Caboolture Shorebird Habitat Mapping Project

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"*The Caboolture District is one of Southeast Queensland's undiscovered, environmental gems with a rich natural heritage that would probably surprise most residents and visitors*" (Czechura and Weston 2008).

INTRODUCTION

Moreton Bay supports up 40,000 shorebirds that feed in coastal intertidal wetlands during the summer. Moreton Bay forms part of the East Asian/Australasian flyway through which shorebirds travel twice a year on migration. About 2 million shorebirds migrate to Australia every year, travelling up to 25,000 km.

Internationally significant numbers of eight species of migratory shorebirds spend their non-breeding season in Moreton Bay, which contributed to it being listed as a Ramsar Wetland in 1996. The Caboolture district of Moreton Bay Regional Council (formerly Caboolture Shire Council) has extensive coastal wetlands that support up to 40% of the shorebird population in Moreton Bay.

Shorebirds are an important indicator of the health of Moreton Bay. Conserving shorebirds involves protection of their habitat across multi-jurisdictional boundaries. They feed predominantly within the Moreton Bay Marine Park and roost above the highest astronomical tide, which falls outside the Marine Park boundaries.

The coastline fringing Moreton Bay Marine Park is Australia's fastest growing urban area, having experienced significant population and economic growth. Urban development, vegetation clearing, water pollution and climate change impacts are all increasing pressure on these coastal values.

In late 2007, the former Caboolture Shire Council (now Moreton Bay Regional Council) contracted the Queensland Wader Study Group (QWSG) and a local shorebird consultant, to map high tide roost boundaries and characteristics to inform Council's statutory planning instruments. Council sought endorsement of the project outputs in January 2008 from the relevant State and Commonwealth Agencies, prior to being completed in February 2008.

The project aimed to provide improved habitat protection and planning outcomes for shorebirds. It resulted in twenty-four roost sites being mapped in the Caboolture district, five of which are available to shorebirds on higher king tides. The project outputs will enable council and other land managers to better conserve and appropriately manage important shorebird sites in the region.

The final report from the project constitutes one of several background studies that will inform the new Moreton Bay Regional Council's (formerly Caboolture and Pine Rivers Shire and Redcliffe City Councils) Local Nature Conservation Strategy. Ultimately the mapping will inform future amendments to Council's planning scheme. The QWSG are keen to ensure shorebird habitat is mapped across the entire Moreton Bay Ramsar Wetland. This project provides a good model upon which to base such a project.

BACKGROUND

Shorebirds comprise 10% of Australia's bird species. Most shorebirds breed in Siberia and Alaska and travel the East Asian/Australasian flyway twice a year on migration. About 2 million shorebirds migrate to Australia every year, travelling up to 25,000 km. From September to April, a large number of shorebird species (up to 40,000 birds) are found in Moreton Bay. Some shorebirds reside in one location for their entire lives, and are known as 'resident' shorebirds. Many shorebirds roost (or rest) above the high tide mark and feed at low tide in mud flats.

Although there are 112 identified shorebird roost sites in Moreton Bay, only 15 of these are available to shorebirds during the particularly high spring tides that occur on a few days of each month. At these times, all of Moreton Bay's shorebirds are crowded into the limited roost areas, and disturbance during this time is more critical than usual. A significant number of these roosts lie outside the boundary of the Marine Park at the Highest Astronomical Tide (HAT) line.

Shorebirds are vulnerable to a number of threats throughout their range including habitat loss and degradation, pollution, hunting, and disturbance from people, dogs, competition, vehicles, vessels and exotic pests. The major threat in Queensland is the inadequate protection of shorebird roosting and feeding sites, and threats from pollution. Table 1 outlines the international and commonwealth mechanisms for protection of shorebirds and/or their habitat.

Table 1: International and Commonwealth Mechanisms for Shorebird Protection

Mechanism	Level of Protection	Protection Provided
1971 Ramsar Convention	International	Protects wetlands of international significance
1974 Japan Australia Migratory Bird Agreement and *1986 China Australia Migratory Bird Agreement*	International	Requires parties to protect migratory birds and their environments
Environmental Protection and Biodiversity Conservation Act 1999	National	Sections 16 and 17 protect Ramsar Wetlands of Moreton Bay as a matter of National Environmental Significance
National Plan for Shorebird Conservation in Australia 1993	National	Aims to protect shorebird roosting and feeding sites
Marine Park (Moreton Bay) Zoning Plan	State	Prohibition on disturbing shorebirds
Nature Conservation (Wildlife) Regulation 2006	State	Provides additional protection within State legislation
State Coastal Management Plan 2001; and *SEQ Regional Coastal Management Plan 2006*	State	Protects beaches providing significant wildlife habitats (including roosting, nesting and breeding habitat for shorebirds); Identifies areas of coastal biodiversity significance (marine) and development assessment requirements

Other statutory and policy mechanisms in place at the State and local level to protect shorebirds and their habitats include:

- State Shorebird Management Strategy: Moreton Bay 2005;
- Strategy for Conservation and Management of Queensland's Wetlands 1999;
- Marine Parks (Moreton Bay) Zoning Plan 1997;
- SEQ Regional Plan 2009 – 2031 (in prep);
- SEQ NRM Plan 2009 – 2031 (in prep);
- Local Government Planning Schemes; and
- Moreton Bay Regional Council's Local Nature Conservation Strategy (in prep).

The QWSG is one of many across Australia that are working towards the protection of shorebirds by providing scientific information, and advocating both for the preservation and wise management of their habitat. The QWSG is a special interest group within Birds Queensland.

METHODS

The project aims and objectives were to:

1. Liaise with council planning officers (and Environmental Protection Agency or EPA officers) to determine roost attributes to be collected and information required for planning guidelines;
2. Extract the location details (latitude and longitude) of all shorebird high tide roosts in Caboolture Shire recorded in the QWSG database;
3. Plot the boundaries of these and other known shorebird roosts using Global Positioning System (GPS) unit/s;
4. Liaise with Council's GIS officers to generate a map of shorebird high tide roosts (using the GPS data) to inform the relevant local government planning scheme;
5. Develop a simple set of guidelines to support the map of shorebird high tide roosts, also to inform the relevant local government planning scheme, including general shorebird information, threats and management considerations;
6. Seek QWSG and EPA endorsement of the habitat mapping data and planning guidelines; and
7. Identify and formalise procedures for ongoing sharing of QWSG shorebird count data with local government to guide decision-making.

The methodology adopted for the project was developed by the QWSG. The QWSG has been undertaking shorebird high tide roost counts in Moreton Bay since 1992. The QWSG has developed a high tide roost habitat classification system which has been applied to roosts throughout Queensland that have been surveyed by QWSG (refer Table 2). This classification system identifies the major characteristics of the habitats used by shorebirds. It classifies both coastal and inland roosts and covers the range of site characteristics found at both marine and freshwater wetlands. Each roost was defined by a combination of up to six of the habitat codes depending on its characteristics.

Table 2: Roost Habitat Codes (Milton and Dening 2008)

Site location	Code	Water definition	Code	Substrate	Code
Coastal tidal	T	Marine	C	Sand	S
Coastal non-tidal	N	Freshwater	F	Mud	M
Coastal open water	O	Brackish	B	Rock	R
Coastal bay, inlet or estuary	E	Dry	D	Other	X

Site location	Code	Water definition	Code	Substrate	Code
				(specify)	
Coastal lake, swamp or lagoon	L				
Inland (> 10 km from sea or estuary)	I				

In early 2008, the QWSG also undertook to map shorebird habitat and undertake a concurrent shorebird count across the entire Moreton Bay Ramsar Wetland. The habitat mapping undertaken for the Caboolture project has informed and complements the broader Moreton Bay Ramsar Wetland study.

RESULTS

A total of 24 shorebird high tide roosts were identified from the QWSG count database and initial site visits. Among the roosts, there were six different habitat classifications identified (refer Table 3). In order to better understand the types of habitats present in each roost habitat classification, photographs of an example of each habitat classification are provided in the final project report prepared by QWSG.

Milton and Dening (1998) found that differences among roost habitat classes can be subtle, but are linked to their use by different species. Some species of shorebird will use most habitats as a roost if they are available near their feeding grounds. Other species will fly further to roost at a site that has their preferred roost habitat characteristic. These species will not use other roost habitats unless their preference is not available (such as during king tides) or excessively disturbed.

Table 3: High Tide Roost Classifications within the Caboolture District

No	QWSG site code	QWSG roost name	Roost type	Habitat classification
1	LIPK	Lime Pocket	1 and 3	TECSM
2	GMCK	Glass Mountain Creek claypan	1	TECM
3	GMTR	Glass Mountain Creek tree roost	3	TECM
4	MIPT	Mission Point	1	TECSM
5	PCMP	Poverty Creek behind Mission Point	1	TECM
6	POCK	Poverty Creek	1	TECS
7	DOJT	Donnybrook Jetty	1	TECSM
8	DONN	Donnybrook claypan	1	TECM
9	BULL	Bullock Ck mouth claypan	1	TECM
10	TRCC	Toorbul Crescent	1	TECM
11	TRSS	Toorbul sandspit	2	TECSM
12	TRNT	Toorbul north	1	TECSM
13	TRSF	Toorbul Sandfly Bay	1	TECSM
14	TOOR	Toorbul main roost	1	TECSM
15	KKBC	Kakadu Beach	1	TECS
16	DUCR	Dux Creek, Bribie Island	1	TECM
17	SAPT	Sandstone Point	1	TECSMR
18	BUCK	Buckleys Hole lagoon	1	LFSM
19	BHBI	Buckleys Hole sandspit, Bribie Island	1	TECS
20	GOBC	Godwin Beach	2	TECSM
21	CABO	Caboolture River mouth	1	TECM
22	DBBA	Deception Bay claypan	1	TECM
23	DBFR	Deception Bay central (DPI)	2 and 3	TECMR

No	QWSG site code	QWSG roost name	Roost type	Habitat classification
24	DBMN	Deception Bay south	1	TECM

In order to accurately define each roost, a field visit was made to each site at a moderate to spring high tide during February 2008. Aerial photographs (1:10,000) of each roost were obtained prior to the visits. The location of each fix was noted on the aerial photograph and assigned a number. GPS fixes, roost habitat characteristics and known or potential threats were listed on a field sheet. The annotated maps were returned to the Caboolture Shire Council GIS officer for digitising a GIS polygons for each roost.

To support this GIS layer, available information on each shorebird roost was summarised. For each roost, the average and maximum number of each shorebird species using the roost, the number of times each species was seen at each roost, the roost habitat characteristics and threats to its viability as a roost were described and collated into a detailed roost classification and description (refer Table 3.3 in Milton and Dening 2008). These data used in conjunction with the GIS mapping layer developed within Council and provide the facts to support their definition as a shorebird roost.

The results show that roosts that are used by shorebirds on the higher tides are limited to only 19 of the roosts within Moreton Bay (Milton and Dening 2008). Five roosts in Caboolture district can be considered critical king tide roosts (tides > 2.3 m) and they include Donnybrook Claypan, Kakadu Beach Bribe Island, Dux Creek, Buckley's Hole Sandspit, and the Deception Bay Claypan.

DISCUSSION

Conserving shorebirds involves protection of their habitat across multi-jurisdictional boundaries. Shorebirds feed predominantly within the Moreton Bay Marine Park and roost above the HAT, which falls outside the Marine Park boundaries. The project resulted in twenty-four roost sites being mapped in the Caboolture district, five of which are available on higher king tides.

The approach to the project was a collaborative one, recognising existing expertise and data already gathered by the QWSG over the last 15 years. They hold one of the largest shorebird datasets in Australia. The local knowledge provided by the QWSG and community experts was invaluable in achieving technical rigour and consistency of approach.

The collaborative / mutual benefit approach was an effective means of ensuring:

- shorebird habitat was mapped seamlessly across a range of jurisdictions;
- that the output reflected and, where relevant, strengthened the various protection mechanisms available at a range of levels;
- facilitating information exchange and a cost effective planning output; and
- ongoing collaboration to harness further policy and planning initiatives.

This cooperative approach between stakeholder groups has resulted in the initiation of a range of other shorebird projects, in which Council is playing a major role, including the Moreton Bay Shorebird Monitoring Project and shorebird education initiatives.

The project outputs will inform the new Moreton Bay Regional Council's Local Nature Conservation Strategy, which will address policy, planning and management requirements for biodiversity and the natural environment, as required by the statutory and policy mechanisms outlined in this paper, particularly the Southeast Queensland (SEQ) Regional Plan 2009-2031 and the preeminent SEQ NRM Plan 2009-2031, once finalised.

CONCLUSION

Better planning by local governments is needed to help reduce the impacts of people on shorebirds (Milton and Dening 2008). Coastal Councils need to be aware of the locations of shorebird high tide roosts when assessing new coastal development applications. They also need to be aware of the impact of disturbance on shorebird energy budgets and take steps to minimise disturbance to roosting shorebirds (Milton and Dening 2008). The first step in improving development assessment outcomes is to identify and map existing shorebird roosting habitats within each council's jurisdiction.

TAKE HOME MESSAGES

- Internationally significant numbers of eight species of migratory shorebirds spend their non-breeding season in Moreton Bay, which contributed to it being listed as a Ramsar Wetland in 1996.
- The Caboolture district of Moreton Bay Region has extensive coastal wetlands that support up to 40% of the shorebird population in Moreton Bay.
- Coastal councils have a core responsibility to identify and protect shorebirds and their habitat and it is possible to identify shorebird habitat values for local government planning purposes.
- The project outputs will both inform the development of a Local Nature Conservation Strategy for the Moreton Bay Region and will be incorporated into Council's planning scheme/s.
- Council and the QWSG are keen to ensure shorebird habitat is mapped across the entire Moreton Bay Ramsar Wetland; this project provides a good model upon which to base such a project.

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