Birds on Newcastle's rock platforms

Chris Herbert
17 The Quarterdeck Carey Bay, NSW, 2283

Eighteen species of non-passerine birds were recorded on coastal rock platforms along Newcastle's rocky foreshore, which extends southwards from Nobbys Beach to Burwood Beach. The rock platforms are used as a roost by many waterbirds including gulls, cormorants and a variety of terns. Only a few species regularly depend on the rock platforms for foraging such as: Sooty Oystercatchers (*Haematopus fuliginosus*), Ruddy Turnstones (*Arenaria interpres*) and Eastern Reef Egrets (*Egretta sacra*). Other birds that forage, but are less regular visitors, include: Red-necked Stints (*Calidris ruficollis*), Grey-tailed Tattlers (*Heteroscelus brevipes*) and White-faced Herons (*Egretta novaehollandiae*). Some Silver Gulls (*Larus novaehollandiae*) forage on the rocks, but most forage elsewhere. Silver Gulls and Crested Terns (*Sterna bergii*) were the most abundant species and were often recorded in the hundreds. Sooty Oystercatchers were the third-most common bird with a maximum of 26 birds recorded. Ruddy Turnstones were the fourth-most abundant bird (9), although more than 50 have been recorded in the past. Common Tern (*Sterna hirundo*), White-fronted Tern (*Sterna striata*), Caspian Tern (*Sterna caspia*) and Red-necked Stints were recorded sporadically. Eighteen species have been recorded during summer since records began in 1972, reducing to 12 species during winter. Summer migrants to the rock platforms included Ruddy Turnstones, Red-necked Stints, Grey-tailed Tattlers and Common Terns. White-fronted Terns are winter migrants. The northernmost rock platform, between Nobbys Beach and Newcastle Beach (Newcastle Rock Platform), was the favoured foraging area for most species. In addition, the most important roost site was also located there, on the seaward side of Newcastle Ocean Baths.

INTRODUCTION

During 2005, Newcastle City Council commissioned the Hunter Bird Observers Club (HBOC) to examine avian use of rock platforms in the Newcastle Local Government Area. The study identified current and historical avian biodiversity and use of the rock platforms so that management options could be developed as part of a broader plan for managing natural resources within the Newcastle City landscape (Herbert 2006). The study aimed to record and discuss:

- species diversity;
- abundance;
- status of rock platform frequenting birds;
- habitat use;
- historical bird diversity and abundance;
- differences between rock platforms;
- threatening processes and disturbances;
- management options and recommendations.

The first five points are summarized below in 'Results' and the last three are addressed in 'Discussion'.

METHODS

The study involved winter and summer observations during 2005/06 on coastal rock platforms, from Nobbys Beach southwards to Burwood Beach, and recent observations from HBOC members. Data on historical bird diversity and abundance was obtained from HBOC's data base, HBOC's Annual Bird Reports, Birds Australia New Atlas and Old Atlas, New South Wales Bird Atlassers, and National Parks and Wildlife Service Wildlife Atlas Database.

Study Area

For this study Newcastle's rock platforms were grouped into three discrete rock platforms separated by sandy beaches (**Figure 1**). From north to south, these rock platforms were:

- **Newcastle Rock Platform**: from Nobbys Beach to Newcastle Beach;
- **Shepherds Hill Rock Platform**: from Newcastle Beach to Bar Beach; and
- **Merewether Rock Platform**: from Merewether Beach to Burwood Beach.

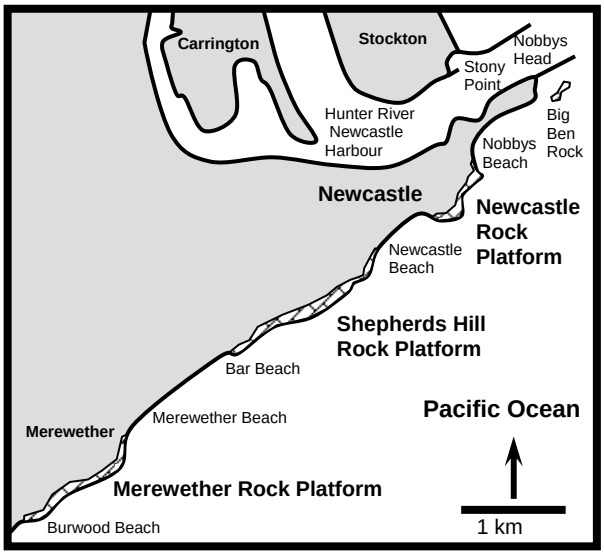

Figure 1 – Newcastle rock platforms can be grouped into three discrete platforms separated by sandy beaches: Newcastle Rock Platform; Shepherds Hill Rock Platform; and Merewether Rock Platform.

Note that when referring collectively to all three rock platforms the term "rock platforms" (uncapitalised and plural) will be used.

Observations

Three rock platforms were surveyed for birds and available habitats over three days in winter (4, 15 and 21 July 2005) and three days in summer (28, 29 and 30 January 2006). Two observers, Liz Crawford and Chris Herbert, carried out winter and summer observations and were assisted by Judith Thomas during summer observations. Binoculars and a spotting telescope were used to observe and record bird diversity, abundance and behaviour. Each rock platform was surveyed from vantage points and lookouts using binoculars and telescopes. This rapid survey method allowed observers to cover the three major rock platforms in a short time frame so that significant movements of birds were readily observed, minimising double counting. Rock platform inspections were also carried out on foot to observe behaviour and disturbances, especially at lower tides. Locations of birds were plotted on large-scale aerial photos and subsequently transferred to **Figures 2** and **3**. Most passerine birds are not obligate rock platform users and not dependant on rock platforms for their survival. Therefore, their presence was considered incidental and they were not considered in this study.

RESULTS

Species Diversity

On a daily basis, both the diversity and abundance of rock platform frequenting birds varied depending on the state of the tide. During six days of observation (three days in winter and three days in summer), the diversity of bird species on a single day on the rock platforms ranged from a maximum of six species at high tide to nine species at low tide. On any single day, Newcastle Rock Platform had the highest diversity with as many as nine species present. Merewether Rock Platform was second in diversity with as many as five species and Shepherds Hill Rock Platform had the least diversity with up to three species. Thus, the Newcastle Rock Platform supported twice the diversity of bird species compared to the Shepherds Hill and Merewether Rock Platforms (**Table 1**). There was also a seasonal change in diversity where 18 species recorded in summer decreased to 12 species in winter, mainly because of absent summer migrants (**Table 2**).

Abundance

The most abundant birds observed on the rock platforms were Silver Gulls. Their numbers doubled from a maximum of 313 during winter observations to 605 during the summer observations (**Table 2**). In contrast, Crested Terns, the second most abundant bird species, decreased considerably in abundance from a maximum of 232 during the winter observations to 51 during summer observations for this study. This trend is not so evident in **Table 2** which does not compare summer and winter counts during the same year. Sooty Oystercatchers were the third most numerous of the consistently present rock-platform frequenting birds with a maximum of 26 recorded (see later discussion on Sooty Oystercatchers regarding seasonal abundance). The number of summer-migrating terns falls to zero during winter whereas during winter, migrating White-fronted Terns appear. Nine Ruddy Turnstones were recorded during summer observations in January 2006, but only one was observed over-wintering during July 2005 (historically up to two have been recorded over-wintering). All other rock-platform frequenting birds, when present, numbered less than ten of each species. Only one Eastern Reef Egret, and no more than three White-faced Herons, were seen on the entire rock platforms at any one time. Two Eastern Reef Egrets have recently been observed (R. McDonald pers. comm. 2007).

Table 1. Bird diversity and maximum number of birds recorded during six survey days (July 2005 & January 2006).

Species	**Newcastle Rock Platform**	**Shepherds Hill Rock Platform**	**Merewether Rock Platform**
Little Pied Cormorant	2	1	
Little Black Cormorant	4	1	
Great Cormorant	1 (4 *)	(5 *)	(5 *)
Australian Pelican	8		
White-faced Heron	1	1	2
Eastern Reef Egret			1
Ruddy Turnstone	9		
Sooty Oystercatcher	16 **	14	6
Silver Gull	231	52	349
Crested Tern	231		28
White-fronted Tern	5		
Total No. of Species	**10**	**5**	**5**

* In vicinity of rock platform, on power poles, potentially rock-platform frequenting.
** 26 recorded later during March 2006.

Table 2. Seasonal bird[1] diversity and abundance on Newcastle rock platforms (maximum number from 1972 to present).

Species	**Summer** **(Sept-Apr)** **Maximum No.**	**Winter** **(May-Aug)** **Maximum No.**	**Status**	**Protection**
Australian Pelican	6	8	Resident	
Little Pied Cormorant	2	2	Resident	
Pied Cormorant	Recorded	Recorded	Resident	
Little Black Cormorant	4	3	Resident	
Great Cormorant	1 (12 on poles)	(9 on poles)	Resident	
White-faced Heron	3	1	Common resident	
Eastern Reef Egret	1	1	Rare	
Grey-tailed Tattler	1	0	Summer migratory wader	JAMBA/CAMBA[3]
Ruddy Turnstone	>50	2 (7 Stony Point)	Uncommon summer migratory wader	JAMBA/CAMBA
Red-necked Stint	1-5 (21 on Big Ben Rock, Nobbys Reef)	0	Summer migratory wader	JAMBA/CAMBA
Sooty Oystercatcher	26	22	Resident	Vulnerable - TSC Act[4]
Pacific Gull	0	1[2]	Accidental visitor	
Kelp Gull	1	0	Accidental visitor	
Silver Gull	605	313	Common resident	
Caspian Tern	>30	0	Resident	CAMBA
Crested Tern	>200	232	Common resident	JAMBA
White-fronted Tern	0	>17	Uncommon winter migrant	
Common Tern	>250	0	Summer migrant	JAMBA/CAMBA
Little Tern	16	0	Summer migrant	Endangered - TSC Act
White-winged Black Tern	1[2]	0	Summer migrant	JAMBA/CAMBA

[1] Rock-platform frequenting birds only, [2] Flying, [3] Japan-Australia Migratory Birds Agreement/ China-Australia Migratory Birds Agreement, [4] NSW Threatened Species Conservation Act 1995.

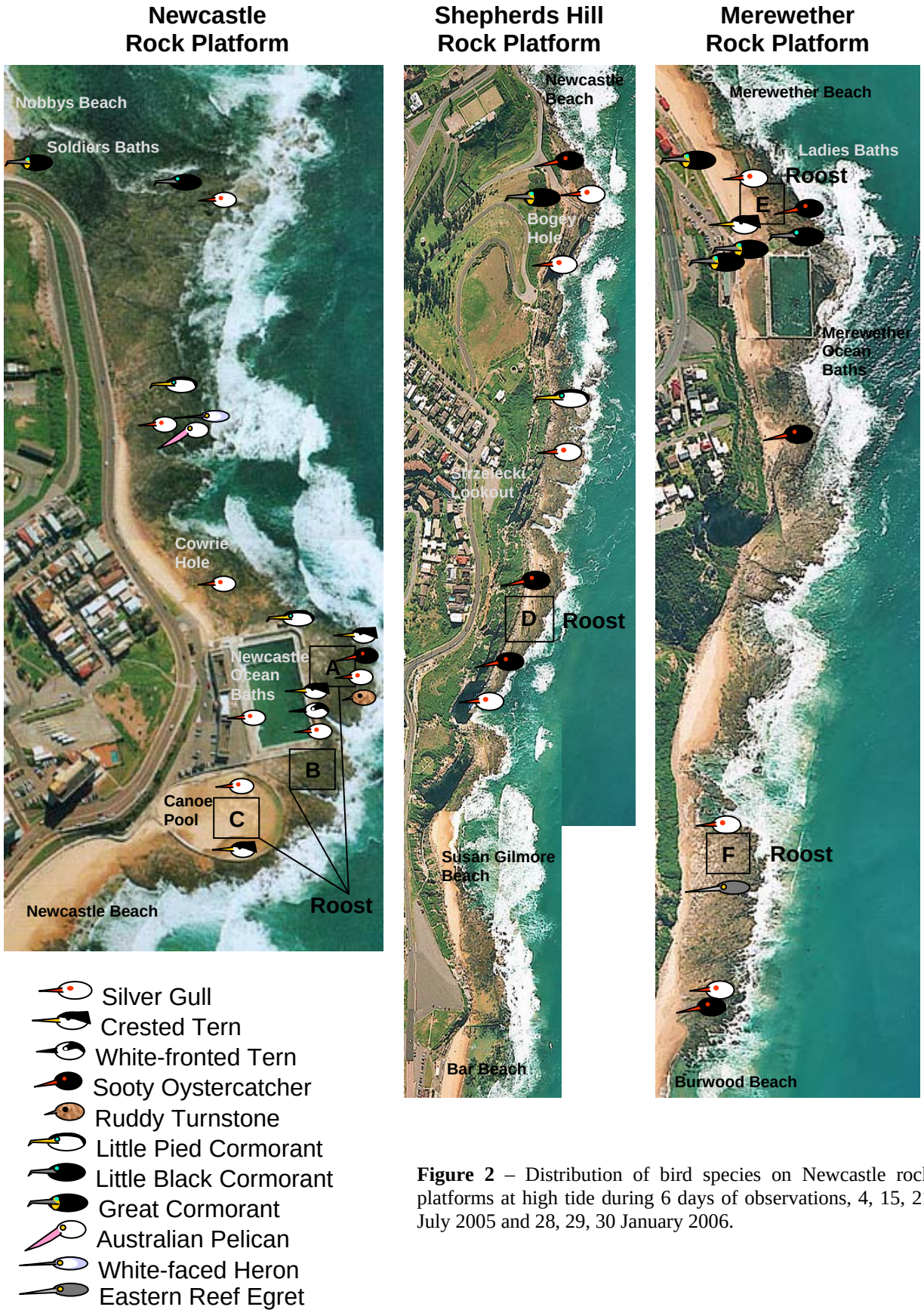

Figure 2 – Distribution of bird species on Newcastle rock platforms at high tide during 6 days of observations, 4, 15, 21 July 2005 and 28, 29, 30 January 2006.

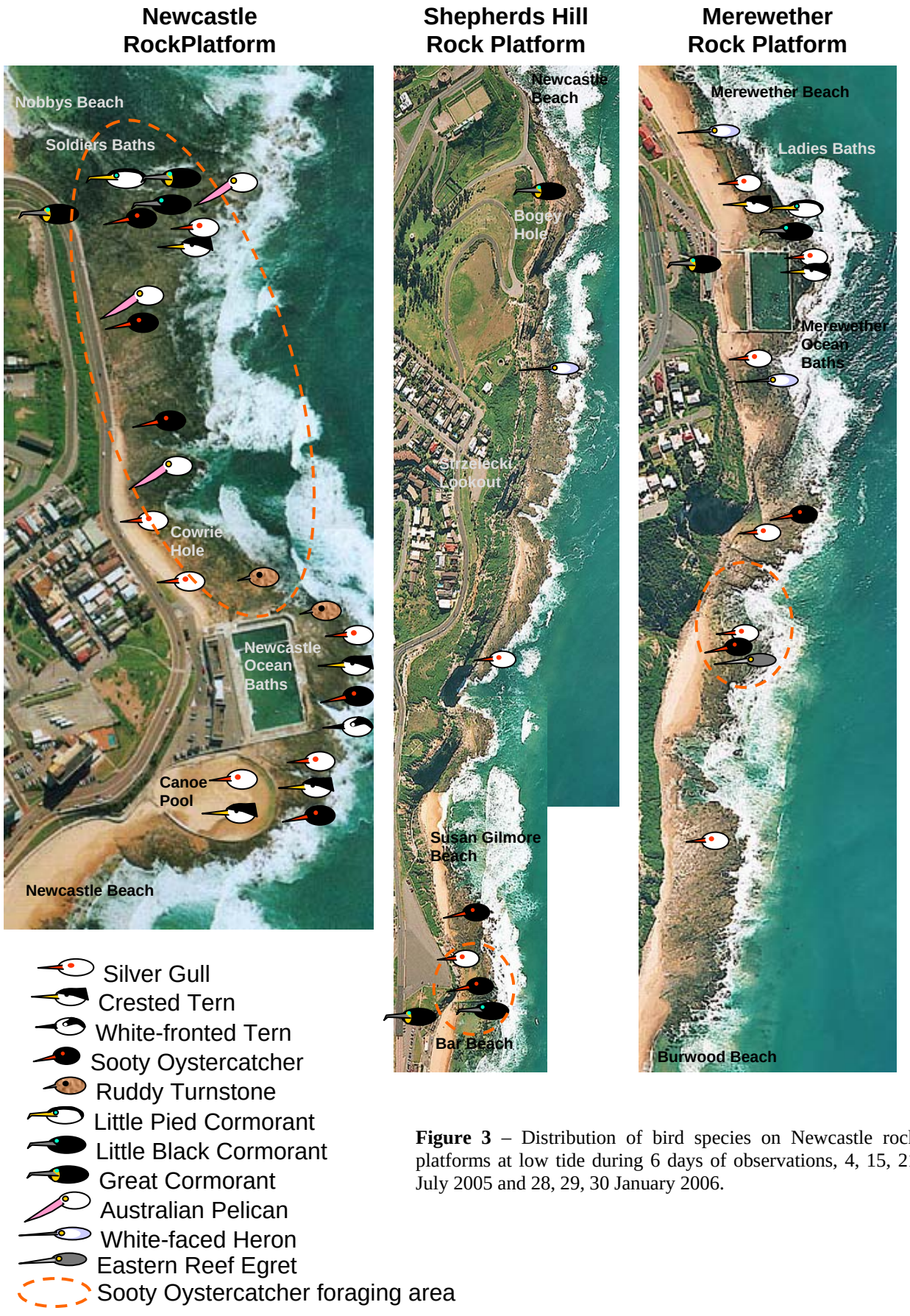

Figure 3 – Distribution of bird species on Newcastle rock platforms at low tide during 6 days of observations, 4, 15, 21 July 2005 and 28, 29, 30 January 2006.

Status of Rock-Platform Frequenting Birds

The following discussion is based on six days of observations for this study, personal observations and historical data from 1972 to present (Herbert 2006).

Australian Pelican *(Pelecanus conspicillatus)*

Although a common resident in the Hunter Region, only eight Australian Pelicans were recorded on the rock platforms, and then only on the Newcastle Rock Platform. There are limited foraging opportunities on the rock platforms for large numbers of these birds. During calm conditions, pelicans have been observed swimming and foraging along the seaward edge of the Newcastle Rock Platform. However, their main interest appears to be scraps discarded by fishermen (**Figure 4)**. The closest breeding areas are located at Pelican Island in Wallis Lake and in Brisbane Water.

Caspian Tern *(Sterna caspia)*

Caspian Terns are regarded as residents in the Hunter Region. They were recorded only once during the study roosting on the Merewether Rock Platform. As many as 30 were observed in 2001. Other sightings were from Nobbys Beach, not the rock platforms. There are no breeding records for the Hunter Region.

Silver Gull *(Larus novaehollandiae)* and Crested Tern *(Sterna bergii)*

Silver Gulls and Crested Terns are common residents (**Figures 5** & **6**). This is reflected by their presence in large numbers on the rock platforms (as many as 605 gulls and 231 terns). They are not known to breed along the rock platforms, but do so in large numbers on Moon Island off the entrance to Lake Macquarie, and on Sandy Island, at the drop-off into Lake Macquarie. Moon Island supports as many as 1000 nesting pairs of Silver Gulls and 500 pairs of Crested Terns (Alan Morris pers. comm.).

Common Tern *(Sterna hirundo)* and Little Tern *(Sterna albifrons)*

More than 250 Common Terns and up to 16 Little Terns have been recorded as summer migrants to the rock platforms. They often roost at Newcastle Ocean Baths at Roost A (**Figures 2** & **7**). Common Terns breed outside Australia, but Little Terns breed locally at Forster and The Entrance, to the north and south of Newcastle respectively. Both breeding sites need active conservation management and intervention to maintain their viability. Little Terns have also bred historically in the Hunter Estuary, at Dark Point and the Big Gibber north of Hawks Nest, and at Red Head south of Newcastle. The most likely local area for future potential breeding may be the rehabilitated Stockton Sandspit. Little Terns are listed as endangered under the NSW Threatened Species Conservation Act, 1995.

Kelp Gull *(Larus dominicanus)* and Pacific Gull *(Larus pacificus)*

Single Kelp Gulls have been reported twice on the Newcastle Rock Platform and a single Pacific Gull, flying past, has been reported. These should be regarded as rare, accidental visitors.

White-winged Black Tern *(Chlidonias leucopterus)*

White-winged Black Terns are summer migrants. There is only one record of a bird on the rock platform, at Newcastle Ocean Baths, although as many as 30 have been observed flying around Newcastle Harbour. They should be regarded as accidental to the rock platform, being more likely to be observed flying over the harbour or roosting on navigation buoys and on boulders around the harbour foreshore. White-winged Black Terns normally breed in the northern hemisphere.

White-fronted Tern *(Sterna striata)*

White-fronted Terns are uncommon winter migrants (**Figure 8**). Most White-fronted Terns breed in New Zealand and migrate to southeastern Australia in winter. In the past, more than 17 have been observed roosting at Newcastle Ocean Baths, 20 on Stockton Breakwater and 40 on Stockton Beach.

Sooty Oystercatcher *(Haematopus fuliginosus)*

Sooty Oystercatchers (**Figure 9**) are regarded as uncommon non-breeding residents in the Newcastle area and are listed as vulnerable under the NSW Threatened Species Conservation Act, 1995. Twenty-six were observed on the rock platforms during 2006 (in March, after the January field work for this study). A maximum of eight Sooty Oystercatchers was recorded during the 1990s. However, from a low point of one in

Figure 4. Pelicans waiting for scraps discarded by fishermen on the Newcastle Rock Platform.

Figure 5. Silver Gulls.

Figure 6. Crested Terns.

Figure 7. Roost A on the seaward side of Newcastle Ocean Baths.

Figure 8. White-fronted Terns.

Figure 9. Sooty Oystercatcher feeding on a limpet.

Figure 10. Ruddy Turnstone.

Figure 11. Great Cormorant roosting on a light pole.

the year 2000 the number reported increased each year to a maximum of 26 in 2006 (**Figure 12**). Hopefully this indicates a real increase in breeding success in the region rather than simply an increase in the rate of observations. Field observations suggest that this population may have a home range extending southwards towards Lake Macquarie.

Each year numbers decline from July to October before gradually increasing to maximum numbers from January to June. Although this trend, shown on **Figure 13**, is supported by only a small amount of data, it is also evident for Boat Harbour (Kurnell), Long Reef (Narrabeen) and the Central Coast.

Sometimes the total resident population of Sooty Oystercatchers can be observed foraging and roosting on the Newcastle Rock Platform. At other times they can be dispersed along the entire length of the rock platforms, including Shepherds Hill and Merewether Rock Platforms. At low tide they also forage along the Hunter River shoreline at Stony Point, on oyster-banks off Stockton Sandspit, on the Kooragang Dykes and on Big Ben Rock, Nobbys Reef (**Figure 1**). At high tide they roost mainly on the Newcastle Rock Platform, at the most important roost immediately seaward of Newcastle Ocean Baths (Roost A), but also on Shepherds Hill Rock Platform (Roost D) and Merewether Rock Platform, Kooragang Dykes and Stony Point.

Sooty Oystercatchers generally breed on offshore islands or secluded headlands. However, offshore islands are absent from the Newcastle area. The nearest probable breeding site is Moon Island, off Lake Macquarie, where only one pair is reported to breed. Sooty Oystercatchers can, rarely, breed on sufficiently secluded mainland headlands, but it is extremely unlikely that any of the shoreline between Nobbys Head and Burwood Beach would provide suitable conditions. A population of as many as 23 Sooty Oystercatchers has been recorded on the Central Coast (A. Morris pers. comm.). It is not known if this is an entirely separate population to the Newcastle/Lake Macquarie population, or if an interchange of individuals takes place. Again only one island is located off the Central Coast, Bird Island, which is known to support one breeding pair at any one time. Three islands off Port Stephens are about twice the distance from Newcastle as Moon Island and are separated by the continuous beach of Newcastle Bight that would provide no intervening foraging opportunities for Sooty Oystercatchers. Although interchange with the Port Stephens population is possible, it is more likely that the resident Port Stephens population of 18 Sooty Oystercatchers (Stuart 2004) would have priority use of these offshore islands. A breeding pair on each of the three islands has been reported (Alan Morris pers. comm.). Broughton Island, even further north, supports at least two breeding pairs (pers. obs.). Apart from Moon Island it is unknown where Newcastle Sooty Oystercatchers, that depart in spring, might breed.

Sooty Oystercatchers appear to favour the lower, more frequently inundated parts of the rock platforms for foraging (**Figure 3**). However, they favour the higher parts of the rock platforms for roosting, which accounts for the high numbers of oystercatchers that have been observed around the Newcastle Ocean Bath, at Roosts A and B, and on the Shepherds Hill Rock Platform immediately north of Susan Gilmore Beach, at Roost D (**Figure 2**).

Grey-tailed Tattler *(Heteroscelus brevipes)* and Red-necked Stint *(Calidris ruficollis)*

Grey-tailed Tattlers and Red-necked Stints are summer migrants and both breed in the northern hemisphere. One tattler and one to five stints have been recorded only a few times on the rock platforms. However, because tattlers are cryptic and stints are both small and cryptic, they may have been under-reported, especially for the less observed Shepherds Hill Rock Platform and the southern part of the Merewether Rock Platform. As many as 21 Red-necked Stints have been observed on Big Ben Rock, an outcrop of rocks exposed at low tide off Nobbys Head. These shorebirds are protected under the Bonn Convention and international agreements with the governments of Japan (JAMBA) and China (CAMBA).

Ruddy Turnstone *(Arenaria interpres)*

Ruddy Turnstones are uncommon summer migrants that breed in the northern hemisphere (**Figure 10**). In some years, as many as seven turnstones have been recorded over-wintering on the Newcastle Rock Platform. Turnstones are regularly recorded during summer with rarely as many as 40 to 50 Ruddy Turnstones observed on the Newcastle Rock Platform and more than 20 observed on the adjacent Newcastle and Nobbys Beaches. The relatively large number of more than 50 turnstones, reported at Newcastle Ocean Baths in April 1994, were probably on passage to their northern hemisphere breeding grounds as

March/April is the usual departure period for migratory waders from the Hunter Estuary. This emphasizes the importance of Newcastle Ocean Baths roost as a stopover for the smaller migratory waders traveling northwards in autumn and perhaps southwards in spring. Ruddy Turnstones are protected under the Bonn Convention and international agreements with the governments of Japan (JAMBA) and China (CAMBA).

Cormorants

Little Pied Cormorant *(Phalacrocorax melanoleucos),* Little Black Cormorant (*Phalacrocorax sulcirostris)* and Great Cormorant (*Phalacrocorax carbo)* are common residents. They have been reported on the rock platforms in maximum numbers of only 2, 4 and 12 respectively. They breed away from the coast in a number of the Lower Hunter Region wetlands. They use rock platforms as temporary roosts to dry their feathers and rest between offshore fishing dives. Great Cormorants were mostly observed roosting on power poles and light poles immediately above and behind the rock platforms and beaches (**Figure 11**). During the surveys, only one Great Cormorant was observed to roost directly on the rock platform. Pied Cormorants (*Phalacrocorax varius)* are regarded as usual residents in the Hunter Region. Between 6 and 20 Pied Cormorants have been recorded, mainly on surrounding beaches rather than on the rock platforms. Like other cormorants they nest in wetlands inland from the coastline.

Eastern Reef Egret *(Egretta sacra)*

One, and sometimes two, dark-phase Eastern Reef Egrets have been observed on the rock platforms. They are regarded as rare in southeastern Australia and are not known to breed in the Newcastle area, but have been reported breeding on Moon Island, off Lake Macquarie (A. Morris pers. comm.).

White-faced Heron *(Egretta novaehollandiae)*

White-faced Herons are common residents in the Hunter Region, but only single birds are recorded on the rock platforms. A maximum of three birds have been observed foraging at any one time along the entire length of the rock platforms. They nest away from the immediate coast.

Nankeen Kestrel *(Falco cenchroides)*

Nankeen Kestrels are usual residents in the Hunter Region and, although not strictly a rock-platform frequenting bird, are the only birds that have been noted to breed in the vicinity of the rock platform, specifically on cliffs immediately above the Shepherds Hill Rock Platform. T. Clarke (pers. comm. 2005) observed a pair of Nankeen Kestrels nesting on cliffs between Bar Beach and Susan Gilmore Beach. Evidence for roosting and a possible nest site was also identified during this study along the Shepherds Hill Rock Platform, about 200m north of Susan Gilmore Beach. As this is within half a kilometre of the previously observed nesting location, it indicates a degree of site faithfulness.

White-bellied Sea-Eagle *(Haliaeetus leucogaster)*

Although White-bellied Sea-Eagles are not specifically rock-platform dependant birds they do overfly the shoreline searching for fish and predating on birds that use the rock platforms. One, and probably two, Sooty Oystercatchers have been taken by sea eagles recently (Judi Thomas pers. comm. 2007).

Habitat Use

Most birds encountered on the Newcastle rock platforms use them for roosting. There are, in fact, few species that actually rely predominantly on the rock platforms for food. The Sooty Oystercatcher is the main foraging species present all year round whereas the migratory Ruddy Turnstones forage only during summer (occasionally one or two birds over-winter). Other foraging species, such as Eastern Reef Egret and White-faced Heron, were usually recorded as single birds. Although large numbers of Silver Gulls were recorded, only a few foraged specifically on the rock platform. Australian Pelicans did not directly forage on the rock platform, but instead waited on scraps from fishermen and, on calm days, swam off the rocks (**Figure 4**).

The most significant and regularly used roost site is located on the Newcastle Rock Platform on the seaward side of Newcastle Ocean Baths, at Roost A (**Figures 2** & **7**). In addition to hundreds of Silver Gulls and Crested Terns, small numbers of Sooty Oystercatchers, Ruddy Turnstones, Little Terns, Common Terns and White-fronted Terns also roost there. Additional roosting areas are located between Newcastle Ocean Baths and Canoe Pool (Roost B) and in Canoe Pool (Roost C, gulls and terns only) (**Figure 2**). Other regularly used roost sites for gulls and terns are located on the Merewether Rock Platform between

Merewether Ocean Baths and Ladies Baths (Roost E), and immediately north of Burwood Beach (Roost F, **Figure 2**). Another significant roost site, for Sooty Oystercatchers only, is located on the Shepherds Hill Rock Platform, between Strzelecki Lookout and Susan Gilmore Beach (Roost D, **Figure 2**), where as many as 14 Sooty Oystercatchers have been observed.

During surveys for this study, the most consistently utilized low-tide foraging area for all birds, particularly Sooty Oystercatchers, was located on the Newcastle Rock Platform between the Cowrie Hole and Soldiers Baths (**Figure 3**). In addition, previous observations and observations during this study indicate that Ruddy Turnstones forage consistently along the seaward edge of the rock platform adjacent to the Newcastle Ocean Baths. During this study, specific areas of the Shepherds Hill and Merewether Rock Platforms were observed as important low-tide foraging areas, but only for Sooty Oystercatchers (**Figure 3**).

Historical Bird Diversity and Abundance

Eighteen species of rock-platform frequenting birds have been recorded on the rock platforms since records began in 1972 (**Table 2**). Note that numbers included are derived from the maximum number for each species from a combination of historical and recent data. Although listed, White-winged Black Terns and a Pacific Gull are not considered in the assessment of rock platform bird diversity as they were observed flying over, not on, the rock platform. A maximum of 18 species that may be present during summer reduces to a maximum of 12 species during winter after most migratory birds have departed. Silver Gulls (605) and Crested Terns (232) are the most abundant species on the rock platforms. However, because they are common birds they have not been counted systematically in the past. Therefore, the maximum numbers, shown in **Table 2**, were recorded only recently during the six days of observations for this study. As many as 17 White-fronted Terns have been recorded during winter, but not at all in summer. Historically, more than 250 Common Terns and more than 30 Caspian Terns have been observed during summer, but their occurrence is sporadic.

Only two non-breeding Ruddy Turnstones have been recorded to over-winter on the rock platforms, however seven have been observed near Stony Point, immediately inside the entrance to Newcastle Harbour. More than 50 have been observed on the rock platforms during summer. Low numbers of infrequently recorded and cryptic migratory waders observed on the Newcastle Rock Platform, such as Red-necked Stints and Grey-tailed Tattlers, might be more commonly recorded if the rock platforms were monitored more regularly.

A combination of historical and recent observations indicate that Sooty Oystercatchers are present in maximum numbers from mid-summer to early winter, decreasing to a minimum during spring before increasing again (**Figure 12**). Although a maximum of 16 Sooty Oystercatchers was recorded during the six days of observations, as many as 26 Sooty Oystercatchers were recorded later, during March 2006 (J. Thomas pers. comm.). Sooty Oystercatchers appear to be increasing in numbers since historical records began (**Figure 13**).

DISCUSSION

In addition to seasonal influences it is evident that weather affects the diversity and abundance of birds using the rock platforms. Both diversity and abundance were considerably lower following a period of strong winds when heavy seas were sweeping over the platforms. Diversity and abundance were also influenced by birds moving to adjacent habitats. Some Sooty Oystercatchers moved off the rock platforms into the Hunter Estuary to roost on the Kooragang Dykes at high tide and, at low tide, a few foraged on oyster-banks off Stockton Sandspit, north of Stockton Bridge and along the Hunter River foreshore at Stony Point (**Figure 1**). In addition, eight Sooty Oystercatchers were observed flying to Big Ben Rock, emergent rocks off Nobbys Head (part of Nobbys Reef), where it is quite likely they would forage as well as roost. Ruddy Turnstones have also been observed roosting on the Kooragang Dykes, the Hunter River shoreline off Stockton, at Stony Point and on Big Ben Rock (**Figure 1**).

It is evident that each year the numbers of Sooty Oystercatchers decline from July to October before gradually increasing to maximum numbers from January to June (**Figure 13**). This trend may indicate that mature breeding birds leave the rock platforms about August/September to breed on offshore islands (e.g. Moon Island, etc.). After breeding they return during mid-summer with their fledged offspring to join immature or non-breeding

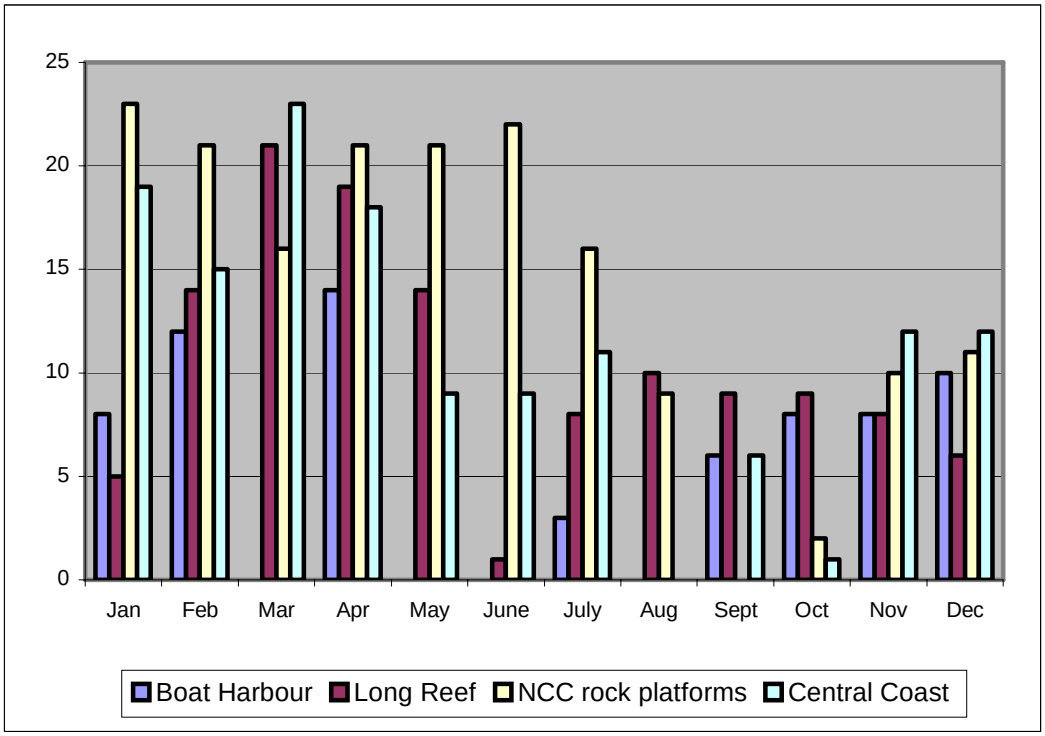

Figure 12. Similar trends of abundance variation throughout the year are shown by maximum monthly counts of Sooty Oystercatchers from Boat Harbour (Kurnell, 1995-2003, B. Speechley pers. comm.), Long Reef (Narrabeen, 1995-1998, P. Straw pers. comm.), Newcastle rock platforms (NCC rock platforms, 1985-2005, HBOC data) and the Central Coast (1995-2003, A. Morris pers. comm.).

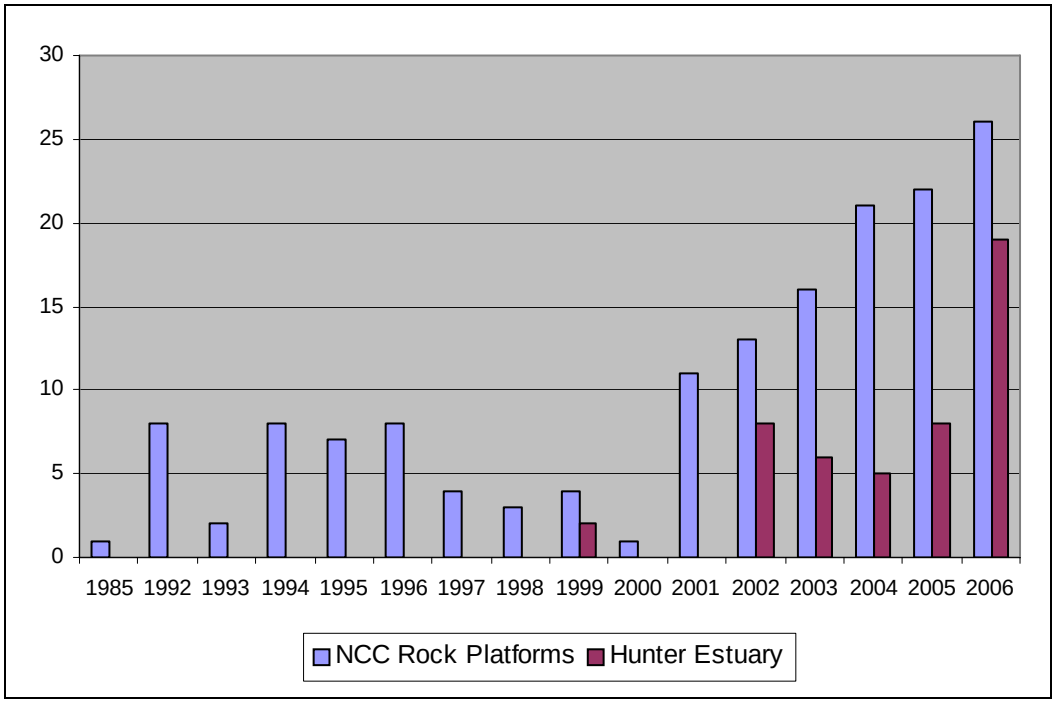

Figure 13. A comparison of maximum yearly counts since 1985 indicates that Sooty Oystercatchers appear to be increasing in numbers on the Newcastle rock platforms (NCC Rock Platforms) and in the Hunter Estuary (monitoring commenced 1999).

adults that have remained on the mainland rock platforms. Similar trends have also been observed in Victoria where numbers increase from April to peak in July/August, and also in Tasmania where birds move to wintering mainland sites between March and September (Marchant and Higgins 1993). It is apparent that similar movements occur much earlier at Newcastle's warmer latitude.

Differences Between Rock Platforms

There appear to be noticeable differences in the diversity and abundance of birds using different parts of the rock platforms (**Figure 4** and **Table 1**). The Newcastle Rock Platform supported about double the diversity of birds and a greater abundance of each species than Shepherds Hill or Merewether Rock Platforms. Shepherds Hill Rock Platform, although the most extensive, the most inaccessible and, therefore, the least disturbed of the three rock platforms, supported the least diversity and numbers of birds. This apparent paradox may be explained by both geographical and geological factors as discussed below.

Favourable geographical and geological features contribute to the higher diversity and abundance of birds using the Newcastle Rock Platform when compared to the more southern rock platforms. The proximity of the Newcastle Rock Platform to the Hunter Estuary enables many birds to move easily between estuarine and coastal habitats during tidal changes. The adjacent estuary also provides a convenient refuge from coastal heavy weather. The Newcastle Rock Platform is a low-lying peninsular backed by a relatively low-level hinterland. Roosting birds, therefore, have a relatively clear line-of-sight to their surroundings, allowing early detection of approaching aerial predators such as White-bellied Sea-Eagles and Peregrine Falcons. In addition the Newcastle Rock Platform, north of the Cowrie Hole, is composed of thin-bedded, fine-grained sandstone that dips gently seawards (**Figure 14**). This provides an expansive, low-lying, frequently inundated, seawards-sloping rock platform with a complex indented shoreface that supports a diverse and abundant invertebrate community, an ideal foraging habitat for rock-platform dependant birds such as Sooty Oystercatchers. This is supported by a study that concluded that the Newcastle Rock Platform had the highest diversity and abundance of marine shoreface invertebrates when compared with the other rock platforms (Gladstone 2006).

A number of negative features may account for the lack of avian diversity and abundance on the Shepherds Hill Rock Platform and most of the Merewether Rock Platform. Both rock platforms are more distant from the Hunter Estuary than the Newcastle Rock Platform and both are backed by high, vertical cliffs that impede a clear line-of-sight to approaching aerial predators. In addition, they have extensive stretches of elevated rock platform that presents a blocky, vertically jointed sandstone edge to the sea with a narrow intertidal habitat that supports fewer invertebrate biota than the Newcastle Rock Platform (**Figure 15**).

Figure 14. The Newcastle Rock Platform, between Cowrie Hole and Soldiers Baths, has a gently seaward-sloping rock platform with a gradational shoreface. The abundance and diversity of invertebrate fauna supported by this shoreface provides abundant foraging opportunities for Sooty Oystercatchers.

Figure 15. Shepherds Hill Rock Platform, below Strzelecki Lookout, showing an elevated rock platform with an abrupt, vertically jointed shoreface. The paucity of accessible invertebrate fauna here provides limited foraging opportunities for Sooty Oystercatchers.

Threatening Processes and Disturbances

People walking quietly past, rather than through, roosting birds generally produced very little direct disturbance. However, pairs and groups of people traversing the main roosting area on the seaward side of the Newcastle Ocean Baths, Roost A, repeatedly put birds to flight. The main problem is boisterous behaviour when both children and adults unthinkingly, and sometimes deliberately, walk or run straight through roosting or foraging birds instead of recognizing them and skirting around them.

Surfboard riders not only surf off Newcastle beaches but also catch waves offshore from rock platforms. To launch their boards, they often traverse the rock platform itself. A well-used launching spot exists on the Newcastle Rock Platform on the seaward side of Newcastle Ocean Baths. They pass within a few metres of Roost A, the most significant roost site along the entire Newcastle coast, often putting the birds to flight. This represents a recurring disturbance that is dependant on the level of boisterousness and the number of surfers at any one time. It is particularly a problem during school holidays and the warmer months when surfing activity increases. Repeated disturbances such as this render the area difficult for birds to roost or forage with any continuity.

When several rock fishermen occupied a length of the rock platform shoreline simultaneously, oystercatchers were often displaced and departed the area. However, in other areas oystercatchers roosted and foraged within 20m of individual fishermen who were quietly fishing or not moving directly towards the birds. In contrast, pelicans deliberately waited close to rock fishermen in the hope of obtaining fish scraps (**Figure 4**).

Off-the-leash dogs were observed on all the rock platforms and have also been observed chasing birds. All these areas were sign-posted as banning dogs.

Only one instance of disturbance by a natural predator was observed during the field study when a White-bellied Sea-Eagle flew high over the Newcastle Rock Platform. However, a sea-eagle has recently been observed capturing Sooty Oystercatchers (Judi Thomas pers. comm. 2007).

During periods of high spring tides or a combination of high tides and heavy wave action most of the rock platforms are inundated and may become untenable for any birds to roost or forage. During these periods many birds fly up the Hunter Estuary to roost at locations such as the Kooragang Dykes and Stony Point.

Because rock platforms in the Sydney region are in close proximity to a large human population they are being denuded of invertebrate biota by the removal of shellfish, crabs and sea urchins for human consumption, regardless of bag limits. This biota is vital for the survival of foraging rock platform species such as Sooty Oystercatchers, but is not vital for the survival of humans in this area and at this time in Australia. This activity is really a cultural phenomenon generally restricted to a few ethnic groups. The author is not aware of similar problems in the Newcastle area. However, if this does occur, or is allowed to happen, it would be of serious concern for the survival of rock-platform foraging birds.

Management Options and Recommendations

Newcastle's rock platforms are heavily used by humans for recreation. This is especially so for the Newcastle Rock Platform; for parts of the Shepherds Hill Rock Platform, between Bar Beach and Susan Gilmore Beach; and the Merewether Rock Platform, north of Merewether Ocean Baths. However, despite the high level of human use, these areas support a significant diversity of species and abundance of birds.

Consideration should be given to providing protection for the vulnerable Roosts A and B (**Figure 2**) on the seaward side of Newcastle Ocean Baths to prevent repeated disturbance by people walking or running through the roosting birds. Facilities to allow viewing without disturbing the birds could also be considered. At the very least it is recommended that interpretive information signs be erected at that location. These roost sites offer a spectacular display of biodiversity that is of significant educational and aesthetic value. It is a well-known birdwatching site not only for local birdwatchers but also for birdwatchers from Sydney and interstate. The lack of information signs about birds at the Newcastle Rock Platform is in stark contrast to Cairns City, which has constructed an extensive esplanade boardwalk, supported by a plethora of interpretive signs, to direct tourists to view bird life along the shoreline mudflats. This feature attracts thousands of Australian and international tourists each year. During the compilation of this report the author had the opportunity to visit the Cairns Esplanade

during July. Dozens of people were using the esplanade but, at that time of the year, there were less than a hundred birds of about half a dozen species. In comparison the Newcastle Rock Platform, visible from Shortland Esplanade and the Ocean Baths, often had many hundreds of birds totaling as many as 10 species. Displays of biodiversity and abundance such as this, in addition to the recently rehabilitated Stockton Sandspit, are spectacular, but unrealized, avian assets for ecotourism that are virtually ignored in the Hunter Region.

There is a need to educate surfers, who cross rock platforms to launch into the surf, to avoid running through roosting and foraging birds, and to skirt around them without disturbing them, particularly at the Newcastle Ocean Baths. Suitable signs should guide surfers along the edge of the rock platform behind the baths seating area so that they do not need to access the rock platform directly from the baths.

Fishermen should be educated to regard oystercatchers as they would fellow fishermen, by respecting their space, by not approaching within 25m and by walking around, not through, roosting and foraging birds. Fishermen could be recruited by informing them of the birds' vulnerable status and encouraging them to adopt the birds as a symbol of the health of the rock platform. They may adopt a sense of protection and ownership of the birds' welfare, and even discourage other people from disturbing them. Sooty Oystercatchers could be promoted as a readily recognized symbol of the health of the rock platforms.

Consideration should be given to banning the collection of shellfish, crabs and sea urchins etc. from the entire area of the Newcastle Rock Platform and from the favoured foraging areas of the Sooty Oystercatchers on the Shepherds Hill and Merewether Rock Platforms (**Figure 3**).

Even though there are adequate signs banning dogs from entry onto beaches, evidence of dogs on some beaches and rock platforms was noted. This indicates that more policing of the regulations banning dogs should be undertaken and that signs specifically banning dogs from the rock platforms are needed.

It is recommended that an education/information campaign be instigated so that the public can more fully understand the ecology of the rock platform environment, including both invertebrate and avian biota. This could be achieved through published articles, guided rock platform walks and interpretive signage in appropriate locations.

CONCLUSIONS

Because of its favourable geology, geography and invertebrate fauna the Newcastle Rock Platform has about twice the avian biodiversity of the Shepherds Hill and Merewether Rock Platforms. The Newcastle Rock Platform also hosts the greatest abundance of birds and is the location of the most significant regularly used roost on all rock platforms in the Newcastle City area. Because of the dynamic conditions on the coastal rock platforms no birds nest there. However, the Nankeen Kestrel is known to nest on cliffs immediately above the Shepherds Hill Rock Platform.

Of the 18 bird species regarded as rock platform frequenters only three species depend heavily on the rock platforms for their survival: Eastern Reef Egret, Ruddy Turnstone and Sooty Oystercatcher. Other birds, such as cormorants, gulls and terns, mostly use the rock platforms as a secure roost to rest after foraging offshore or landward. Of the hundreds of Silver Gulls present on the rock platforms only a small proportion actually forage there. Sporadic summer migrants such as Grey-tailed Tattler and Red-necked Stint probably both roost and forage when present, but were not observed during this study. The variable number and sporadic sightings of White-faced Herons indicate that the rock platforms are not their sole foraging area.

The most vulnerable and regular rock-platform dependant bird is the resident Sooty Oystercatcher, an iconic indicator of the ecological health of the area. If numbers are really increasing, as records appear to show, the few prime foraging areas in the vicinity of Newcastle become increasingly important for their survival. As harvesting of rock platform fauna for human consumption or bait is a direct threat to their existence, it has been recommended that the collection of shellfish, crabs and sea-urchins, etc., be prohibited from the entire Newcastle Rock Platform and from other prime foraging areas for Sooty Oystercatchers on the Shepherds Hill and Merewether Rock Platforms (Gladstone & Herbert 2006).

It is gratifying that Newcastle City Council is already acting on some of the recommendations presented to them by Gladstone and Herbert (2006) and reiterated above. Information signs are

presently being designed for installation at selected entry points to the rock platforms.

Meaningful decisions concerning the management of birds cannot be made without reliable data. This report, summarized from Herbert (2006a & b), has attempted to pull together historical information and generate new information. However, the total of six days of winter and summer observations provided only just enough data for tentative conclusions. On the other hand, it was surprising how much useful data was generated in such a short time, providing interesting numerical and qualitative information regarding use of the rock platforms, particularly for the resident shorebird, the Sooty Oystercatcher. Historical records for individual species have been sporadic and, except for HBOC observations, abundances have rarely been recorded. It is obvious, especially for the Shepherds Hill and Merewether Rock Platforms, that birds frequenting those rock platforms have been under-reported. Ongoing management decisions should be based on regular surveys and counts of birds using the rock platforms, in association with monitoring of threats and disturbances at various times of the year.

ACKNOWLEDGEMENTS

Many thanks to Liz Crawford for assisting the author with field observations during Days 1 to 6, and for thoroughly reviewing the draft manuscripts, while adding substantially to the content. Judith Thomas assisted in observations for Days 5 & 6. Brian Speechley and Phil Straw provided data on Boat Harbour and Long Reef, and Alan Morris provided data from the Central Coast and information regarding nesting locations. Dick Cooper provided data from the NSW Bird Atlassers and Andrew Silcocks provided data from the Birds Australia Atlas Database. Thanks to Liz Huxtable and Jenny Spencer for reviewing the manuscript and suggesting helpful improvements. Accolades to all birders who submitted their diligent observations to HBOC's database and especial thanks to Sue Hamonet who manages and retrieves the data. Thanks also to Danielle Birkbeck for facilitating the commissioning of the original report for Newcastle City Council.

REFERENCES

Gladstone, W. (2006). Intertidal biodiversity on coastal rock platforms in Newcastle. In Newcastle coastal rock platforms biodiversity and management study (Gladstone, W. and Herbert, C.) Pp. 1-83. Report for Newcastle City Council.

Gladstone, W. and Herbert, C. (2006). Newcastle coastal rock platforms biodiversity and management study. Report for Newcastle City Council.

Herbert, C. (2006a). Birds on Newcastle's Coastal Rock Platforms. In Newcastle coastal rock platforms biodiversity and management study (Gladstone, W. and Herbert, C.) Pp. 1-42. Report for Newcastle City Council.

Herbert, C. (2006b). Birds on Newcastle's Coastal Rock Platforms. Hunter Bird Observers Club Special Report No. 3.

Marchant, S. and Higgins, P. J. (1993). 'Handbook of Australian, New Zealand and Antarctic Birds' Volume 2. (Oxford University Press, Melbourne.)

Stuart, A. D. (2004). The Shorebirds of Port Stephens. Hunter Bird Observers Club Special Report No. 2.