

## Further Reading

Higgins, P. J. & Davies, S. J. (1996). *Handbook of Australian, New Zealand and Antarctic Birds, Vol 3: snipe to pigeons*. Oxford University Press, Melbourne.

National Parks & Wildlife Service (2002). *Threatened Species of the Upper North Coast of NSW – fauna*. NPWS, Coffs Harbour.

Marchant, P. & Higgins, P. J (1993). *Handbook of Australian, New Zealand and Antarctic Birds, Vol 2: raptors to lapwings*. Oxford University Press, Melbourne.

Priest, B., Straw, P., & Weston, M. (2002). *Shorebird Conservation in Australia*. Supplement to Wingspan: **12**, Birds Australia.

Sandpiper Environmental (2004). *Clarence Estuary Shorebird Issues Paper*. Unpublished report prepared for WWF Australia.

Umwelt. (2003). *Pathways to a Living Estuary: Clarence Estuary Management Plan*. Report prepared for Clarence River County Council.

## Further Information

Australasian Wader Studies Group - Tel: Birds Australia (03) 9882 2622. Website: [www.tasweb.com.au/awsg](http://www.tasweb.com.au/awsg)

Coastcare - Tel: (02) 6643 0239. Website: [www.ea.gov.au/coasts/coastcare](http://www.ea.gov.au/coasts/coastcare)

Department of Environment & Conservation – Website: [www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)

Environment Australia, Wetlands Section – Tel: 02) 6274 1111. Website: [www.ea.gov.au/water/wetlands/](http://www.ea.gov.au/water/wetlands/)

Legislation: [www.legislation.nsw.gov.au](http://www.legislation.nsw.gov.au)

NSW Wader Studies Group – Tel: (02) 9597 7765.

Sandpiper Environmental – Tel: 02) 6628 8223.

WetlandCare Australia – Tel: 02) 6681 6069. Website: [www.wetlandcare.com.au](http://www.wetlandcare.com.au)

WWF-Australia (Shorebird Conservation Project & Threatened Species Network) – Freecall: 1800 032 551. Website: [www.wwf.org.au](http://www.wwf.org.au)

## Acknowledgements

This fact sheet was prepared by Dr David Rohweder of Sandpiper Environmental (January 2006). Funding for the project was provided by WWF-Australia as Part of the National Shorebird Conservation Project. Scott Lenton, Rod Wright (Clarence Valley Council) and Bianca Priest (WWF-Australia) provided comments on a draft. All photographs were taken by David Rohweder. Cover photographs (top to bottom) foraging habitat in Wooloweyah Lagoon, Beach Stone-Curlews, typical roost site, bar-tailed godwits, pacific golden plovers and sanderlings roosting at high tide.



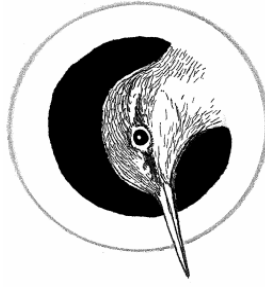
for a living planet®



Natural  
Heritage  
Trust

Helping Communities  
Helping Australia

An Australian Government Initiative



Sandpiper Environmental

# Shorebird Values and Threats in the Clarence Estuary



## A Guide for Clarence Valley Council Staff



### What are Shorebirds?

Shorebirds, or waders as they are also known, belong to the order Charadriiformes and include species that are colloquially known as plovers, sandpipers, oystercatchers, godwits and stone-curlews. Shorebirds can be classified into two main groups – migratory and resident. Migratory shorebirds breed in the northern hemisphere and spend spring and summer in Australia. The main breeding grounds occur in Alaska and Siberia and the birds fly up to 20,000 km annually with many individuals returning to the same non-breeding sites each year. During migration birds may travel through as many as 20 different countries. Resident shorebirds do not migrate outside of Australia, although some species undertake regular seasonal movements. Resident birds breed in Australia.



Whimbrels (*Numenius phaeopus*), a common migratory shorebird in the Clarence Estuary.

### Important Habitat Requirements

Shorebirds have three critical habitat requirements: 1. Roosts, sites where birds rest undisturbed at high tide; 2. Feeding areas where birds forage undisturbed at low tide; and 3. Nest sites. In estuarine environments, such as the Clarence estuary, habitat use is controlled by the tides. At high tide birds congregate at roosts, moving out to forage on intertidal mud and sandflats as the tide recedes. This pattern of behaviour is followed irrespective of whether it is day or night.

To satisfy their demanding annual cycle migratory shorebirds need to maximise food intake and minimise energy loss. To achieve this, birds often select roosts that are close to feeding areas. Ideally, roosts should have minimal human disturbance as frequent disturbance results in increased energy expenditure which affects the accumulation of fat reserves that are critical for migration.



The beach stone-curlew (*Esacus neglectus*) an endangered resident shorebird that resides in the Clarence River Estuary

Roost sites vary in type and size. They are typically above high water and are situated in open environments where birds have a clear line of sight, and they are often near the shoreline. The choice of foraging habitat is complex, although birds typically choose sites where they can maximise their food intake. Types of food include worms, crabs, bivalves and snails. There are numerous factors that influence the selection of nest sites with proximity to feeding areas and a clear line of site being important features. Shorebirds do not build complex nests but lay their eggs in a simple scrape in the sand with the only decoration being some twigs and leaves.

### Shorebird Conservation

There are various International, National and State mechanisms in place to protect shorebirds. In NSW, several species are listed as vulnerable or endangered on the *Threatened Species Conservation Act 1995*. Nationally, all migratory shorebirds are listed as *Migratory Species* on the *Environment Protection and Biodiversity Conservation Act 1999*. International programs include the Ramsar Convention and the Shorebird Action Plan for the East Asian-Australasian Flyway. The Flyway is the migration route used by migratory shorebirds visiting Australia.

### Shorebirds in the Clarence Estuary

Thirty-one species of shorebird, 22 migratory and 9 resident, are frequently recorded in the Clarence estuary (Table 1), whilst a further three species, sanderling, broad-billed sandpiper and pectoral sandpiper, are uncommon visitors.



Curlew sandpipers (*Calidris ferruginea*) an historically common in the Clarence Estuary but recent surveys have identified a substantial decline in numbers

e) Ensure that developers are aware of shorebird sites and how a development proposal may affect those sites. These issues could be raised at pre-DA meetings between CVC staff and developers.

f) Ensure that Councils statutory obligations under the *Environmental Planning & Assessment Act 1979*, *Threatened Species Conservation Act 1995* and *Environment Protection and Biodiversity Conservation Act 1999* are applied in assessing the impact of development proposals on shorebirds. Specific activities include: increased recreational activity on or near roost and foraging habitat, dredging and foreshore and wetland development.

### 3. Community Awareness -

Increased community awareness is a high priority for shorebird conservation. Council could increase awareness by:

- Supporting and implementing shorebird education programs to increase awareness of shorebirds and their habitats within the local community.
- Preparing information brochures for local estuary user groups, such as tourist operators and recreational clubs (fishing, boating, and 4WD).
- Providing informative signage at key sites.
- Encouraging user groups such as recreational fishing clubs and 4WD clubs to develop codes of conduct.
- Assist other regulatory authorities to develop guidelines on how estuary users can reduce impacts on shorebirds.

f) Educate the public about appropriate control of domestic animals when in the vicinity of important roost, foraging and nesting sites.

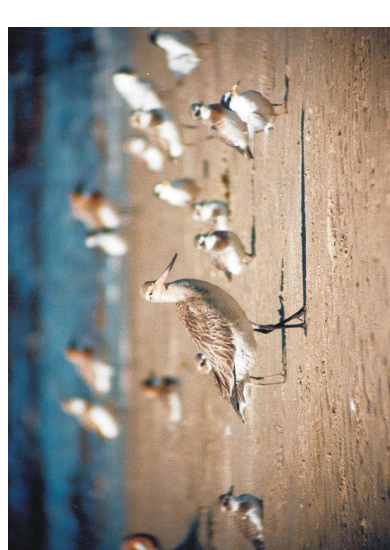
g) Educate the community on the location of Wildlife Refuges created under the Companion Animals Act.



Typical nest site of the endangered beach stone-curlew.

### 4. Other Important Contributions -

- Lobby state agencies to include priority sites in the Clarence Estuary Nature Reserve.
- Provide general support for programs to nominate wetlands to the Ramsar Convention.
- Forster partnerships with other Government Agencies such as Waterways NSW, with a view to developing guidelines on estuary use.
- Consider adopting a shorebird as a Council logo to promote estuary health. The beach stone-curlew would be an appropriate species.



Mixed flock of shorebirds and terns roosting at high tide. Shorebirds and terns commonly roost together in the Clarence Estuary, particularly at Dart Is., Joss Is & Rabbit Is.

5. Research – There are many aspects of habitat use and threats that are poorly understood. Research plays a vital role in gathering information on important habitats and quantifying the impact of threatening processes. Information gathered from research can be used to assist in the management of habitat.

The sites listed in Table 2 should be the initial focus of Regulation and Conservation actions. An adaptive approach to management should be adopted whereby the results of research or changes in habitat quality and use are considered during the review and development of management strategies.

### What CVC Staff can do for Shorebirds

Clarence Valley Council has a vital role to play in raising community awareness, protecting important habitats, regulating threatening activities and lobbying state agencies. Specific actions that could be implemented by Council to protect shorebirds are listed below. Some of the actions are beyond the legislative control of Council and fall under the control of State Government Agencies. In these instances CVC could lobby relevant agencies to improve protection and management of shorebird habitat.

#### 1. Strategic Planning -

- Zone important roost, foraging and nest sites for Environmental Protection.
- Map roost and foraging habitat and link mapping with planning processes.
- Review dog exercise areas to minimise impacts on roost, foraging and nest sites and designate sites as "Wildlife Refuges" under the *Companion Animals Act 1998*.
- Consider designating buffer zones around important, roost, foraging and nest sites and include buffers in environmental protection zones.
- Protect important sites from disturbance by prohibiting inappropriate activities, such as dogs, vehicles, boats, bait collection and in some cases pedestrians.
- Liaise with other statutory authorities to regulate threatening processes in the vicinity of important habitat. An example being a coordinated approach with Waterways NSW to designate no landing zones for boats at selected roost sites.
- Adopt the Actions from the Estuary Management Plan with respect to protecting

shorebird habitat. Relevant actions include: E1, E3, E24, E25, S8, S16, S18, W14, W21, W23 and U10.

h) Ensure that shorebirds are adequately considered during the preparation of management plans for Council Reserves and Crown land within the estuary that are managed by CVC.

i) Review 4WD access to important roost sites.

j) Consider the potential for development to impact on shorebirds and habitat and ensure that proponents provide a rigorous assessment of impacts. Council could develop a checklist to ensure that Development Applications (DA's) address all issues pertaining to impacts on shorebirds. The checklist could include: site location, proximity to habitat, activities proposed, impacts on foraging, roosting and nesting habitat, consideration of threatened and migratory species, impact mitigation measures, habitat compensation and the need for referral to Government Agencies.

#### 2. Development Control Planning –

- Ensure that planners are aware of shorebird habitat requirements and the location of important shorebird habitats in the Clarence estuary.
- Consider the potential for development to impact on shorebirds and habitat and ensure that proponents provide a rigorous assessment of impacts. Council could develop a checklist to ensure that DA's address all issues pertaining to impacts on shorebirds. Refer to pt j) in previous section.
- Provide digital habitat mapping to all planners and seek to minimise threats by advising developers prior to the lodgement of DA's and/or by imposing conditions of consent on DA's.
- Ensure that planners are aware of threatening processes and particularly the impact of human recreation on shorebirds.

The importance of the Clarence estuary for shorebirds has been recognised since the early 1980's. In autumn 1994 the population of shorebirds in the estuary was estimated at approximately 3000. Population surveys in 2005 recorded fewer birds, with declines noted for some species.

Table 1: Migratory (M) and Resident (R) shorebirds commonly recorded in the Clarence estuary. EPBC = *Environment Protection & Biodiversity Conservation Act 1999*; TSC = *Threatened Species Conservation Act 1995*.

Common Name	Migratory (M) or Resident (R)	Status
Latham's Snipe	M	EPBC
Black-tailed Godwit	M	EPBC, TSC
Bar-tailed Godwit	M	EPBC
Whimbrel	M	EPBC
Eastern Curlew	M	EPBC
Marsh Sandpiper	M	EPBC
Common Greenshank	M	EPBC
Terek Sandpiper	M	EPBC
Common Sandpiper	M	EPBC
Grey-tailed Tattler	M	EPBC
Wandering Tattler	M	EPBC
Ruddy Turnstone	M	EPBC
Great Knot	M	EPBC, TSC
Red Knot	M	EPBC
Red-necked Stint	M	EPBC
Sharp-tailed Sandpiper	M	EPBC
Curlew Sandpiper	M	EPBC
Beach Stone-curlew	R	TSC
Pied Oystercatcher	R	TSC
Sooty Oystercatcher	R	TSC
Black-winged Stilt	R	TSC
Red-necked Avocet	R	TSC
Pacific Golden Plover	M	EPBC
Grey Plover	M	EPBC
Red-capped Plover	R	EPBC
Double-banded Plover	M	EPBC, TSC
Lesser Sand Plover	M	EPBC, TSC
Greater Sand Plover	M	EPBC, TSC
Black-fronted Dotterel	R	EPBC, TSC
Red-kneed Dotterel	R	EPBC, TSC
Masked Lapwing	R	EPBC, TSC

The Clarence estuary is the third most important coastal shorebird site in NSW and provides habitat for seven species listed on the TSC Act and a further 21 species listed on the EPBC Act. The estuary is used as a staging or stopover area by several species and numerous individuals during the southward and northward migration which further increases its conservation value.

### Important Shorebird Habitats in the Clarence Estuary

Intertidal sand and mudflats, saltmarsh, ocean beaches, rock platforms, seagrass beds, rock groins, sandspits and sandbars exposed at high tide and some mature mangroves all represent potential shorebird habitat. Collectively, these habitats provide an important function for shorebirds as individuals move between habitats during day and night, at different tidal stages and, in the case of resident birds, to nest. It is difficult to confirm the distribution of important habitats without detailed survey and analysis of data; however, preliminary work has identified a list of primary shorebird roost and foraging sites (Table 2 and Figure A).

Table 2: Priority roost and foraging sites within the Clarence estuary.

Priority Roosts	Priority Foraging Areas
Joss Island (2 sites)	Joss & Corokos Islands
Corokos Island	Dart Island
Dart & Hickey Islands	Oyster Channel
Micalo Prawn Farm	Rabbit Is to Crystal Waters
Goodwood Island	North Arm - Iluka to Saltwater Inlet
Iluka Breakwater	Freeburn Island
The Peninsula	Thorny Island
Woody Head/Back Beach	Clarence Broadwater
Yamba Quays	
Rabbit Island	
Sleeper Island	

### Threats to Shorebirds in the Clarence Estuary

It is essential that shorebirds are able to roost and forage with minimal disturbance and the important physical and biological attributes of roosting, nesting and foraging areas are maintained.

Primary threats to shorebirds include:

- Habitat loss – removal of habitat through reclamation, urban development and severe erosion.
- Habitat modification – changes in the physical and biological characteristics of habitat.
- Habitat disturbance – activities that disturb roosting, foraging and nesting birds.
- Predation by introduced species – introduced species such as the red fox (*Vulpes vulpes*) prey on eggs and chicks.

Secondary threats include habitat pollution, resulting in the accumulation of toxic material in body fat and/or a reduction in the abundance of prey, and direct mortality from being hunted. The leaching of acidic water into estuarine systems is a local example of habitat pollution.

#### Habitat Loss

The zoning of several shorebird roosts has enabled development that would result in the loss of habitat. One prominent example is the ongoing development of Yamba Quays. The approval of a tourist facility on Goodwood Island could also affect important shorebird roosting habitat. Dredging is another process that can affect roost and foraging habitat.

#### Habitat Modification

Habitat modification is a broad term that includes a number of threatening processes such as vegetation encroachment onto roost and foraging areas, artificial lighting near roost and foraging sites, altered site drainage, shoreline stabilisation works and cattle grazing on saltmarsh. Several roosts, and some nest sites, in the Clarence estuary are affected by the growth of vegetation, which reduces sight distances eventually rendering sites unsuitable.

#### Habitat Disturbance

Habitat disturbance, particularly human recreation (i.e. walking/jogging, fishing, dog exercise, swimming, 4WD vehicles, jet skiing, and boating), pose a significant threat to shorebirds in the Clarence estuary. There are very few roost, nest or foraging sites that do not experience some disturbance from human activity. Disturbance is most pronounced during the spring and summer months, which coincide with the peak population of migratory shorebirds and the breeding of resident shorebirds.

At present, disturbance is most pronounced in the lower estuary and on ocean beaches, around Yamba and Iluka. However, as the human population expands, disturbance is expected to increase in other areas. Disturbance of birds at roosts increases energy expenditure which in turn influences fat accumulation and migration capability. The ability to accumulate fat reserves is inhibited when birds are disturbed whilst foraging. Likewise, birds disturbed from nest sites experience reduced breeding success as chicks and eggs are either predated or destroyed. Sites that experience high levels of human

disturbance include Dart Island, The Peninsula and Woody Head/Back Beach.

#### Predation

Introduced predators, such as the red fox (*Vulpes vulpes*) and feral cat (*Felis catus*) pose a direct threat to shorebird eggs and chicks. Fox control is undertaken annually on Dart and Hickey Islands to protect nesting oystercatchers (*Haematopus longirostris*).

#### Key Actions to Manage Shorebirds and their Habitat in the Clarence Estuary

Key actions to improve the management of shorebird habitat include:

1. Education and Awareness – Increasing the knowledge of the local community, tourists and regulatory authorities on how shorebirds use the estuary, threats to shorebirds and their habitat and how threats can be managed.
2. Regulation and Planning – Regulation and planning by local government and state agencies is vital to ensure that important habitats are protected and threatening processes are mitigated. Important shorebird roosts in the lower estuary have been mapped, enabling Clarence Valley Council (CVC) to recognise important sites and make informed decisions on the impact of developments on these sites.
3. Habitat Conservation – Protection of important habitats and management of threats can be improved through formal conservation measures such as, inclusion of sites within the Clarence Estuary Nature Reserve, nominating parts of the estuary to the Ramsar Convention, or designating sites as “Wildlife Refuges” under the *Companion Animals Act 1998*.
4. On-ground works – On-ground works include extension programs that educate the public and works that improve the quality and protection of habitat. Examples of on-ground works include fencing to restrict public and feral animal access and interpretive signage to increase community awareness of shorebird values at sites under threat.

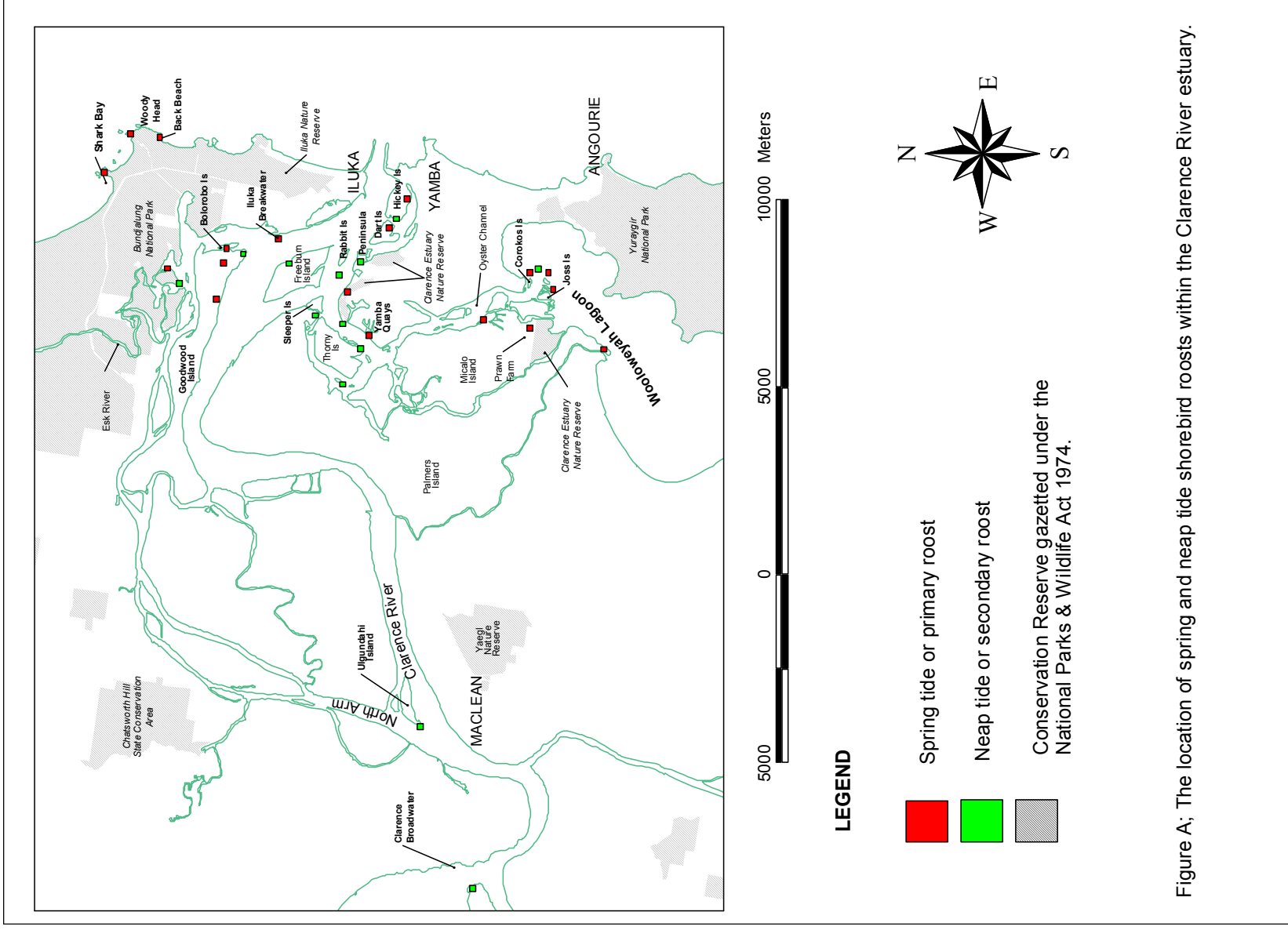


Figure A; The location of spring and neap tide shorebird roosts within the Clarence River estuary.