern <i>Hydropogone caspia</i>	177	100	AWSG July 2003, unpub data

Twelve migratory shorebird species were recorded in numbers above the 1% criterion level during the summer of 2009/10; 47,973 Bar-tailed Godwit *Limosa lapponica*, 2,269 Common Greenshank *Tringa nebularia*, 3,763 Terek Sandpiper *Xenus cinereus*, 6,818 Grey-tailed Tattler *Tringa brevipes*, 2,161 Ruddy Turnstone *Arenaria interpres*, 123,561 Great Knot *Calidris tenuirostris*, 23,109 Red Knot *Calidris canutus*, 3,329 Sanderling, 27,302 Red-necked Stint *Calidris ruficollis*, 2,821 Curlew Sandpiper *Calidris ferruginea*, 21,093 Greater Sand Plover *Charadrius leschenaultii*, and 17,296 Oriental Plover *Charadrius veredus* (Shorebirds 2020 database).

11. Wetland Types*:

List the wetland types present (see Annex 2). List the wetland types in order of their area in the Flyway Network site, starting with the wetland type with the largest area.

- E Sand, shingle or pebble shores;** includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks
- G Intertidal mud, sand or salt flats.**
- I Intertidal forested wetlands;** includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.
- R Seasonal/intermittent saline/brackish/alkaline lakes and flats.**
- Sp Permanent saline/brackish/alkaline marshes/pools.**
- U Non-forested peatlands;** includes shrub or open bogs, swamps, fens.

- Xf** **Freshwater, tree-dominated wetlands;** includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.
- Y** **Freshwater springs; oases.**

12. Jurisdiction*:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Ministry of Agriculture/Dept. of Environment, etc.

Territorial: Government of Western Australia

Functional: Department of Environment and Conservation

13. Management authority*:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland and the title and/or name and email address/phone number of the person or persons in this office with direct responsibility for managing the wetland.

Several State Government Agencies are involved in management of the site. The key agency is the Department of Environment and Conservation, because of the Ramsar listing of the site.

The contact details for the management office are:

Department of Environment and Conservation

PO Box 65

Broome WESTERN AUSTRALIA, 6725

14. Bibliographical references*:

A list of key technical references relevant to the wetland, including management plans, major scientific reports, and bibliographies, if such exist. Please list Web site addresses dedicated to the site or which prominently feature the site, and include the date that the Web site was most recently updated. When a large body of published material is available about the site, only the most important references need be cited, with priority being given to recent literature containing extensive bibliographies.

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(From the Ramsar Information Sheet (RIS) for Eighty-mile Beach)

15. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Eighty-mile Beach is a megascale (220 km) linear sand-coast; the beach is 100 m wide and includes several muddy, microscale irregular embayments. Adjoining tidal mudflats vary from 1.1 to 5 km in width (G. Pearson, pers. comm.). The maximum width of tidal flat was recorded at 3.8 km on low water spring tides in 1999, but probably exceeds 5 km (D. Rogers, pers. comm.). The site also includes a megascale (c. 100 km long), discontinuous linear floodplain immediately inland of the frontal sand dunes; in places (notably north-east of Anna Plains Homestead) it includes distinct sumplands. Situated in the Canning Basin; the dunes are in part white

calcareous sand, in part oolitic coastal aeolianite and at other locations quartzose calcarenite or fine to coarse calcilutite. Cross-bedded fossiliferous beach ridges also occur. The mudflats are of soft alkaline marine sediment <63 µm silt and mud (G. Pearson, pers. comm.). Low, slightly undulating "pindan" country lies immediately inland of the plain.

Mandora Salt Marsh has formed over thousands of years upon what was the lower reaches and mouth of a palaeo-river and palaeo-estuary system (Graham 1999). The predominant features are two large lakes which are inundated following heavy cyclonic rains. The western lake (Walyarta) is a claypan that starts close to the Great Northern Highway and extends east approximately 30 km. It is up to 5 km wide and during flooding, the water depth never exceeds 2 m (Graham 1999). The eastern lake, separated from Walyarta by a calcrete ridge, is a broad, braided drainage line with islands of vegetation and small salt/clay pans (Graham 1999). It is extensive when flooded but rapidly becomes a series of isolated salt/clay pans as it dries out (Graham 1999). Running between Walyarta and the eastern lake is Salt Creek, an old watercourse lined with mangroves *Avicenna marina* that is about 20 m wide and 5 km long. Salt Creek is permanently inundated and it appears to be fed by a series of soaks (Graham 1999). It is possibly connected to the sea by an aquifer.

Mandora Salt Marsh includes a number of permanent or almost permanent fresh-water swamps supplied by springs which are located along the southern side of the two main lakes. Typically, the mound springs consist of a central, raised (2-3 m elevation) mound of saturated peat, supporting a mixture of *Melaleuca* and *Sesbania* trees with mangroves *Avicenna marina* appearing on the brackish-saline springs (Graham 1999). The springs vary in size from 0.1 ha to several hectares. Generally, the mound is encircled by an inundated moat, varying from a depth of approximately 50 cm to isolated shallow pools or even damp ground. Many of the springs also support small stands of Cumbungi *Typha domingensis* and the understorey of some springs is dominated by the fern *Achrostichum speciosum*. The most spectacular of the springs is Mandora Soak, one of the Eil Eil complex, which is a classical raised peat bog.

On both the northern and southern sides of Mandora Salt Marsh are stands and thickets of Saltwater Paperbark *Melaleuca acacioides* which remain inundated for longer into the dry season than other areas (Graham 1999). Several stock watering bores have been established in these thickets and troughs holding water are used by waterbirds throughout the year.

The climate is semi-arid monsoonal with a hot wet summer and a warm dry winter. Median and mean annual rainfall at Mandora is 327 mm and 341 mm respectively (varies from Cape to Cape by c. 100 mm). Annual evaporation is c. 3400-3600 mm. It is important to note that there is a high degree of variability in rainfall events with significant variations in rainfall between years as well as the period when the bulk of the rain falls (Graham 1999).

Cyclones, especially in the months January to March, contribute much of the rainfall, and have sometimes resulted in heavy stock losses. The churning effect of cyclone-generated waves in December 1995 during Cyclone 'Gertie' killed large numbers of bivalves, temporarily increasing food abundance for Bar-tailed Godwit, Great Knot and Red Knot (Jessop and Collins 2000). Every year from 1995 to 1999 a cyclone has crossed the site or passed over very nearby (Graham 1999).

16. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

There is evidence that in the Great Sandy Desert some 30 km inland of Eighty-mile Beach, aeolian sand ridges were truncated and remoulded into chevron ridges by a massive palaeo-tsunami (tidal wave) which deposited marine shells and lateritic gravels in these dunes and stacked large lateritic boulders at the front of the dunes (Bryant 2001). Dating of shell deposits indicates that the tsunami occurred around A.D.1080.

17. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

The major hydrological values of the nominated area occur in Mandora Salt Marsh, where the Eil Eil Springs, Grant Spring and Salt Creek are discharge sites for groundwater. They are located in a palaeoriver channel.

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Flyway Network site, and the ecosystem services of the site and the benefits derived from them.

Eighty-mile Beach is one of the most important non-breeding and migratory stop-over areas for shorebirds in the East Asian – Australasian Flyway, regularly supporting in excess of 300,000 - 400,000 birds (Bamford et al. 2008). It is one of the most important sites in the world for the migration of Great Knot and it supports at least 1% of the flyway population (or 1% of the national population for resident species) of 18 shorebird species (17 shorebirds and 1 tern, comprising 15 migratory and 3 resident species).

The principal conservation value of the area is the presence of so many shorebirds. However, Mandora Salt Marsh is part of a palaeo-drainage system extending from the eastern Kimberley, through Lake Gregory, to Eighty-mile Beach. The peat deposit in Mandora Soak is estimated to be about 7 000 years old. The springs support interesting and unusual plant assemblages and the lake to the east of Salt Creek contains the most inland mangroves (52 km from the coast) in Western Australia.

The dominant flora on the coastal sand-dunes are *Triodia epactia*, *Crotalaria cunninghamii* and *Spinifex longifolius*. The most common species of mangrove is *Avicennia marina*. Mandora Soak supports *Melaleuca leucadendra*, *M. acacioides*, *Sesbania formosa*, sedges, bullrushes and ferns. The marshy areas contain samphire vegetation and *Sporobolus virginicus* grassland.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the SIS.*

(Please add here the species which do not come under sec no 14)

At Eighty-mile Beach, primary beach dunes are stabilised by *Spinifex longifolius* and *Crotalaria cunninghamii* (Burbidge 1944, Craig 1983). Secondary parallel, calcareous dune ridges and swales commonly feature scattered Dune Wattle *Acacia bivenosa* (McKenzie 1985). Important grasses include *Whiteochloa airoides* and the local endemic *Triodia epactia*, a resinous hummock-forming species (Jacobs 1992). There are two minor mangrove stands, both occupying about 50 ha in small tidal creeks near Mandora Station. The stands are dominated by *Avicennia marina* to 4-6 m height with a few *Ceriops tagal*. Samphire communities also occur in the vicinity (Johnstone 1990).

Inland grasslands have been extensively modified by intensive grazing and are dominated by introduced Buffel Grass *Cenchrus ciliaris* and Birdwood Grass *Cenchrus setiger*. Saline grasslands feature Saltwater Couch *Sporobolus virginicus*, often fringed by thickets of Salt Wattle *Acacia ampliceps* and Paperbark, typically *Melaleuca acacioides*. Low open woodland with Poverty Bush *Acacia translucens* and scattered *Bauhinia cunninghamii* trees occurs on reddish pindan sandy soils inland (T. Willing, pers. comm.).

Mandora Salt Marsh

To date, a total of 269 species of vascular plants, from 55 families, have been collected from the Mandora Salt Marsh. This includes 37 species from the family Poaceae, and 9 introduced weeds. The most inland occurrences of mangroves in Western Australia, Grey Mangrove *Avicennia marina*, occur east of the Sandfire Roadhouse (Beard 1967). The stands commence from an

island in Walyarta (30 km inland) and occur along the length of Salt Creek, terminating with an isolated stand about 52 km inland of Eighty-mile Beach (T. Willing, pers. comm.). A new, calcrete-associated thorny Bush Tomato (*Solanum oligandrum*) known only from the Mandora marsh area was first described in 2001 (Symon 2001).

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 10. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the SIS.*

(Please add here the species which do not come under sec no 14)

Eighty-mile Beach

Threatened Species: Little Tern *Sterna albifrons* occur, mainly the Asian migrant race, but no breeding of the threatened Australian population has yet been recorded for Eighty-mile Beach (D. Rogers, pers. comm.).

Species Composition: 65 bird species have been recorded from Eighty-mile Beach and Anna Plains (Beach c. 40 spp.; plain c. 37); 33 are listed under treaties (Japan – Australia Migratory Bird Agreement, the China – Australia Migratory Bird Agreement and Republic of Korea – Australia Migratory Bird Agreement) and are specially protected by the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)*. The 65 include nine herons and allies, 31 shorebirds and seven terns. The beach regularly supports a few individuals of Asian Dowitcher *Limnodromus semipalmatus*. The Australasian Wader Studies Group (AWSG) has caught Swinhoe's Snipe *Gallinago megala*. Pin-tailed Snipe *G. stenura*, are probably present and Long-toed Stint *Calidris subminuta* occur at the coastal plain swamps. Vagrants such as Ruff *Philomachus pugnax* and Spotted Redshank *Tringa erythropus* (on the northern Beach) have been recorded (D. Rogers, pers. comm.).

Flatback Turtle *Natator depressus* regularly nest at scattered locations along Eighty-mile Beach, between October and April (R. Prince, pers. comm.). Flatback Turtles are listed as a vulnerable species under the Commonwealth *Environment Protection and Biodiversity Conservation Act (1999)*.

Coastal plains in the southern portion of Anna Plains Station are a stronghold for Australian Bustard *Ardeotis australis* and support high densities of Red Kangaroo *Macropus rufus* (T. Willing, pers. comm.). The western part of Walla Station is notable for dense populations of Euro *Macropus robustus* (T. Willing, pers. comm.).

In terms of numbers counted, Eighty-mile Beach is the most important in Australia for use by migrant shorebirds, particularly on southward migration (August-November); it is therefore also important in the context of the East Asian - Australasian Flyway. Major arrivals of Sharp-tailed Sandpiper *Calidris acuminata* have been observed; thousands were resting in tight-packed flocks on the beach in September 1982 and 25 000 arrived overnight in mid-September 1984.

Shorebird Banding: Banding NW Australian shorebirds with a yellow plastic leg flag, attached to the right tibia, commenced in August 1992. This has greatly facilitated rapid visual recognition of birds banded in NW Australia at key stop-over sites and furnished valuable information in delineating migration routes, with over 36 000 shorebirds flagged (Minton and Jessop 1999.) Lists of sightings away from flagging locations, including Russia, Korea and China, have been published at almost annual intervals in the journal *Stilt*.

Shorebird Roosting: High tide roosts in the order of 10 000 shorebirds occur at intervals along the Beach, with highest number of flocks per km in the north (Anna Plains) sector. During the non-breeding season, the highest numbers of shorebirds occur in a relatively short stretch of the Beach 5 to 30 km south of the access point near Anna Plains Homestead (D. Rogers, pers. comm.) The richest pearling grounds lie west of the same stretch of shoreline (G. Pearson, pers. comm.). Numbers of birds roosting on different parts of the Beach at high tide showed a broad correspondence with density of birds feeding on adjacent flats at low tide. This correspondence is somewhat obscured on big tides, because birds fly along the Beach to roost at sites where the Beach is broadest (D. Rogers, pers. comm.). In winter 2003, during the first-ever complete ground census of Eighty-mile Beach, the distribution of shorebirds was considerably different than generally occurs during the summer non-breeding season, with significantly more shorebirds occupying the southern beaches than in summer (AWSG, July 2003, unpub data).

Shorebird Numbers: The highest number of shorebirds counted on the Beach was 472 000 in November 2001; this number of shorebirds has not been exceeded elsewhere in Australia and is one of the highest counts in the Flyway. Due to onwards passage of birds through austral spring, the total number of shorebirds using the site each year may be much higher. A complete census of Eighty-mile Beach undertaken during the Boreal summer breeding season (July 2003) recorded a total of 41 500 shorebirds and another 4 300 gulls and terns (Minton et al. in press). The highest number of waterbirds counted on the plain/swamps was 75 000 in September 1982 (Jaensch 1989); up to 10 000 ducks (mainly Hardhead *Aythya australis*) and 45 000 shorebirds (mainly Oriental Pratincole *Glareola maldivarum*, Oriental Plover *Charadrius asiaticus* and Little Curlew *Numenius minutus*) use the plain/swamps.

The most abundant species at Eighty-mile Beach are Great Knot *Calidris tenuirostris* (up to 169 000), Bar-tailed Godwit *Limosa lapponica* (110 300), and Red Knot *Calidris canutus* (80 700,

though subsequent counts have been much lower - D. Rogers, pers. comm.). Other notable species include: Curlew Sandpiper *Calidris ferruginea* (60 000), Red-necked Stint *Calidris ruficollis* (60 000), Large Sand Plover *Charadrius leschenaultii* (64 584) and Oriental Plover *Charadrius veredus* (144,300) at the Beach, Sharp-tailed Sandpiper *Calidris acuminata* (25 000) at both Beach and swamps, and Little Curlew (14,200) at the plain. The site has the highest or second highest counts in Australia for each of these species except Little Curlew (national rank 3). It supports at least 1% of the flyway population (or Australian population in the case of resident species) of the nine above-mentioned species as well as the following: Grey Plover *Pluvialis squatarola* (1 650), Ruddy Turnstone *Arenaria interpres* (3 480), Eastern Curlew *Numenius madagascariensis* (709), Grey-tailed Tattler *Tringa brevipes* (14 647), Terek Sandpiper *T. terek* (9 820), Greenshank *T. nebularia* (2 534), Sanderling *Calidris alba* (3 220), Red-capped Plover *Charadrius ruficapillus* (15 200), Pied Oystercatcher *Haematopus longirostris* (620) and Caspian Tern *Sterna caspia* (180). Species also present include: Lesser Golden Plover *P. fulva*, Black-winged Stilt *Himantopus himantopus*, Marsh Sandpiper *T. stagnatilis*, and Whimbrel *N. phaeopus*. Surveys during the Boreal summer breeding season (July 2003) recorded nine species (6 migratory and 3 resident species) in numbers greater than 1% of the flyway population (or the Australian population for resident species): Pied Oystercatcher (620), Large Sand Plover (3 600), Red-capped Plover (2 950), Bar-tailed Godwit (13 750), Red Knot (2 300), Great Knot (10 650), Red-necked Stint (5 100), Sanderling (220) and Caspian Tern (180). (RAOU/WADCALM ground/aerial surveys 1981-92; Blakers et al. 1984; Jessop 1985; Lane 1987; Lane & Jaensch 1989; WADCALM 1990, Minton, et al. in press, D. Price pers. comm.)

Benthic Fauna: The ANNABIM-99 project (October 1999) brought together volunteers through Environs Kimberley and researchers from the Department of Conservation and Land Management, Netherlands Institute for Sea Research (NIOZ), and the Universities of Charles Sturt, Curtin and Sydney. 900 sample stations were visited along 80 km of the Mandora/Cape Missiessy sector of Eighty-mile Beach. 18,600 invertebrates were collected, representing about 114 taxa. Fewer habitat types occur, in comparison to Roebuck Bay. There was broad correspondence between shorebird abundance and their benthic prey. Bivalves were in unusually high densities – up to 8000/sq. m for *Siliqua* cf *winteriana* and *Donax*. Crabs were of reduced importance in the Wallal sector of the Beach. An interesting species of reef-forming tubeworm (Sabellariidae) was collected and a number of macro-invertebrate collections may be new to science (Piersma et al.1999).

Detailed results of the ANNABIM-99 project are forthcoming (Pearson et al. 2002).

Mandora Salt Marsh

Waterbirds: A total of 55 species of waterbirds, including 19 shorebirds, 7 ducks, 2 grebes, 4 darters and cormorants, 6 herons and egrets, 7 rails and crakes, and 4 gulls and terns (Graham

1999). Of these, at least 13 species have been recorded breeding in the Marsh. Particularly common species include: Black-winged Stilt *Himantopus himantopus* (more than 10 000 in June 1997); Whiskered Tern *Chlidonias hybridus* (3 000 observed to be opportunistically feeding on Spangled Perch being washed over the Great Northern Highway during flooding in 1999); Grey Teal *Anas gracilis* (420 at Coolabah Claypan and 400-500 at Walyarta in October 1999); White-necked Heron *Ardea pacifica* (200 in October 1999); Great Egret *A. alba* (1200 at Walyarta in October 1999); and Australian Pelicans *Pelecanus conspicillatus* (4950 in May 1999 and 7000 in October 1999) (Graham 1999). Mandora Marsh is an important breeding area for Pelicans and they bred in huge colonies after flooding in 1999; eggs were first laid in the first week of April 1999 and the last hatching dates were in mid September 1999, indicating that four breeding cycles may have occurred on Walyarta during 1999 (Graham 1999). Large numbers of Black Swan *Cygnus atratus* (700) including eggs and cygnets were also observed at Walyarta in May and October 1999 (Graham 1999).

Fish: A new, apparently endemic goby has been discovered in Salt Creek (T. Willing, pers comm.). Following extensive flooding in 1999, Spangled Perch *Madigania unicolour* were widespread in Walyarta (Graham 1999).

Mammals: The vulnerable Bilby *Macrotis lagotis*, which is specially protected by the Commonwealth *Environment Protection and Biodiversity Conservation Act* (1999), has been recorded in sandy sites within the Mandora Salt Marsh. A total of 22 mammals, including 4 dasyurids, 2 macropods, 4 native mice, 3 native bats, and 6 feral species have been recorded using the Marsh. At least 49 reptiles and 6 amphibians also occur at the Marsh (Graham 1999).

21. Social, economic and cultural values:

a) Describe if the site has any general social, economic and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

The southern sector of Eighty-mile Beach is regarded by Aboriginal people as being part of Nyangumarta country, while the northern area (Anna Plains Station) is regarded as Karajarri country. In the Karajarri language, the Eighty-mile Beach is named *Wender*, meaning “a creaking noise”, apparently in reference to the sound of walking through its dry sand (Worms 1944). Many of the Aboriginal people with connections to the area now reside at Bidyadanga Community (formerly La Grange Mission) and nearby at Frazier Downs. A number of soaks, known as *lirri*, are located immediately inland of the Eighty-mile Beach and were important for the provision of drinking water (Yu 2000). Many soaks became Water Reserves on the Kimberley-De Grey Stock Route, used until the 1960s for long distance cattle-droving (Watkins et al. 1997).

The Talgarno military base, immediately east of Anna Plains homestead, was significant in the post-Second World War period for the monitoring and recovery of British Blue Streak rockets, test-fired from Woomera in South Australia. A large gravel airstrip, artesian bores and a few concrete blockhouses remain (Watkins et al. 1997). In 1999 the Department of Defence test-fired a missile from a site on Anna Plains, in connection with the development of the Jindalee over-the-horizon radar project (Willing, pers. comm.).

Eighty-mile Beach is Interim Listed on the Register of the National Estate (Commonwealth of Australia Gazette No. P 25, dated 21 November 2000).

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? (Double-click the checkbox to check and choose "Checked" under "Default Value" from "Check Box Form Field Options" window)

If yes, tick the box and describe this importance under one or more of the following categories:

- I. Sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- II. Sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- III. Sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- IV. Sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

22. Land tenure/ownership:

a) Within the Flyway Network site:

The Government of Western Australia has control over marine areas of the site. Native Title Claims by Karrajarrri and Nyangumarta Aboriginal groups await resolution. The western (Eighty-mile Beach) part of the nominated area extends only 40 metres above high-tide mark and is mainly Unallocated Crown Land.

b) In the surrounding area:

Four large pastoral leases (Anna Plains, Mandora, Wallal and Pardoo) adjoin Eighty-mile Beach. The leases commence 40m above high tide mark and are used for rangeland grazing (Watkins *et al.* 1997). Exploration permits are held over some of the area.

23. Current land (including water) use:

a) Within the Flyway Network site:

Localised beach-based recreation occurs on Eighty-mile Beach and Caravan Park has been established on Wallal Downs, just behind the dunes. Another is proposed at Cape Keraudren. Cattle grazing occurs on the Mandora Salt Marsh. There is seasonal commercial net fishing (licensees at Anna Plains, Mandora and Wallal) and offshore pearling. Shallow waters west (seaward) of Eighty-mile Beach constitute the major pearling grounds for sourcing wild live shell for the Broome-based cultured pearl industry, focused on *Pinctada maxima* (Watkins et al. 1997). The Western Australian Department of Fisheries enforces strict commercial quotas for live shell, to ensure sustainable harvest of the resource. Petroleum exploration permits are held over the area.

b) In the surroundings/catchment:

There is intensive grazing of cattle on the coastal plain with a low human population, resident at station homesteads and two roadhouses (Pardoo and Sandfire) on the Great Northern Highway. Limited tourism also occurs.

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

a) Within the Flyway Network site:

Cattle grazing has probably had little or no detrimental effect on the samphire areas of Mandora Salt Marsh with respect to waterbird usage but has caused substantial deterioration in the vegetation and physical environment of the springs and Salt Creek. An investigation of ways of reducing the impact of grazing in these areas, especially around Mandora Soak, is desirable. High numbers of feral cats and camels are present in the Mandora Salt Marsh.

Exploration for petroleum may occur in future and, provided it is subject to environmental safeguards to maintain the ecological character of the wetland and habitat for the waterbirds using it, will be compatible with status as a Wetland of International Importance.

Limited visitor access to the southern end of Eighty-mile Beach is of no major concern, but vehicles should normally be excluded from the section of beach near Anna Plains Homestead, because of shorebird concentrations there. Heavy usage of 4WD vehicles

on the Beach is also thought likely to have a detrimental impact on beach crab populations, especially Ghost Crabs *Ocypode* spp. (Watkins et al. 1997).

Foxes are believed to be having an adverse impact on roosting shorebirds and Flatback Turtle nesting sites (Willing, pers. obs.).

b) In the surrounding area:

The possibility of a major offshore oil spill poses a potential threat. Local overgrazing, including degradation of coastal plain vegetation (especially at swamps) may occur during drought periods. Numerous cleared survey lines are visible on the coastal plain.

25. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Flyway Network site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

In mid 2012, the Australian Government proposed the 'Eighty Mile Beach Commonwealth Marine Reserve' (Multiple Use Zone – IUCN Category VI - 10,785 km²). This reserve aims to protect foraging areas adjacent to important breeding areas for migratory shorebirds and seabirds. The reserve was proclaimed in late 2012.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate, see Annex 3):

Ia ; Ib ; II ; III ; IV ; V ; VI ; N/A

c) Does an officially approved management plan exist; and is it being implemented?:

If yes, is it being implemented?: If no, is one being planned?

d) Describe any other current management practices:

Some 30 km of fencing has been erected on Anna Plains pastoral lease to exclude cattle from part of Eighty-Mile Beach and the dune systems (funded by the Commonwealth Coastcare program in 2001). Additional exclusion fencing is being considered (Pearson, pers. comm.).

In 1997, Saunders Spring in Mandora Salt Marsh was fenced to exclude cattle from all but one watering point using funding from the Commonwealth Natural Heritage Trust program. Funding was also obtained to fence Grants Spring, which was completed in 2001.

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

The Department of Environment and Conservation is currently undertaking negotiations with surrounding pastoral leaseholders to add significant terrestrial areas adjacent to the site to the conservation estate.

The managers of Eighty-mile Beach Caravan Park have called for motor bikes to be banned from the Beach between November and April, to minimise impacts on turtle nesting and shorebirds (Watson 1996).

In 1994, The Department of Environment and Conservation published a report titled *A Representative Marine Reserve System for Western Australia*, prepared by the Marine Parks and Reserves Selection Working Group (DCLM 1994). In the report, the Working Group recommended that a section of Eighty-mile Beach and adjoining marine waters, including tidal flats and a 40 metre strip of land above high tide, should be reserved for the protection of marine flora and fauna, including migratory shorebirds. The Working Group suggested that the reserve should be in the vicinity of Anna Plains and extend seawards, preferably to the limit of State waters however, the Working Group also recommended that a decision on which section should be reserved should be deferred until the Royal Australasian Ornithologists Union (now Birds Australia) completes its study of the area, enabling the areas of most importance to migratory shorebirds to be included.

27. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Eighty-mile Beach and (to a lesser extent) Anna Plains have been intensively surveyed for shorebirds by the Australasian Wader Studies Group since 1981, mainly through an ongoing program of shorebird banding expeditions. Numerous shorebird recoveries have been reported from China, Korea and Russia. The expeditions usually include foreign participants, notably researchers from Asian countries of the Shorebird Flyway, receiving training in shorebird study techniques.

A community monitoring program of periodic benthic sampling at three sites near Anna Plains is current, involving joint collaboration between Environs Kimberley, the then Department of Conservation and Land Management and the Netherlands Institute for Sea Research (G. Pearson, pers. comm.).

A postgraduate student (S Wade) from Central Washington University, USA, published a paper in 2008 on satellite imagery predictions of beach grain size and benthic invertebrate distributions at Eighty-mile Beach. This information was used to map shorebird feeding areas based on where their favoured feeding areas would be found.

The connection between localised benthic richness at the Beach and a possible nutrient supply, emanating from the gypsum-rich Mandora paleo-catchment area, i.e. the Walyarta/Salt Creek system, warrants further research (T. Willing, pers. comms.).

In 1999, the Department of Environment and Conservation coordinated a detailed study of the ecology of Mandora Salt Marsh, including systematic, quadrat-based recording (presence/absence) of plants, birds, mammals, reptiles, amphibians, aquatic invertebrates and water chemistry, as well as opportunistic sampling of habitats of interest (Graham 1999). The major aim of the survey was to provide an overall resource inventory for the area to assist in the identification of land management issues affecting the area (Graham 1999).

In 2008, Eighty-mile Beach (and Roebuck Bay) were the focus of investigations into the population sizes of migratory shorebirds visiting Australia annually (Rogers et.al. 2008)

At the present time there are no research facilities, however the manager of Anna Plains Station has provided ongoing logistical support to researchers over many years (T. Willing, pers. comm.)

28. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

An educational pamphlet for visitors to Eighty-mile Beach has been jointly produced and colour-printed for Environs Kimberley, Broome Bird Observatory and the Department of Environment and Conservation with funding support from the Gordon Reid Foundation (Lotteries Commission of Western Australia).

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Cape Keraudren, at the southern end of Eighty-mile Beach, has a Recreation Reserve (39135, 4 800 ha), vested in the Shire of East Pilbara. The area is popular for informal camping and fishing and has a Shire-appointed ranger (Chalmers 1986). Eighty-mile Beach Caravan Park is a

commercial caravan park, with powered sites and water, operating on an 11 ha special lease near Wallal. Eighty-mile Beach is famous for its abundance of large baler and other shells and because of this has become a popular shell-collecting area (Watkins et al. 1997). Recreational fishing occurs on Eighty-mile Beach.

30. Threats*:

Which of the following threats is present historically – when the threat stopped but the effects are still there (H), currently (C) or potentially (P)?

	Historically	Currently	Potentially
Residential and commercial development			
housing and urban areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
commercial and industrial areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
tourism and recreation areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Agriculture and aquaculture			
annual and perennial non-timber crops	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
wood and pulp plantations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
livestock farming and ranching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
marine and freshwater aquaculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy production and mining			
oil and gas drilling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
mining and quarrying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
renewable energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation and service corridors			
roads and railroads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
utility and service lines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
shipping lanes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
flight paths	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biological resource use			
hunting and collecting terrestrial animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
gathering terrestrial plants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
logging and wood harvesting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Information Sheet on EAA Flyway Network Sites

fishing and harvesting aquatic resources

Human intrusions and disturbance

recreational activities

war, civil unrest and military exercises

work and other activities

Natural system modifications

fire and fire suppression

dams and water management/use

other ecosystem modifications

Invasive and other problematic species and genes

invasive non-native/alien species

problematic native species

introduced genetic material

Pollution

household sewage and urban waste water

industrial and military effluents

agricultural and forestry effluents

garbage and solid waste

air-borne pollutants

excess energy

Geological events

volcanoes

earthquakes/tsunamis

avalanches/landslides

Climate change and severe weather

habitat shifting and alteration

droughts

temperature extremes

storms and flooding

Please write here any additional threats and comments/queries you have on the threats.

Annex 1: Criteria for the inclusion of sites in the Flyway Site Network

(From the Partnership Text)

To be considered for inclusion in the Flyway Site Network, this Partnership adopts the following criteria:

- a. Convention on Wetlands (Ramsar, Iran, 1971) criteria for internationally important sites for migratory waterbirds. That is:
 - Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.
 - Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.
 - 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.

- b. The staging criteria as applied under the Asia - Pacific Migratory Waterbird Conservation Strategy. That is:
 - i. A staging site should be considered internationally important if it regularly supports 0.25% of individuals in a population of one species or subspecies of waterbirds on migration.
 - ii. A staging site should be considered internationally important if it regularly supports 5,000 or more waterbirds at one time during migration.

- c. Under exceptional circumstances a site can be nominated if it supports migratory waterbirds at a level or stage of their life cycle important to the maintenance of flyway populations. Justification of such nominations will be considered by the Partnership on a case by case basis.

Annex 2: Ramsar Classification System for Wetland Type

The codes are based upon the Ramsar Classification System for Wetland Type as approved by Recommendation 4.7 and amended by Resolutions VI.5 and VII.11 of the Conference of the Contracting Parties. The categories listed herein are intended to provide only a very broad framework to aid rapid identification of the main wetland habitats represented at each site.

To assist in identification of the correct Wetland Types to list in section 19 of the RIS, the Secretariat has provided below tabulations for Marine/Coastal Wetlands and Inland Wetlands of some of the characteristics of each Wetland Type.

Marine/Coastal Wetlands

- A -- **Permanent shallow marine waters** in most cases less than six metres deep at low tide; includes sea bays and straits.
- B -- **Marine subtidal aquatic beds**; includes kelp beds, sea-grass beds, tropical marine meadows.
- C -- **Coral reefs.**
- D -- **Rocky marine shores**; includes rocky offshore islands, sea cliffs.
- E -- **Sand, shingle or pebble shores**; includes sand bars, spits and sandy islets; includes dune systems and humid dune slacks.
- F -- **Estuarine waters**; permanent water of estuaries and estuarine systems of deltas.
- G -- **Intertidal mud, sand or salt flats.**
- H -- **Intertidal marshes**; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.
- I -- **Intertidal forested wetlands**; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.
- J -- **Coastal brackish/saline lagoons**; brackish to saline lagoons with at least one relatively narrow connection to the sea.
- K -- **Coastal freshwater lagoons**; includes freshwater delta lagoons.
- Zk(a) – **Karst and other subterranean hydrological systems**, marine/coastal

Inland Wetlands

- L -- **Permanent inland deltas.**
- M -- **Permanent rivers/streams/creeks**; includes waterfalls.
- N -- **Seasonal/intermittent/irregular rivers/streams/creeks.**
- O -- **Permanent freshwater lakes** (over 8 ha); includes large oxbow lakes.
- P -- **Seasonal/intermittent freshwater lakes** (over 8 ha); includes floodplain lakes.
- Q -- **Permanent saline/brackish/alkaline lakes.**
- R -- **Seasonal/intermittent saline/brackish/alkaline lakes and flats.**

- Sp -- **Permanent saline/brackish/alkaline marshes/pools.**
- Ss -- **Seasonal/intermittent saline/brackish/alkaline marshes/pools.**
- Tp -- **Permanent freshwater marshes/pools;** ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.
- Ts -- **Seasonal/intermittent freshwater marshes/pools on inorganic soils;** includes sloughs, potholes, seasonally flooded meadows, sedge marshes.
- U -- **Non-forested peatlands;** includes shrub or open bogs, swamps, fens.
- Va -- **Alpine wetlands;** includes alpine meadows, temporary waters from snowmelt.
- Vt -- **Tundra wetlands;** includes tundra pools, temporary waters from snowmelt.
- W -- **Shrub-dominated wetlands;** shrub swamps, shrub-dominated freshwater marshes, shrub carr, alder thicket on inorganic soils.
- Xf -- **Freshwater, tree-dominated wetlands;** includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.
- Xp -- **Forested peatlands;** peatswamp forests.
- Y -- **Freshwater springs; oases.**
- Zg -- **Geothermal wetlands**
- Zk(b) – **Karst and other subterranean hydrological systems, inland**

Note: “**floodplain**” is a broad term used to refer to one or more wetland types, which may include examples from the R, Ss, Ts, W, Xf, Xp, or other wetland types. Some examples of floodplain wetlands are seasonally inundated grassland (including natural wet meadows), shrublands, woodlands and forests. Floodplain wetlands are not listed as a specific wetland type herein.

Human-made wetlands

- 1 -- **Aquaculture** (e.g., fish/shrimp) **ponds**
- 2 -- **Ponds;** includes farm ponds, stock ponds, small tanks; (generally below 8 ha).
- 3 -- **Irrigated land;** includes irrigation channels and rice fields.
- 4 -- **Seasonally flooded agricultural land** (including intensively managed or grazed wet meadow or pasture).
- 5 -- **Salt exploitation sites;** salt pans, salines, etc.
- 6 -- **Water storage areas;** reservoirs/barrages/dams/impoundments (generally over 8 ha).
- 7 -- **Excavations;** gravel/brick/clay pits; borrow pits, mining pools.
- 8 -- **Wastewater treatment areas;** sewage farms, settling ponds, oxidation basins, etc.
- 9 -- **Canals and drainage channels, ditches.**
- Zk(c) -- **Karst and other subterranean hydrological systems, human-made**

Annex 3: IUCN Protected Areas Categories System

IUCN protected area management categories classify protected areas according to their management objectives. The categories are recognised by international bodies such as the United Nations and by many national governments as the global standard for defining and recording protected areas and as such are increasingly being incorporated into government legislation.

Ia Strict Nature Reserve

Category Ia are strictly protected areas set aside to protect biodiversity and also possibly geological/geomorphical features, where human visitation, use and impacts are strictly controlled and limited to ensure protection of the conservation values.

Ib Wilderness Area

Category Ib protected areas are usually large unmodified or slightly modified areas, retaining their natural character and influence without permanent or significant human habitation, which are protected and managed so as to preserve their natural condition.

II National Park

Category II protected areas are large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible, spiritual, scientific, educational, recreational, and visitor opportunities.

III Natural Monument or Feature

Category III protected areas are set aside to protect a specific natural monument, which can be a landform, sea mount, submarine cavern, geological feature such as a cave or even a living feature such as an ancient grove. They are generally quite small protected areas and often have high visitor value.

IV Habitat/Species Management Area

Category IV protected areas aim to protect particular species or habitats and management reflects this priority. Many Category IV protected areas will need regular, active interventions to address the requirements of particular species or to maintain habitats, but this is not a requirement of the category.

V Protected Landscape/ Seascape

A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural and scenic value: and where safeguarding the integrity of this interaction is vital to protecting and sustaining the area and its associated nature conservation and other values.

VI Protected area with sustainable use of natural resources

Information Sheet on EAA Flyway Network Sites

Category VI protected areas conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems.