THE SHOREBIRDS OF PORT STEPHENS

RECENT AND HISTORICAL PERSPECTIVES

A D Stuart

HBOC Special Report No. 2

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Cover Photo: Eastern Curlew *Numenius madagascariensis* (Photographer: Chris Herbert).
The Eastern Curlew is a common and abundant shorebird of Port Stephens. At least 600 birds are present each summer and many of the immature birds remain through the winter months. Port Stephens is an internationally significant habitat for the species.

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Executive Summary

It has long been known that Port Stephens in NSW is host to many species of migratory and non-migratory shorebirds. However, there seems to be no overall compilation available of all the shorebird species that occur in Port Stephens, or any consideration of what numbers of each species typically/maximally are present and what locations are of more importance to them.

The author has analysed the available data about shorebird records for Port Stephens. Early data are from opportunistic records since the early 1970's, when bird clubs or individuals visited one or more locations within Port Stephens and from a baseline study of the wader populations 1970-1990 by Smith (1991). The Smith study included Port Stephens as one of the 42 NSW coastal wetlands analysed, thus providing a comparison of its status then and now and with other wetlands. More usefully, there have also been some systematic studies undertaken – in particular, regular monthly high tide surveys of Worimi Nature Reserve that commenced in September 2000, a high tide survey of most of Port Stephens on 8 February 2004, and six Australian Wader Study Group surveys over 1982-1984.

32 species of shorebird have been recorded in Port Stephens – 22 migratory species and 10 species that are breeding residents in Australia. The total count of birds in the February 2004 systematic survey was 2,053 shorebirds (and 2,417 other waterbird species).

Shorebirds Recorded in Port Stephens

Migratory Species	**Australian Resident Species**
Black-tailed Godwit	Bush Stone-curlew
Bar-tailed Godwit	Pied Oystercatcher
Whimbrel	Sooty Oystercatcher
Eastern Curlew	Black-winged Stilt
Marsh Sandpiper	Banded Stilt
Common Greenshank	Red-necked Avocet
Wood Sandpiper	Red-capped Plover
Terek Sandpiper	Black-fronted Dotterel
Common Sandpiper	Red-kneed Dotterel
Grey-tailed Tattler	Masked Lapwing
Ruddy Turnstone	
Red Knot	
Sanderling	
Red-necked Stint	
Pectoral Sandpiper	
Sharp-tailed Sandpiper	
Curlew Sandpiper	
Pacific Golden Plover	
Grey Plover	
Double-banded Plover	
Greater Sand Plover	
Lesser Sand Plover	

As a result of his 1970-1990 investigation, Smith (1991) classified Port Stephens as a Category 2 Priority wetland, because it supported 3 species with more than 1% of the Australian population. The Hunter Estuary was his only Category 1 Priority, supporting 16

species with counts above the 1% level. In 2004, Port Stephens remains a waterbird habitat of special conservation significance. It is particularly important all year round for the larger species of shorebird – godwits, curlews, whimbrels. A significant proportion (at least 1.7%) of the total world population of Eastern Curlew apparently are present each summer in Port Stephens. The February 2004 survey found 112 Pied Oystercatcher to be present – this again is a significant proportion (1.0%) of the estimated total population. It is a very significant proportion of the NSW population which has previously been estimated at 250 birds (the estimate may need to be revised).

Port Stephens is also important for some small shorebirds. Far more Double-banded Plover occur there in winter than do in the Hunter River Estuary. Counts of Red-capped Plover and Red-necked Stint seem generally to be comparable to those for the Estuary.

In contrast, there are very few Port Stephens records for medium sized migratory shorebirds. However, winter records of such species seem to occur fairly frequently (not in large numbers but it should be noted that there has been no systematic attempt to quantify the winter counts). Thus, Port Stephens may be important for the immature birds that do not return to the northern hemisphere breeding grounds.

Considering all birds not just shorebirds, two species classified as Endangered under the NSW Threatened Species Conservation Act, eight species classified as Vulnerable in NSW, and 15 species that have been classified by others as Near-threatened, are known to have been recorded around Port Stephens. For these species, and especially for those that already are classified as Endangered or Vulnerable, it is important that appropriate management plans are in place for them in Port Stephens.

Species Recorded in Port Stephens Listed under the NSW TSC Act

Endangered	Bush Stone-curlew
	Little Tern
Vulnerable	Osprey
	Black-tailed Godwit
	Terek Sandpiper
	Pied Oystercatcher
	Sooty Oystercatcher
	Greater Sand Plover
	Lesser Sand Plover
	Sanderling

A series of recommendations is made in this report. These largely relate to the need for additional systematic surveys of Port Stephens to better understand its significance for shorebirds. To date, there has been only one systematic survey of all of Port Stephens. The recommendations (discussed in more detail in the main body of the report) are as follows:

1. Regular summer high tide surveys be undertaken for several more years.
2. A winter high tide survey should be undertaken, with a similar format to the summer surveys.
3. Continue to use a water-based survey technique for the summer and winter high tide surveys.

4. Local Management Plans for the NSW Endangered and Vulnerable species identified as utilising Port Stephens be reviewed, or developed if they do not already exist.
5. Structures such as oyster leases and emergent posts should be retained at least until it becomes clear that alternative roosting options are available for the birds.
6. Consideration be given to how a systematic low tide survey in summer could be conducted.
7. Consideration should also be given to conducting a high tide survey in spring (targeting the period around late September or early October when birds are on migration passage).
8. Consideration be given to how the nocturnal high tide roost sites for the shorebirds could be identified.
9. Consideration be given to conducting a study to identify if there is any movement of birds between Port Stephens and other feeding or roosting areas, especially exchanges with the Ramsar site in the Hunter Estuary.

1. Introduction

This report has been produced by Hunter Bird Observers Club Inc (HBOC) at the suggestion of NSW National Parks and Wildlife Service, Hunter Region. It is focussed on the utilisation by shorebirds of the Port Stephens habitat. The main objectives in producing the report were to collate the known records of shorebirds in Port Stephens, to define the status in Port Stephens for each of the shorebird species, to compare shorebird utilisation of Port Stephens with that for the better-known Hunter River Estuary, and to recommend appropriate actions that would improve the understandings of how shorebirds utilise Port Stephens and how to protect their habitat.

The report is based on data collected from many sources, and in particular the following:

- Regular monthly high tide surveys of Swan Bay (Worimi Nature Reserve) that commenced in September 2000. Swan Bay is well known as an important Port Stephens high tide roost site for shorebirds;
- A high tide survey by HBOC in February 2004, done with assistance by NPWS Hunter Region and NSW Waterways. The survey was targeted at shorebirds although much valuable data about waterbirds generally in Port Stephens was also obtained and is reported here;
- Annual Hunter Region Bird Reports, published by HBOC since 1993;
- Annual NSW Bird Reports, published by Birding NSW (formerly NSW Field Ornithologists Club) since 1971;
- A paper describing an ebb tide survey of northern Port Stephens in 1979/80;
- A resource survey completed in 1980 in relation to a proposed nature reserve within Port Stephens (the Pipeclay Creek N.R.);
- A 1991 report for NSW National Parks & Wildlife Service on the biology and management of waders;
- Data from Australasian Wader Study Group surveys over 1982-1984; and
- Shorebird data from field excursions by HBOC and individual Club members to the Port Stephens area between 1980 and 2002.

In the subsequent sections of this report, data from each of the above sources are presented and discussed. Finally, an overview is presented and the significance of the Port Stephens shorebird habitat and records is compared to the Hunter River Estuary.

Some of the above surveys definitely were done during times of high tide – these are the Worimi Nature reserve surveys, the 8 February Port Stephens survey and the 1982-84 AWSG surveys. For the other data it generally was not noted what the tide situation was at the time of the observation.

Shorebirds, also known as wading birds or waders, are defined here as birds that are ecologically dependent on the habitat at the shores of oceans, lakes and rivers. Many of them utilise tidal bodies of water; and in such cases, the typical behaviour is for the birds to feed on exposed sand or mudflats whilst tidal conditions permit, then to rest ("roost") on slightly higher ground during high tides. Often they roost communally. Counts of shorebird numbers are best made during times of high tide, when the birds are gathered into relatively few locations. At other times, they are widely dispersed including into areas that can be less readily accessible (for example, because of shallow mudflats).

Many shorebirds are migratory, with the adult birds travelling annually between Australia and their northern hemisphere breeding grounds. The immature birds generally remain, although it is emerging that many may make a partial migration to northern Australia in winter. Several other shorebird species are resident in Australia.

Hunter Bird Observers Club

HBOC is an active club comprising around 250 members. It was formed in 1976, and has the objectives:

- To further and study the conservation of Australian birds and their habitat
- To encourage bird watching as a leisure time activity

In achieving its objectives, HBOC conducts numerous surveys within the Hunter Region, and publishes the results of them in its annual Bird Reports and in other appropriate forums. Shorebird monitoring in the Hunter Region has been and continues to be an important component of HBOC's surveys.

Since April 1999, HBOC has been conducting monthly high tide surveys of the shorebirds in the Hunter River Estuary, which is well known as the most important shorebird habitat in NSW. This report will show that Port Stephens is also a significant NSW habitat for large migratory shorebirds such as curlew and godwits. Two shorebird species have >1% of their population present in Port Stephens in summer, making it a significant location for them. Historically, additional species have also been present at >1% level. Ten bird species that are listed under the NSW Threatened Species Conservation Act are known to have been recorded in Port Stephens.

2. High Tide Surveys at Swan Bay (Worimi Nature Reserve)

2.1. Summary

Up until February 2004, 38 monthly surveys have been conducted at Swan Bay, focussed onto the area that is now known as Worimi Nature Reserve. The survey period commenced September 2000 and the period up to February 2004 is covered in this report. 24 of the surveys have been for the months of September-February (named as "summer" for the purposes of this report). These months correspond to the main time that migratory shorebirds are present locally (most birds depart at some time in March and arrive in early September). All of the summer months since September 2000 have been surveyed. Over the same period, 14 of the possible 18 "winter" months (March-August) have been surveyed.

In the analysis presented below, the surveys are considered in terms of the "summer" (September-February) and "winter" (March-August) records. Although a slightly simplistic grouping, this gives a reasonable indication of the adult birds that come here in the non-breeding season and of the immature birds that do not need to return north to breed.

So far, 21 species of shorebird have been recorded at the Swan Bay site (14 of these being migratory species). Detailed count data are provided in Tables 1-4 further below. A summary for each species is as follows:

Bar-tailed Godwit: Birds have been recorded every month. Typically, 50-100 birds are present in the winter months, with the counts rising to 300-400 birds some months during the non-breeding season. It seems clear that the birds also use other high tide roost sites, since the counts vary considerably. Also, the numbers peak in September or October each year suggesting that some birds utilise the area while on passage migration.

Whimbrel: Some birds have been present in ~65% of the surveys to date (and have been as likely to be present in March-August as in September-February). Generally, they have been in low numbers (1-3 birds, occasionally 5-8 birds). The peak count has been of 12 birds present on 1 May 2001. Whimbrel are known to prefer to roost in mangrove areas, which is not a major habitat at Worimi N.R. The majority of the records relate to birds that were roosting on exposed oyster poles just off shore.

Eastern Curlew: Several hundred birds roost regularly at Worimi N.R. during the non-breeding season. The peak count is of 430 birds in February 2002. The numbers have declined to <300 birds in the two subsequent seasons and it will be of interest to watch if this is a temporary or permanent change. The winter counts have been quite variable, and have peaked at 88 birds in June 2001.

In the 4 years of monitoring, the numbers over the September-February period have averaged 317 birds present (standard deviation = 87). This compares very favourably with the 300-400 birds generally present in the Hunter River Estuary over the corresponding times (some of the counts have been greater).

Common Greenshank: Single birds have been present on 4 of the 38 surveys to date, in the summer months. This may be compared to counts of 50-100+ birds frequently recorded in the Hunter River Estuary in the summer months.

Grey-tailed Tattler: Some birds have been present in ~55% of the surveys to date. They have been more often present in the March-August period (present in 86% of surveys). The counts vary considerably, often being of <10 birds but peaking at 37 birds in October 2000 and on several other occasions being of 20-30 birds. March-April and September-October are when the highest counts generally occur, suggesting that some birds utilise the area while on passage migration.

Ruddy Turnstone: To date there is only one record – of a single bird present in June 2003. This is an uncommon and hence interesting winter record of the species in the Hunter Region.

Red Knot: Birds have been recorded on 4 of the surveys, with 3 of these being in September or October when birds are on migration passage (mostly heading for NZ). The peak count was of 12 birds in October 2000. This may be compared with typical counts of >1000 birds in the Hunter Estuary in the same months. Clearly, if the species utilises the Port Stephens area as a staging area during migration, the birds roost elsewhere than Worimi N.R.

Red-necked Stint: Birds have been present in 33% of the September-February surveys and 50% of the March-August surveys. The peak summer time count of 53 birds in January 2002 is considered quite significant for NSW and may be compared to counts of 50-150 birds in the Hunter River Estuary in recent years. The over-wintering birds are also significant records – in contrast, the species is usually absent from the Estuary in winter.

Pectoral Sandpiper: Although there has only been one record of this species over the 4 year period, it is a significant one. Four birds were present in December 2001. The species is considered rare in the Hunter Region, with infrequent reports occurring and mostly these being of single birds.

Sharp-tailed Sandpiper: There have been 5 records of Sharp-tailed Sandpiper to date (present on ~12% of surveys). All of the records have been in the non-breeding (summer) season – this is in common with the general pattern for the Hunter Region where there are very few winter records. The peak count was of 22 birds in March 2003. There were no other records in 2003 and the March birds may have been on northern migration passage.

In the same 4 year period in the Hunter River Estuary, there were many records of 1000+ birds. Thus, Worimi N.R. probably is not a highly significant roost area for Sharp-tailed Sandpiper; however its role as a staging area in the migration season warrants further investigation.

Curlew Sandpiper: To date there is only one record – of a single bird present in February 2002. This may be compared with frequent September-February records of many hundreds of birds in the Hunter River Estuary in the same period.

Pied Oystercatcher: Birds have been recorded on 58% of the September-February surveys and 86% of the March-August surveys (68% of overall surveys). Most records have been of 1-5 birds, and the peak count is of 13 birds in August 2001 (also 2 other records of >5 birds in 2001). It is uncertain whether these birds are breeding adults or immature birds. Pied Oystercatcher do not usually breed until at least 4 years of age. Breeding adults would be expected to be site faithful during summer months.

Sooty Oystercatcher: There have been 7 records to date of this species at Worimi N.R., in the 38 surveys conducted. A notable record is of 8 birds present in August 2002. The Sooty Oystercatcher is classified as Vulnerable under the NSW Threatened Species Act and thus the Worimi records are significant, and particularly the latter one. Sooty Oystercatcher breed almost exclusively on off-shore rocks and islands. Birds occurring at Worimi N.R. are expected to be immatures, and areas like the Nature Reserve are important for ensuring their survival to maturity.

Black-winged Stilt: To date, there has only been one record of this species in the 4 years – when a single bird was present in January 2001. In the Hunter River Estuary, this species is generally present in counts of many hundreds of birds except when inland conditions are favourable.

Banded Stilt: Since the surveys commenced, there have been two records of the species at Worimi N.R. – single birds present in September 2000 and January 2001. The Banded Stilt is a rare visitor to the Hunter Region, and there have only been two additional records for the Region during the period in question. In times of drought inland, birds disperse widely including to coastal wetlands which therefore are an important refuge for the species.

Pacific Golden Plover: Birds have been present in 47% of the surveys (9 summer and 9 winter records), mostly as 1-10 birds. However, 29-30 birds were present during January and February 2003, and 18 birds in July 2003. These are significant records. The summer counts are comparable to many of the recent counts in the Hunter River Estuary (which, however, occasionally has counts of >100 birds). The winter records also are significant since birds are generally absent from the Hunter River Estuary in winter.

Red-capped Plover: This Australian resident species has been present in ~65% of the surveys, and consistently so throughout the year. The counts vary considerably, presumably in response to changing conditions at the Nature Reserve and/or in Port Stephens generally. The peak count is 54 birds present in April 2001, and there have been 6 other records of >15 birds. A pair were breeding (nest with eggs) at the Nature Reserve in October 2000.

Double-banded Plover: This species is known as a winter migrant from New Zealand, and is considered to be in decline in the Hunter River Estuary. There have been 8 winter records at Worimi, with an average count of 21 birds when present and peak count of 28 birds (in August 2003). Thus, the Nature Reserve is a significant Hunter Region site for the species. There is one summer record – of a single and presumably late departing bird present in September 2002.

Lesser Sand Plover: There have been 9 records over the survey period, mostly of 1-5 birds, however, 7 birds were present in November 2001 and 22 birds in January 2001. In comparison, there have been only 3 records for the species in the Hunter River Estuary in the corresponding period with the peak count being of 4 birds. The species is considered near extinct in the Estuary (where records from around 20 years ago were of 800 birds). Thus the Worimi records are very significant for the region. This includes the 5 winter records of 1-2 birds – there are no other known winter records from the Hunter Region.

Black-fronted Dotterel: To date there is only one record – of a single bird present in June 2001. This Australian and Hunter Region resident shorebird is not limited to tidal habitats for feeding and therefore does not have the same type of roosting behaviour that many other shorebirds have. It is more usual for it to occur in freshwater and lagoon rather than tidal habitats.

Masked Lapwing: Small numbers of birds have been present in 87% of the surveys, including in every one of the winter (March-August) surveys. The peak count has been of 6 birds. This a relatively low count for a species that is a widespread and common Hunter region resident but it more usually occurs in freshwater rather than tidal habitats.

Table 1 Shorebird Records at Swan Bay (Worimi N.R.)
September 2000 – February 2004

Species	Sep-Feb period (24 surveys)		Mar-Aug period (14 surveys)	
	# of surveys present (%)	Peak Count	# of surveys present (%)	Peak Count
Bar-tailed Godwit	24 (100%)	~500	14 (100%)	~300
Whimbrel	15 (63%)	5	9 (64%)	12
Eastern Curlew	24 (100%)	430	13 (93%)	410
Common Greenshank	2 (8%)	1	2 (14%)	1
Grey-tailed Tattler	8 (33%)	~37	12 (86%)	28
Red Knot	4 (17%)	12	0 (0%)	-
Red-necked Stint	8 (33%)	53	7 (50%)	19
Ruddy Turnstone	0 (0%)	-	1 (7%)	1
Pectoral Sandpiper	1 (4%)	4	0 (0%)	-
Sharp-tailed Sandpiper	4 (16%)	18	1 (7%)	22
Curlew Sandpiper	1 (4%)	1	0 (0%)	-
Pied Oystercatcher	14 (58%)	10	12 (86%)	13
Sooty Oystercatcher	3 (12%)	2	4 (29%)	8
Black-winged Stilt	1 (4%)	1	0 (0%)	-
Banded Stilt	2 (8%)	1	0 (0%)	-
Pacific Golden Plover	9 (37%)	30	9 (64%)	8
Red-capped Plover	15 (63%)	18	10 (71%)	54
Double-banded Plover	1 (4%)	1	8 (57%)	28
Lesser Sand Plover	4 (16%)	22	5 (36%)	3
Black-fronted Dotterel	0 (0%)	-	1 (7%)	1
Masked Lapwing	19 (79%)	6	14 (100%)	4

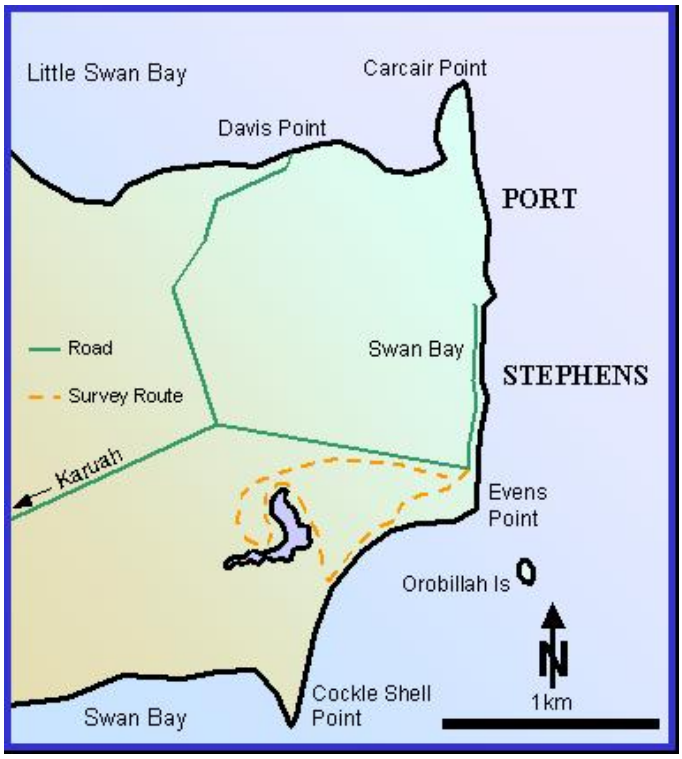
2.2. Survey Methodology

The surveys have been made around the time of the peak high tide, when shorebirds generally could be expected to be roosting. Most surveys were made concurrently with the monthly surveys by HBOC of the Hunter River Estuary, or at least on the same weekend. The prime objective has been to track the numbers of shorebird species using the high tide roost in the area now designated as Worimi Nature Reserve. However, all the shorebirds seen during each overall expedition were recorded. Sue Hamonet led every survey, accompanied by 1-2 other HBOC members. The consistent leadership ensured that a consistent methodology was followed for each survey, to the extent that conditions permitted.

The counts have been done by land and are taken after traversing the extensive area of samphire mud flats that lie at the Southern end of the township of Swan Bay. Figure 1 shows the positioning and course taken for these surveys. Depending on the conditions, and the number of birds to be counted, the surveys have taken 2-4 hours to complete.

Since the surveys are undertaken on foot, there have been times when the observers have been unable to negotiate the mudflats due to exceptionally high tides, which prevent crossing the main channel which intersects the area. At these times the count of Eastern Curlew is an estimate, and is indicated on the later tables by symbol ~.

Figure 1 Survey Route at Worimi Nature Reserve



2.3. Discussion

Counts have been influenced by various factors – including the height of the high tide, the degree of dryness of the mud flats, the presence or absence of water in shallow ponds or lagoons on the mud flats and the wind strength.

The two most predominant and regularly occurring species at the Nature Reserve at high tide are Eastern Curlew and Bar-tailed Godwit. Eastern Curlews may sometimes be found standing in water in the main lagoon, sometimes on the mudflats at the northern edge of the lagoon when shallow pools of water are present, and into the fringing mangroves. At times of strong wind they take refuge on the southern side of the main lagoon where there is more shelter from mangroves. Bar-tailed Godwits are not as predictable in behaviour. At times, large numbers of the species gather with the Curlews, but at other times they prefer the beachfront. Significant numbers also roost on the exposed oyster poles some 150m east of the main lagoon area where they wait until the tide begins to turn before moving out to feeding spots. Others appear to gather at the northern end of the small island, known by locals as Pelican Island, but shown on the Karuah topographical map as Orobillah Island. A rocky platform is visible from the shore where Godwit can be seen to congregate. Pied and sometimes Sooty Oystercatcher also roost at this site. At times of very high tide, when the

rocks are covered, large flocks of Godwit have been seen on the wing, appearing to come from the direction of the seaward side of Snapper Island.

The surveys show that at times significant numbers of small shorebirds can be present, mainly Plovers or Stints and Sharp-tailed Sandpipers. The presence of the small waders very much depends on the degree of dryness of the mudflats while the Sharp-tailed Sandpipers use the shallow edges of the lagoon, sheltering among the mangroves. Lesser Sand Plover, Red-necked Stint and perhaps also Double-banded Plover seem to use Worimi N.R. site as a feeding ground, rather than a roosting site. They are absent from the site when the area is completely dry.

The winter surveys reveal significant numbers of Double-banded Plovers using the mudflats and samphire area, and feeding at low tide at the waterfront. Worimi N.R. is an important site for this species, the numbers of which have declined alarmingly in the Hunter Estuary over the last ten or so years.

At the turn of the tide the shorebirds appear to spread out to various locations. The waterfront area of Swan Bay is an important feeding site as the tide recedes revealing a muddy substrate.

The exposed oyster poles, as previously mentioned, are used regularly – in summer and winter by Godwits, and at varying times by Grey-tailed Tattlers and the occasional Whimbrel. This indicates the importance of retaining these structures even if the oyster leases are lapsed.

2.4. Acknowledgements

Special thanks go to Sue Hamonet who has led all the Swan Bay/Worimi surveys and who provided a write-up that has formed the basis for this section of the report. Many thanks also to the several members of HBOC who have participated in one or more of the surveys to date.

Table 2 Shorebird Records at Swan Bay (Worimi N.R.)
September 2000 – December 2001

	2000				2001										
	16 Sep	15 Oct	11 Nov	9 Dec	20 Jan	24 Feb	22 Apr	1 May	24 Jun	21 Jul	20 Aug	22 Sep	20 Oct	17 Nov	16 Dec
Bar-tailed Godwit	20	250	60	72	149	55	57	87	40	~300	~300	~500	>300	89	101
Whimbrel	2	1			5	2		12	8	4	5	1		4	1
Eastern Curlew	406	~340	310	385	218	238	170	117	88	205	410	400+	>400	426	333
Common Greenshank				1		1									
Grey-tailed Tattler		~37			3				16	26	27			13	14
Ruddy Turnstone															
Red Knot	9	12		4											
Red-necked Stint			9					1		2				3	
Pectoral Sandpiper															4
Sharp-tailed Sandpiper															
Curlew Sandpiper															
Pied Oystercatcher						3		2	2	3	13	8	2	2	10
Sooty Oystercatcher									1			2			
Black-winged Stilt					1										
Banded Stilt	1				1										
Pacific Golden Plover		1						2	1	1	1	1	1	7	
Red-capped Plover		2 ne	8	3	2		54	10	8		1	16		26	
Double-banded Plover								22	18	19					
Lesser Sand Plover		1			22			1	2	2				7	
Black-fronted Dotterel									1						
Masked Lapwing	3	1	1			2		2	4	3	4	2	2	6	>5

Table 3 Shorebird Records at Swan Bay (Worimi N.R.)
January 2002 – December 2002

	2002										
	12 Jan	17 Feb	16 Mar	13 Apr	12 May	13 Jul	10 Aug	21 Sep	19 Oct	16 Nov	15 Dec
Bar-tailed Godwit	112	61	78	19	19	60	22	30	40	68	~78
Whimbrel	1		2	1			1	2	2	3	1
Eastern Curlew	400	430	69	20	23	58	244	172	320	~400	~210
Common Greenshank			1								
Grey-tailed Tattler		1	28	14	1	4	4	8		4	1
Ruddy Turnstone											
Red Knot								2			
Red-necked Stint	53	23		2		7				11	10
Red Knot								2			
Pectoral Sandpiper											
Sharp-tailed Sandpiper								4		2	11
Curlew Sandpiper		1									
Pied Oystercatcher	1	7	2	4		3	2	2		2	2
Sooty Oystercatcher							8				1
Black-winged Stilt											
Banded Stilt											
Pacific Golden Plover	21			8	2	2	2	5		6	
Red-capped Plover	6	18		20+	2	13		2	1	12	
Double-banded Plover				21	15	20		1			
Lesser Sand Plover				2							
Black-fronted Dotterel											
Masked Lapwing	2	2	4	4	4	2	<5	<5	2	2	3

Table 4 Shorebird Records at Swan Bay (Worimi N.R.)
January 2003 – February 2004

	2003										2004	
	18 Jan	15 Feb	15 Mar	14 Jun	12 Jul	16 Aug	12 Sep	11 Oct	9 Nov	13 Dec	19 Jan	7 Feb
Bar-tailed Godwit	68	50	30+	80	61	66	~150	60+	79	32	53	55
Whimbrel	1		2		2		5					1
Eastern Curlew	250	240	104	31		261	~250	260+	~311	~310	~280	273
Common Greenshank			1									
Grey-tailed Tattler			10	14	7	5	29					
Ruddy Turnstone				1								
Red Knot												
Red-necked Stint		18	19	nil	4	11					38+	
Pectoral Sandpiper												
Sharp-tailed Sandpiper			22								18	
Curlew Sandpiper												
Pied Oystercatcher		2	3	4	2	2				1	4	3
Sooty Oystercatcher					2	1		2				
Black-winged Stilt												
Banded Stilt												
Pacific Golden Plover	30	29			1							
Red-capped Plover	11	13	20		18	5		3			1	
Double-banded Plover					26	28						
Lesser Sand Plover	1		3								2	>5
Black-fronted Dotterel												
Masked Lapwing	<5	2	2	4	4	<5	4		2	2		

3. Port Stephens High Tide Survey 8 February 2004

3.1. Summary

On 8 February 2004 a survey of waterbirds in Port Stephens was organised in which five sub-areas were visited simultaneously by 13 members of Hunter Bird Observers Club with the assistance of NSW NPWS and NSW Waterways. The survey was focussed on obtaining counts of waterbirds utilising the surveyed area, and on identifying the more important sites where they were found. The definition of a waterbird is that used by Delany & Scott (2002):

"birds that are ecologically dependent on wetlands"

Thus, shorebirds, gulls and terns, cormorants, pelicans, egrets and herons, ducks and so on, are collectively grouped as waterbirds.

In particular, the survey concentrated on identifying the important shorebird roost sites around Port Stephens and in making a count of the total numbers of the various shorebird species that were present.

Figure 2 is from an aerial photograph of Port Stephens, with the area targeted for the February 2004 survey indicated. The five surveyed Port Stephens areas, shown in Figure 3, were in the northern and NW to SW areas which are less settled parts of the Port, where waterbirds generally, and shorebirds in particular, were considered more likely to be present. The usual absence of shorebirds from the southern and NE parts of Port Stephens, due presumably to the high population density and shoreline utilisation, is well known to HBOC.

Descriptively, the five areas of the survey were:

- Area A: Jimmy's Beach to Boondabah Island
- Area B: Fame Cove to Wirrung Island via Karuah
- Area C: Snapper Island to Little Swan Bay
- Area D: Bull Island to Swan Bay via Tanilba Bay and Oyster Cove
- Area E: Tilligerry Creek

Commentary on each of the sub-area surveys is provided in later sections of this report, written in each case by one of the survey team members.

In total, 2,053 shorebirds were located in the survey, comprising 13 species as detailed in Table 5. Ten of the species recorded are migratory shorebirds (the total count of these was 1,892 birds). Also, 2,417 other waterbird species were recorded (as 24 species – see Table 6 for details). **The total waterbird population recorded in Port Stephens on 8 February was 4,470 birds comprising 37 different species.**

Several birds of prey also were recorded on the survey: Osprey, Whistling Kite, White-bellied Sea-Eagle and Wedge-tailed Eagle. Some observers noted incidental sightings of other non-waterbirds; the data were not collected systematically and are not further discussed in this section (but are mentioned in the reports about the individual survey areas).

Several of the species recorded on 8 February are listed under the NSW Threatened Species Act. The relevant species are presented in Table 7. Further investigation of how each of these species utilises the various habitats of Port Stephens is recommended, in order to be able to develop and implement appropriate management strategies for them.

Table 5 Shorebirds Recorded at Port Stephens on 8 February 2004

Species	Total	Area A	Area B	Area C	Area D	Area E
Black-tailed Godwit (M)	51	50				1
Bar-tailed Godwit (M)	888	410	53	105	289	31
Whimbrel (M)	218		25	1	33	159
Eastern Curlew (M)	649	156	28	455	8	2
Terek Sandpiper (M)	6				6	
Common Sandpiper (M)	1				1	
Grey-tailed Tattler (M)	44					44
Ruddy Turnstone (M)	8				8	
Red-necked Stint (M)	20				20	
Pied Oystercatcher	112	57	18	27	2	8
Sooty Oystercatcher	18	4	10	2		2
Lesser Sand Plover (M)	5				5	
Masked Lapwing	33		8		1	24
TOTAL	**2,053**	**677**	**142**	**590**	**373**	**271**

(M: a migratory shorebird species)

Table 6 Other Waterbirds Recorded on 8 February 2004

Species	Total	Area A	Area B	Area C	Area D	Area E
Black Swan	1056	~150	360	~500	6	40
Pacific Black Duck	3				2	1
Chestnut Teal	7					7
Little Pied Cormorant	46	7	10	3	5	21
Pied Cormorant	458	382	33	2	15	26
Little Black Cormorant	27	15	6			6
Great Cormorant	31	20		3		8
Australian Pelican	162	98	27		8	29
White-faced Heron	8		1		4	3
Little Egret	1			1		
White-necked Heron	1					1
Great Egret	4	4				
Intermediate Egret	1	1				
Striated Heron	4		3			1
Nankeen Night Heron	2					2
Australian White Ibis	30	7	17	1		5
Royal Spoonbill	4	1		1	2	
Arctic Jaeger	5		3	1	1	
Silver Gull	377	177	93	12	75	20
Gull-billed Tern	1					1
Caspian Tern	7	4		3		
Crested Tern	178	114	5	56	1	2
Common Tern	2	1		1		
Little Tern	2	2				
TOTAL	**2,417**	**983**	**558**	**584**	**119**	**173**

Table 7 Species Recorded on 8 February Listed under the NSWTSC Act

Endangered	Little Tern
Vulnerable	Osprey
	Black-tailed Godwit
	Terek Sandpiper
	Pied Oystercatcher
	Sooty Oystercatcher
	Lesser Sand Plover

3.2. Discussion

3.2.1. Survey Methodology

NSW National Parks and Wildlife Service (NPWS) organised the survey which was done using boats and with almost all the counting done from the boat using binoculars. This was the first time that a water-based survey covering the whole of Port Stephens during the same high tide had been attempted. Five sub-areas were surveyed simultaneously: NPWS selected the routes for these and supplied maps. Five boats were provided, two from NSW Waterways and three from NPWS. HBOC supplied thirteen bird observers, with 2-4 people distributed into each of the boats. Each boat also had a skipper – from either NPWS or NSW Waterways – allowing the bird observers to concentrate on identification and counting.

The Austraaslian Wader Study Group (AWSG) collates data from two annual shorebird surveys – one in February, the other in July. Results from the Port Stephens survey will be included in the AWSG wader count. The Port Stephens survey was held the day after HBOC's regular monthly survey of the Hunter River Estuary.

Weather conditions were warm, sunny and calm initially, with a gentle breeze building towards the end of the survey. Port Stephens is subject to strong north-easterly sea breezes, particularly in the afternoon, so an early high tide was chosen to take advantage of the morning calm. Boats departed from Nelson Bay Marina at 10:00 and returned 2½ to 3½ hours later, depending on the route required and how far away from the Marina it was.

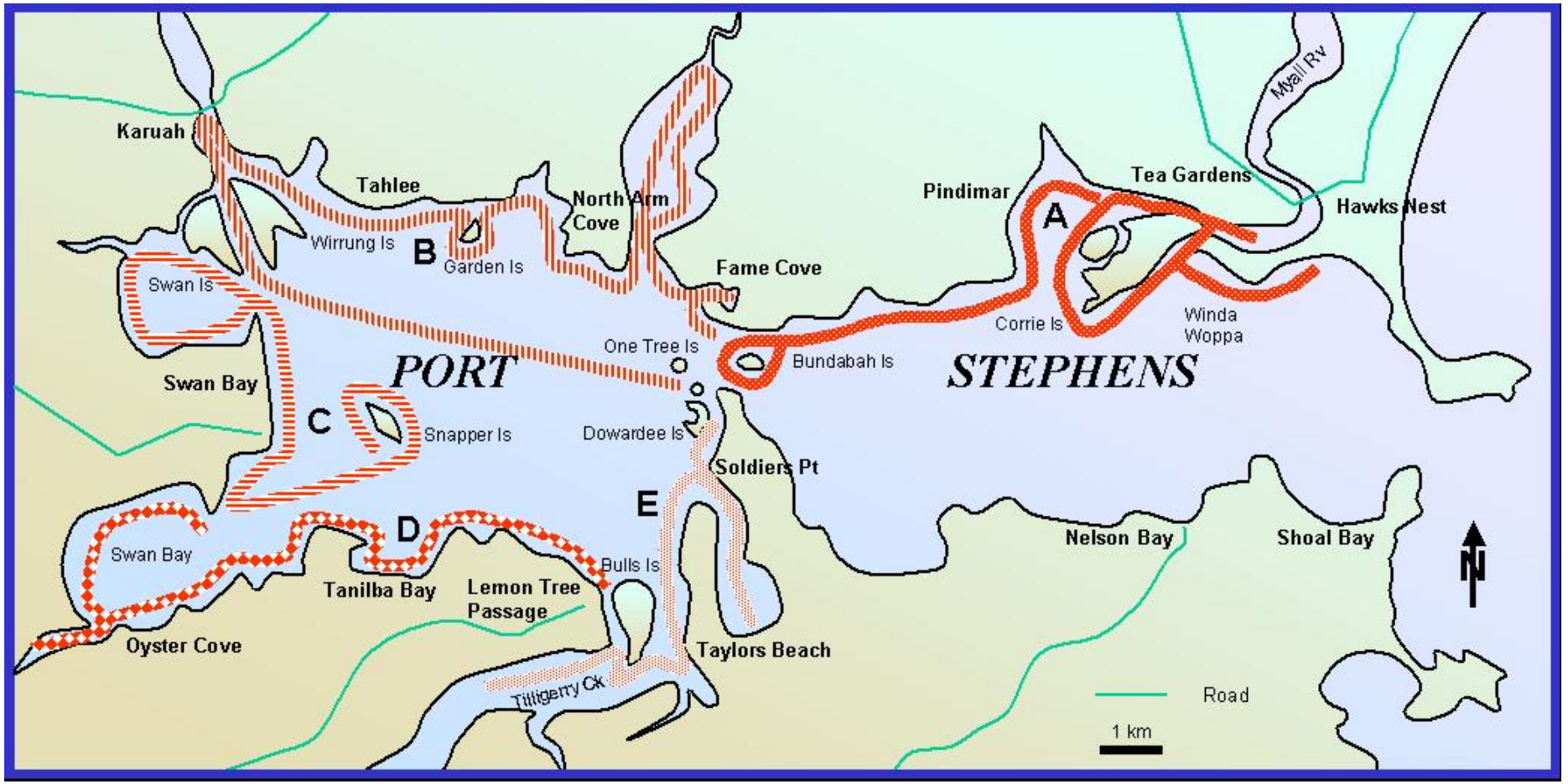
3.2.2. Counts of Individual Species

The large migratory shorebirds (Godwits, Curlew, Whimbrel) in Port Stephens are present in significant numbers. Counts of 888 Bar-tailed Godwit and 649 Eastern Curlew can be compared to the February counts in the Hunter River Estuary ("Estuary") of 1,200 birds and 475 birds, respectively. The Eastern Curlew count in Port Stephens represents 1.7% of the estimated total world population for the species (Delany and Scott, 2002). Later in the Report, historic records of even greater numbers of Eastern Curlew will be described. *Locations supporting >1% of the population of any species are considered to be nationally and internationally significant.*

The count of 218 Whimbrel is substantially greater than the 50-100 birds usually recorded in the Estuary this past summer. However, Whimbrel mainly roost in mangroves and it is probable that the Estuary counts are an under-estimate. The Black-tailed Godwit count is smaller than the typical Estuary count of 200-300+ birds but nevertheless the presence of the species at Port Stephens is a very positive finding – the species is classified as Vulnerable in NSW.

Figure 2 Aerial Photograph of Port Stephens Showing Area Represented in Figures 3-11

Figure 3 Areas of Port Stephens Surveyed February 2004



The counts of the medium and small migratory shorebirds are relatively modest especially in comparison to the numbers that occur in the Hunter River Estuary. Many species were not recorded at all – for example, Curlew Sandpiper, Sharp-tailed Sandpiper, Marsh Sandpiper, Common Greenshank. Similarly, resident shorebirds such as Red-capped Plover, Black-fronted Dotterel, Black-winged Stilt, Red-necked Avocet – all generally common species in the Estuary – were not recorded in the Port Stephens survey.

Both Pied Oystercatcher and Sooty Oystercatcher were present in good numbers, which is a very positive finding. Both species are classified as Vulnerable in NSW. Around 1.0% of the estimated total world population of Pied Oystercatcher was present, making Port Stephens a nationally significant location for the species. Furthermore, it should be noted that Smith (1991) estimated the NSW population of Pied Oystercatcher to be 250 birds, which suggests that around 40% of the NSW population was present in Port Stephens on February 4. Although the estimate for NSW perhaps now requires revision, the importance of Port Stephens for Pied Oystercatcher is undeniable.

The estimated population of the southern Australian sub-species of the Sooty Oystercatcher *(Haematopus fuliginosus fuliginosus)* is estimated at 4,000 birds; hence around 0.5% of the total population of this species also were present and thus Port Stephens is an important location for it.

Table 8 Species with >1% of Total Population Present in Port Stephens

Species	Feb 8 Count	Estimated Total Population	% of Population in Port Stephens
Eastern Curlew	649	38,000	1.7%
Pied Oystercatcher	112	11,000	1.0%

Of the various other non-shorebird species recorded, most were present in numbers that were in line with the normal distribution of the species within the Hunter Region. Five species were present in uncommonly high counts:

Black Swan: The Port Stephens count of >1000 birds is considered a very significant one for the Hunter Region; it is possibly the highest known count for the Region. Most years there are 5-6 records of 100+ birds in the Region. From 1993-2002, there are only 6 records of >500 birds. An estimated 1000 birds were in the Myall Lakes system in 1994 but a precise count was not able to be made.

Pied Cormorant: The count of 458 birds is considered an extremely significant one for the Hunter Region; it is by far the highest known count for the Region. From 1993-2002, there are only 6 records of >50 birds, and the peak count has been of ~100 birds near Forster in 2000.

Australian Pelican: The count of 162 birds is considered a notable one for the Hunter Region. Most years there are a small number of records of >100 birds, and the peak counts are of around 300 birds.

Silver Gull: The count of 377 birds is considered a notable one for the Hunter Region. Most years there are 5-10 records of 100+ birds, but the peak counts are of >2000 birds.

Crested Tern: The count of 178 birds is considered a notable one for the Hunter Region. There are usually 1-2 records each year of 100+ birds, and the peak count from 1993-2002 is of around 200 birds in 1999.

It should be taken into consideration that the above counts relate to what is by far the largest area survey done in an integrated manner. The counts reflect the nature of the undertaking as much as the number of birds.

3.2.3. Distribution of Roosting Sites for Individual Species

Distribution maps for each of the shorebird species recorded in the survey are presented in Figures 4-11. Most of the species that were present in at least moderate numbers overall, were found to be distributed over several roosting sites, highlighting that it is Port Stephens overall that is their habitat and not just some parts of it. The more significant roosting locations are discussed in the following section.

Several species were recorded at only one location (Oyster Cove) and distribution maps for them have not been included. The species solely at Oyster Cove were Terek Sandpiper, Common Sandpiper, Ruddy Turnstone, Red-necked Stint and Lesser Sand Plover.

Figure 4 Distribution of Black-tailed Godwit February 2004

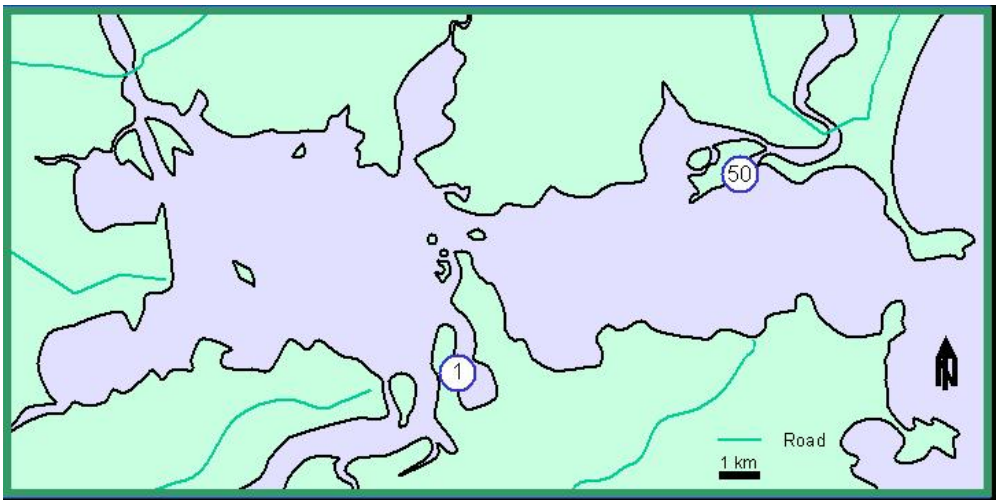


Figure 5 Distribution of Bar-tailed Godwit February 2004

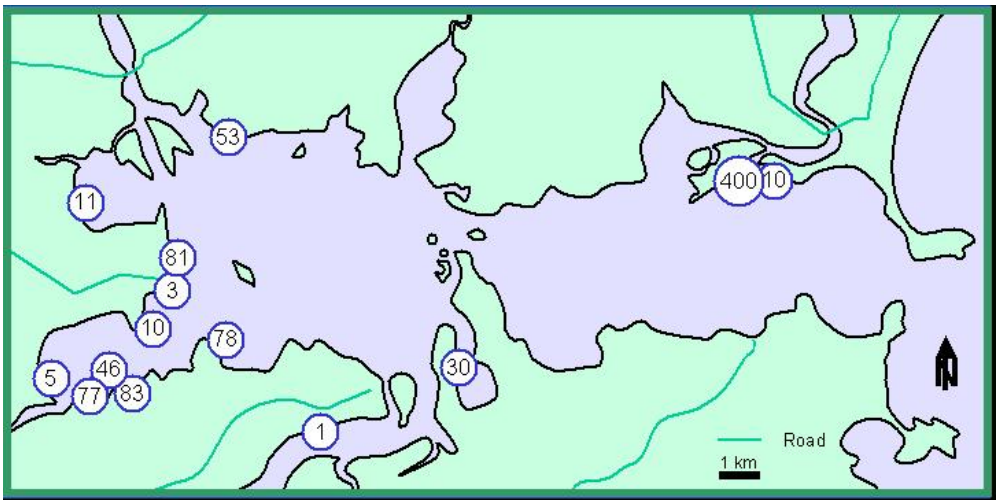


Figure 6 Distribution of Whimbrel February 2004

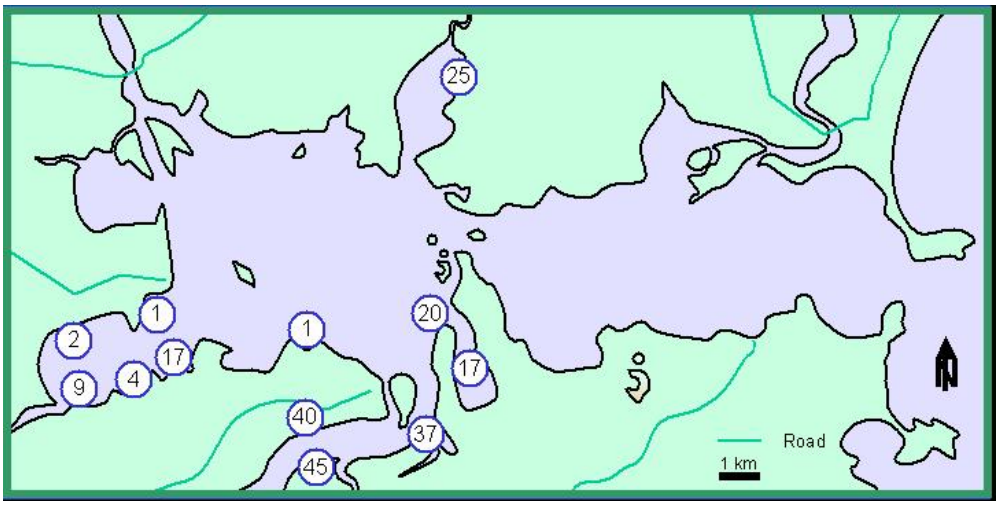


Figure 7 Distribution of Eastern Curlew February 2004

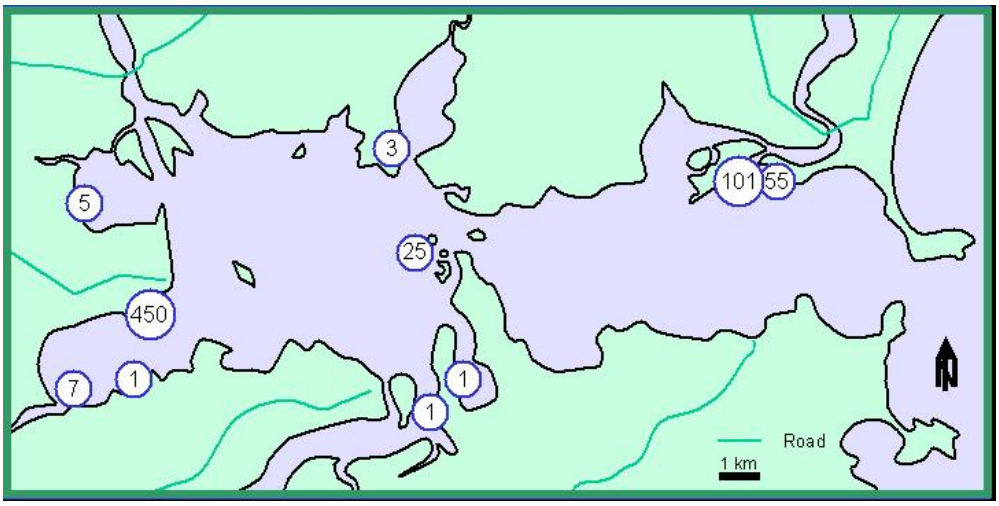


Figure 8 Distribution of Grey-tailed Tattler February 2004

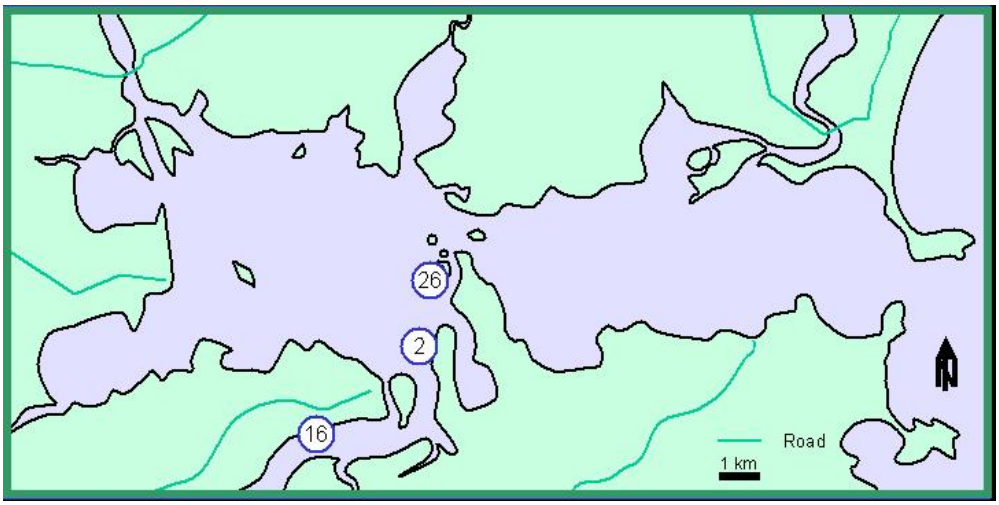


Figure 9 Distribution of Pied Oystercatcher February 2004

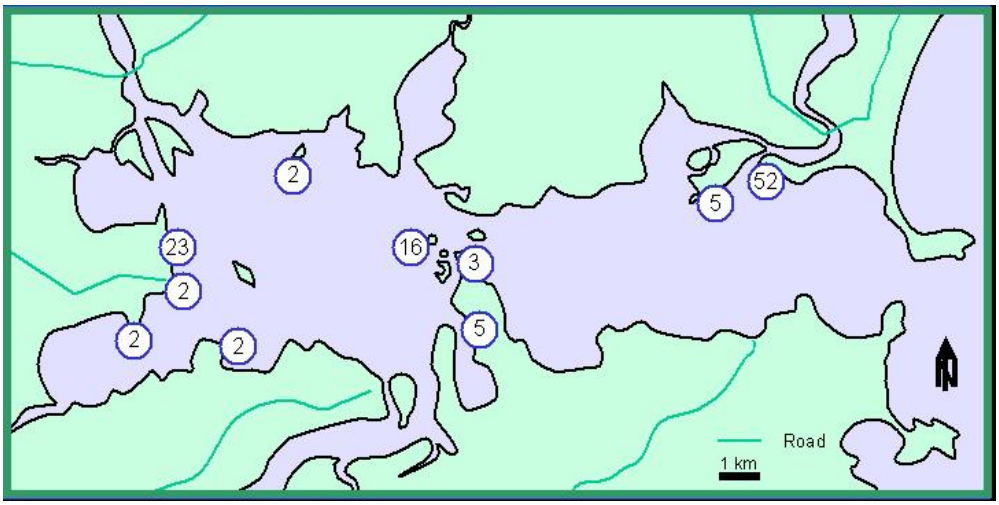


Figure 10 Distribution of Sooty Oystercatcher February 2004

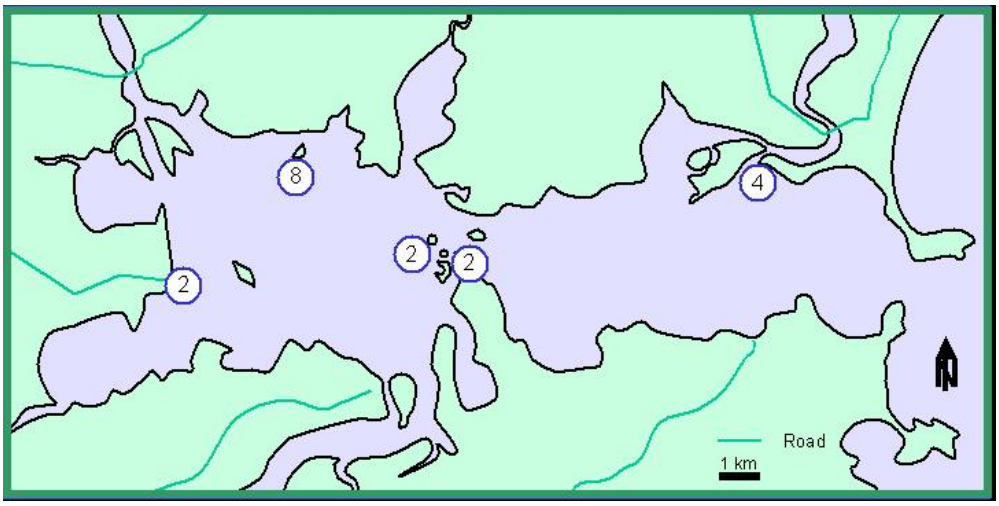
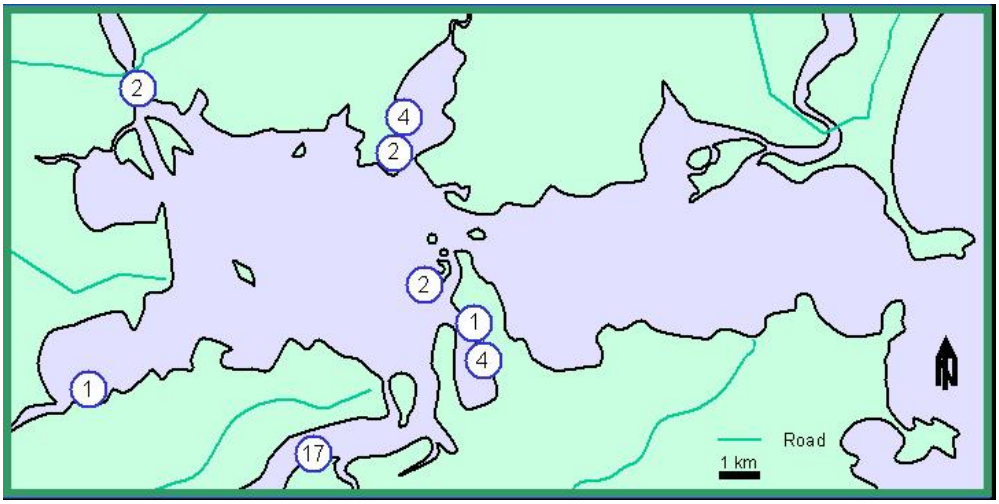


Figure 11 Distribution of Masked Lapwing February 2004



3.2.4. Significant Roosting Locations

In the ensuing sections of the report are presented detailed data for all of the locations surveyed in each of the 5 areas. Locations where 50 or more *waterbirds* were present are considered to be the more significant ones; note however that this is based on a one-off survey and further investigations would likely show that birds also utilise additional locations. The 17 locations having >50 birds present are shown in Table 9. Altogether, these 17 sites accounted for 3,485 birds (i.e. 78% of the total waterbirds recorded on the day).

Most of the birds were roosting on land. However, one factor that was identified from the survey is the importance of emergent posts as additional roost sites. Emergent posts were mainly associated with oyster leases; however, the Pindimar wrecks also provided similar roosting spots. The large shorebirds plus gulls, terns and cormorants were the main users of such roosts.

Table 9 Significant Locations in Port Stephens for Roosting Waterbirds

Site	Total Birds	Birds Present
Jimmys Beach	129	74 Crested Tern, 55 Silver Gull on a small area of beach
Winda Woppa Point	131	2 Sooty Oystercatcher, 54 Eastern Curlew, 10 Australian Pelican, 52 Pied Oystercatcher, 3 Crested Tern, 10 Bar-tailed Godwit
Corrie Island site 1	545	95 Eastern Curlew, ~400 Bar-tailed Godwit, ~50 Black-tailed Godwit
Pindimar Bay wrecks	397	215 Pied Cormorant roosting on 2 exposed wrecks and 32 others on nearby posts, ~150 Black Swan
Oyster leases off Tahlee	64	53 Bar-tailed Godwit, 5 Crested Tern, 1 Little Pied Cormorant, 1 Pied Cormorant, 3 Little Black Cormorant, 1 Australian Pelican
Karuah River at Karuah	99	77 Silver Gull, 17 Australian Pelican, 1 Little Black Cormorant, 1 Striated Heron, 1 Australian White Ibis, 2 Masked Lapwing
Wirrung Island	350	350 Black Swan
North of Swan Bay	995	~500 Black Swan, 2 Pied Cormorant, 3 Little Pied Cormorant, 3 Great Cormorant, 10 Bar-tailed Godwit, 1 Whimbrel, ~450 Eastern Curlew, 2 Pied Oystercatcher, 21 Crested Tern, 3 Caspian Tern
Oyster leases off Swan Bay	140	81 Bar-tailed Godwit, 23 Pied Oystercatcher, 35 Crested Tern, 1 Common Tern
West of Tanilba Bay	131	78 Bar-tailed Godwit, 2 Pied Oystercatcher, 1 White-faced Heron, 50 Silver Gull
Oyster leases off Oyster Cove	55	9 Whimbrel, 46 Bar-tailed Godwit
Oyster Cove	121	77 Bar-tailed Godwit, 1 Common Sandpiper, 6 Terek Sandpiper, 8 Ruddy Turnstone, 5 Lesser Sand Plover, 20+ Red-necked Stint, 1 Silver Gull, 3 Australian Pelican
Cromartys Bay (Area E, site 6)	68	1 Black-tailed Godwit, 30 Bar-tailed Godwit, 17 Whimbrel, 1 Eastern Curlew, 1 Little Pied Cormorant, 11 Pied Cormorant, 1 White-faced Heron, 1 Great Cormorant, 2 Australian White Ibis, 2 Nankeen Night-Heron
Mud Point (Area E site 7)	74	20 Whimbrel, 40 Black Swan, 8 Little Pied Cormorant, 3 Pied Cormorant, 3 Great Cormorant

(table continued next page)

Table 9 (continued)

East of Fenninghams Island (Area E site 10)	50	37 Whimbrel, 6 Little Pied Cormorant, 5 Little Black Cormorant, 2 Australian Pelican
Mud Island Tilligerry Creek (Area E site 12)	67	45 Whimbrel, 17 Masked Lapwing, 1 Pacific Black Duck, 4 Australian Pelican
North of Mud Island (Area E site 13)	69	1 Bar-tailed Godwit, 40 Whimbrel, 16 Grey-tailed Tattler, 7 Chestnut Teal, 3 Pied Cormorant, 1 White-faced Heron, 1 Striated heron

3.3. Details of the Sub-Area Surveys

Shortly after the survey was done, a member of each of the five teams wrote a general description of how the survey of their area was conducted, the species seen, key locations, and made recommendations concerning how any future survey of the area might be undertaken. In this report, the separate write-ups are presented essentially unedited, except to remove some of the more generic commentary that duplicated material covered in the main body of the report. The author of each write-up is indicated in italics.

3.3.1. Area A

Observers: *Alan Stuart*, Robert Macdonald, Nick Livanos and Keith Laverick.

General Description of Survey Route

The NSW Waterways vessel arrived at the Jimmys Beach area around 10:00 a.m. We then proceeded in a westerly direction to Winda Woppa, then around the point and into the Myall River, going eastwards for ~500m. After this we returned to Corrie Island, which we circumnavigated clockwise. We then paused on the survey, going in to Tea Gardens to refuel the boat. In total there was an interruption of ~25 min. before we returned to Pindimar Bay to recommence the survey.

We followed the shoreline along (at some distance from it, see later comments), past Pindimar until reaching Boondabah Island, which we circumnavigated (clockwise). The survey was completed at 12:05 p.m. and we then returned to Nelson Bay.

Summary of Species Recorded

Twenty waterbird species were counted in the survey, totalling 1,660 individual birds. Numbers were as follows:

Ducks & Swans	**Numbers**	**Shorebirds**	**Numbers**
Black Swan	~150	Black-tailed Godwit	~50
Cormorants & Pelicans		Bar-tailed Godwit	~410
Pied Cormorant	382	Eastern Curlew	156
Little Pied Cormorant	7	Pied Oystercatcher	57
Little Black Cormorant	15	Sooty Oystercatcher	4
Great Cormorant	20	**Gulls & Terns**	
Australian Pelican	98	Silver Gull	177
Egrets & Ibis		Crested Tern	114
Intermediate Egret	1	Caspian Tern	4
Great Egret	4	Common Tern	1
Australian White Ibis	7	Little Tern	2
Royal Spoonbill	1		

Observations by Sub-Area

Records were collected for 8 sub-areas of the survey area. Mostly, the birds were counted as the boat moved steadily through each sub-area. Certain sites had substantial numbers of birds present, and the boat was stopped while these birds were counted.

The eight sub-areas were:

A. Jimmys Beach to Winda Woppa

B. Winda Woppa Point

C. Northern side of Winda Woppa/Myall River

D. Eastern side of Corrie Island

E. Southern side of Corrie Island

F. Western side of Corrie Island

G. Pindimar Bay to Pindimar

H. Pindimar to Boondabah Island

The birds recorded in each sub-area are in Table A1

Table A1 – Area A Waterbird Counts by Sub-area

Sub-area	A	B	C	D	E	F	G	H	Total
Black Swan							~150		~150
Pied Cormorant	22			1	34	12	271	42	382
Little Pied Cormorant					1		2	4	7
Little Black Cormorant				12	1		1	1	15
Great Cormorant	1		2	2	4		10	1	20
Australian Pelican		14	2	48	6	10	18		98
Intermediate Egret			1						1
Great Egret			1			2	1		4
Australian White Ibis		1	1			5			7
Royal Spoonbill			1						1
Black-tailed Godwit				~50					~50
Bar-tailed Godwit		10		~400					~410
Eastern Curlew		55		101					156
Pied Oystercatcher		52			5				57
Sooty Oystercatcher		4							4
Silver Gull	70	44	14	7	21			21	177
Crested Tern	74	3	1		25	6		5	114
Caspian Tern					4				4
Common Tern					1				1
Little Tern					2				2
Total Individuals	167	183	23	621	104	35	453	74	1,660

Most Important Locations

Five sites had significant numbers of waterbirds, as presented in Table A2:

Table A2 – Important Sites in Area A

Site	Total Birds	Birds Present
Jimmys Beach	129	74 Crested Tern, 55 Silver Gull on a small area of beach
Winda Woppa Point	131	2 Sooty Oystercatcher, 54 Eastern Curlew, 10 Australian Pelican, 52 Pied Oystercatcher, 3 Crested Tern, 10 Bar-tailed Godwit
Corrie Island site 1	545	95 Eastern Curlew, ~400 Bar-tailed Godwit, ~50 Black-tailed Godwit
Corrie Island site 2	40	13 Pied Cormorant, 16 Crested Tern, 4 Caspian Tern, 5 Pied Oystercatcher, 2 Little Tern
Pindimar Bay wrecks	397	215 Pied Cormorant roosting on 2 exposed wrecks and 32 others on nearby posts, ~150 Black Swan closer to shore

Comments and Recommendations

The survey, together with the 4 others done that day, was very informative and successful. Much valuable data about waterbird numbers in Port Stephens and about key high tide roosting sites were generated. It is strongly recommended that additional surveys be conducted, to extend the database from what is otherwise a one-off snapshot. An annual summertime survey would be very appropriate, with a February timing seemingly very suitable. This means that counts of migratory birds are made before their departure commences in March/April. Consideration should also be given to a wintertime survey, e.g. in July, whereby over-wintering shorebird numbers could be determined. Additional surveys would also clarify whether the sites with large counts of birds, were regularly utilised or whether additional sites are also significant and perhaps therefore requiring management attention.

The survey of Area A was effectively completed in just over 90 minutes, after taking into account the interruption for refuelling. In contrast, the other four surveys required 2½ to 3½ hours each. Some re-allocation of the dimensions of the survey areas could be considered, and/or re-allocation of vessels. The Waterways vessel was not ideal for the latter part of the Area A survey. Because the waters in Pindimar Bay and westwards of it were relatively shallow, the boat was often 80-100m from shore. Thus, while we were able to observe birds such as gulls and cormorants readily, we may have overlooked any small/medium waders along the shoreline. The habitat generally did not seem to be suitable for roosting waders; however, if for example there were Whimbrel roosting in the mangroves these would not have been observed. *(Note added later: In preparing the overall report, it emerged that more than 200 Grey-tailed Tattler historically roosted in the mangroves bordering Pindimar Bay; if any Grey-tailed Tattler were present in 2004 these birds would have been over-looked).*

There were large numbers of godwits at a site on Corrie Island – both Bar-tailed and Black-tailed Godwit were present. The boat had to be >50m from shore, which hindered the making of specific identifications.; also, the birds were agitated by the presence of the boat and were moving around considerably. The reported counts of each are an estimation made by the survey team members in concert.

Some raptors were also observed (White-breasted Sea-eagle, Whistling Kite, Osprey) in the survey area. As these would utilise a large area of Port Stephens habitat, they were not included into the survey results.

3.3.2. Area B

Observers: *Liz Crawford*, Neil Fraser, Chris Herbert.

General Description of Survey Route

Route B commenced at the entrance to Fame Cove, explored North Arm Cove up to Bundabah Creek, then headed west along the shoreline to Garden Island, west past Tahlee and Number One Cove to the Pacific Highway Bridge at Karuah. The route then headed southwards between Wirrung and Swan Islands and terminated on the south-eastern side of Wirrung Island. A brief stop was made at One Tree Island on the return voyage.

The boat departed Nelson Bay at approximately 10.00 am and returned at 12.45 pm. Survey of Route B commenced at 10.17 am and was completed off the south-eastern end of Wirrung Island at 12.17 pm. A brief stop was made at One Tree Island at 12.30 pm.

Survey Results

Our first observation was of 3 Arctic Jaegers flying south just east of Soldiers Point, approximately 2 kilometres east of our official survey start.

Fame Cove

Route B commenced at the entrance to Fame Cove. No birds were seen on the rocky shores immediately east of Fame Cove entrance, despite a close search from approximately 20m off shore.

Within Fame Cove, we motored slowly around the edge of the bay searching for birds on the rocky shoreline. Several yachts were moored in the bay as it is a secure anchorage and favoured by recreational boaters. The only shorebirds observed were a White-faced Heron roosting on rocks and a Striated Heron foraging along the rocky shoreline. All birds observed in Fame Cove are listed in Table B1.

Table B1 – Route B Survey Results – Fame Cove

Bird Species	**Numbers**
Little Pied Cormorant	2
Pied Cormorant	1
White-faced Heron	1
Striated Heron	1
Osprey	1
Whistling Kite	1
Silver Gull	4
Australian Raven	1

Fame Cove survey times: 10.17 – 10.27am GPS: 32 40 0.948, 152 03 0.859

No birds were observed on the rocky shore between Fame Cove and the entrance to North Arm Cove.

North Arm Cove

After entering North Arm Cove, a Striated Heron, 2 Rainbow Lorikeets and more than 5 Noisy Miners were observed.

Three Eastern Curlews were roosting on oyster-farm poles on the eastern side of North Arm Cove. Two Silver Gull and 6 Pied Cormorant were also present as well as 2 Masked Lapwing on the shore. GPS: 32 41 0.026, 152 03 0.428.

A little further north, 4 Masked Lapwing were on a long stretch of sandy shore, near Bundabah.

Twenty-five Whimbrel were roosting on a rocky point, north of Bundabah, on the eastern side of North Arm Cove. GPS: 32 39 0.580, 152 03 0.551.

Numerous oyster leases restricted close access to the shore at the head of North Arm Cove. However, oyster-farm poles provided roost sites that were occupied by cormorants and Silver Gulls. The tide was so high that all horizontal bars associated with the oyster farms were submerged and only the vertical poles were exposed. We surveyed the navigable channel at the head of North Arm Cove up to a creek junction, scanning the mangrove-lined shore for roosting birds from a distance of approximately 50 to 100 m. It is quite possible that birds such as Whimbrel may have been roosting in mangroves and not observed. However, the flock of Whimbrel observed roosting on the rocky point in North Arm Cove indicated that there were alternative roost sites available for these birds. By the time we reached the creek junction at the northern end of North Arm Cove, it was 11.18 am and we had taken almost half the survey time to cover a quarter of the allocated route. We decided that the western side of North Arm Cove was unlikely to harbour many shorebirds as it is quite populated. Furthermore, access is difficult due to oyster leases. Consequently, we decided to make a fast exit out of North Arm Cove and spend time surveying the shoreline to the west.

Table B2 lists all the birds that were observed in North Arm Cove, right up to the creek junction. Note also that a large stick nest, possibly belonging to a White-bellied Sea-Eagle or an Osprey, was observed at the creek junction in Bundabah Creek at the northern end of North Arm Cove. GPS: 32 38 0.586, 152 03 0.652

North Arm Cove to Garden Island

This shoreline is rocky and sparsely urbanised. No shorebirds were observed. Two Little Pied Cormorants and 10 Black Swans were foraging in the inlets of Baberook?? Cove. GPS: 32 40 0.095, 152 01 0.644. Time for survey 11.35 am to 11.40 am.

Garden Island

Eight Sooty Oystercatchers and 2 Pied Oystercatchers were roosting on the rocky south-western point of Garden Island. Eight Pied Cormorant and 2 Little Pied Cormorant were roosting on nearby oyster poles. GPS: 32 45 0.011, 152 00 0.971.

Tahlee

Approximately half way between Garden Island and the eastern end of Wirrung Island, off Tahlee, are extensive oyster farms. Fifty-three Bar-tailed Godwits were roosting on oyster poles at this location, along with 5 Crested Tern, 1 Little Pied Cormorant, 1 Pied Cormorant, 3 Little Black Cormorant and 1 Australian Pelican. Each bird roosted separately on the barely exposed poles. GPS: 32 44 0.095, 151 59.

Table B2 – Route B Survey Results - North Arm Cove

Bird Species	Numbers
Little Pied Cormorant	3
Pied Cormorant	6
Little Black Cormorant	3
Australian Pelican	2
Great Egret	2
Striated Heron	1
Australian White Ibis	15
Osprey	1
Whistling Kite	1
White-bellied Sea-Eagle	1
Whimbrel	25
Eastern Curlew	3
Masked Lapwing	6
Silver Gull	9
Rainbow Lorikeet	2
White-throated Needletail	10
Noisy Miner	5
Yellow-faced Honeyeater	1
Eastern Spinebill	1
Black-faced Cuckoo-shrike	1
White-breasted Woodswallow	4
Mistletoebird	1

Tahlee to Karuah Bridge

West from Tahlee to the Karuah Bridge is a broad channel between the mainland and Wirrung Island. No migratory waders were observed in this section. Table B3 lists the birds seen.

Table B3 – Route B Survey Results – Tahlee to Karuah Bridge

Bird Species	Numbers
Pied Cormorant	3
Australian Pelican	7
Great Egret	1
Striated Heron	1
Silver Gull	3

Karuah

The southern shore of the Karuah River at Karuah is developed with numerous jetties, sheds and moorings. Numerous Silver Gulls and Pelicans were roosting on the jetties. Table B4 lists the birds seen in this area. GPS: 32 39 0.371, 151 58 0.138.

Table B4 – Area B Survey Results – Karuah area, southern shore

Bird Species	Numbers
Little Black Cormorant	1
Australian Pelican	17
Striated Heron	1
Australian White Ibis	1
Masked Lapwing	2
Silver Gull	77

Between Wirrung Island and Swan Island

The channel between Wirrung Island and Swan Island is fringed with mangroves and moderately shallow so we were approximately 100 metres from the shore. Despite scanning the mangroves with binoculars, we did not locate any shorebirds. We observed on White-bellied Sea-Eagle roosting in a tree.

Wirrung Island appeared to have extensive saltmarsh beyond the fringing mangroves and it is quite possible that shorebirds might roost in the saltmarsh.

At the eastern end of Wirrung Island, 350 Black Swans were foraging in the shallows. GPS: 32 40 0.846, 151 58 0.795.

This marked the official end of Area B. The time was 12.16 pm. The actual survey had taken 2 hours and the total boat time was 2 hours 45 minutes.

One Tree Island

On the return trip to Nelson Bay, we paused briefly at One Tree Island as we knew from past experience that it was likely to have roosting shorebirds. We surveyed the south-western rocky shore (sheltered from the growing sea-breeze) and found: 13 Pied Cormorant, 25 Eastern Curlew, 16 Pied Oystercatcher and 2 Sooty Oystercatcher.

Conclusions

Fast boats with dedicated drivers provided excellent platforms for bird observing. Although oyster leases and shallow waters restricted access along some shorelines, we felt that Area B was well-covered, even when 100 m from the shore. Oyster poles and isolated rocky shorelines were favoured by shorebirds whereas gulls and pelicans were more common along urbanised shorelines.

Oyster leases in North Arm Cove and between Tahlee and Wirrung Island are important roost sites. Rocky points on the eastern side of North Arm Cove, on the southern side of Garden Island and on One Tree Island are also important roost sites for shorebirds.

The total numbers of shorebirds recorded on Area B are listed in Table B5.

Table B5 – Area B Survey Results – All Waterbirds from Fame Cove to Wirrung Island, including One Tree Island

Bird Species	Numbers
Black Swan	360
Little Pied Cormorant	10
Pied Cormorant	33
Little Black Cormorant	6
Australian Pelican	27
White-faced Heron	1
Great Egret	3
Striated Heron	3
Australian White Ibis	17
Bar-tailed Godwit	53
Whimbrel	25
Eastern Curlew	28
Pied Oystercatcher	18
Sooty Oystercatcher	10
Masked Lapwing	8
Silver Gull	93
Crested Tern	5

3.3.3. Area C

Observers: *Jenny Powers*, Sue Hamonet

Weather and tide

Fine sunny day with a light breeze, which picked up towards the end of the survey. Tide reported to be very high by Michael Murphy and Sue Hamonet.

General description of survey

The survey was conducted by two HBOC members, Sue Hamonet and Jenny Powers and Michael Murphy (NSW NPWS) who was the skipper of an inflatable boat provided by NSW Waterways. On the way to our site, we recorded one Arctic Jaeger sitting on the water (GPS E040880 N6381150).

We arrived at the south-eastern end of Snapper Island around 10.30am and circled the island in a counter clockwise direction before heading for the northernmost tip of Swan Bay. We then continued as close as possible to the shore in a northerly direction. Approximately 700m along this shore we observed a number of Eastern Curlew in a lagoon ~100m from the shore behind some small mangroves. We stopped the boat and proceeded on foot towards the lagoon to obtain a better view. Unfortunately the curlew flew off in two groups, one to another lagoon slightly to the north and the other group eastwards. We obtained a reasonable count of both groups of birds and checked with the survey D group that they had not counted the eastern group of birds. We returned to the boat and headed in an easterly ~100m to the

oyster leases. We continued in a north easterly direction to and circled a small island, known as Pelican Island by the locals.

We then travelled in a northerly direction along the shoreline, but on the outside of the oyster leases off the village of Swan Bay to the south-eastern end of Little Swan Bay. As we were uncertain of the depth of this bay we continued into Little Swan Bay along the outer edge of the oyster leases heading in a westerly direction. Approximately half way across Little Swan Bay we turned south through the oyster leases and into the mangroves (GPS 324139, 1515724). Here Michael tied up the boat and went ashore to have a look at an inlet/ lagoon behind the mangroves. It may be possible to access this site by travelling further east along the mangroves. As we were running out of time and tide we could not investigate. From this point we continued in a northerly direction to the next inlet off Little Swan Bay, where we finished our survey at approximately 1.30pm.

Summary of species recorded

Ducks & Swans	**Numbers**	**Shorebirds**	**Numbers**
Black Swan	~500	Bar-tailed Godwit	105
Cormorants & Pelicans		Whimbrel	1
Pied Cormorant	2	Eastern Curlew	~455
Little Pied Cormorant	3	Pied Oystercatcher	26
Great Cormorant	3	**Gulls & Terns**	
Egret & Ibis		Silver Gull	12
Little Egret	1	Crested Tern	56
Australian White Ibis	1	Caspian Tern	3
Royal Spoonbill	1	Common Tern	1

Observations by sub-area

The five major sites for shorebirds were:

1. North of the northern tip of Swan Bay
2. Small island to the south of village of Swan Bay
3. Oyster leases off village of Swan Bay and to the north
4. Lagoon behind southern side of Little Swan Bay
5. Pier off settlement at north-western end of Little Swan Bay

The waterbirds recorded in each of these sub-areas are presented in Table C1. Note that Silver Gull were scattered through sites (n=12). Also, one White-bellied Sea Eagle and one Whistling Kite were observed near Area 1, where they have been sited previously by both Sue Hamonet and Michael Murphy.

Comments and recommendations

Sue Hamonet has done monthly surveys of Swan Bay from the land and reported that waders often congregate at Pelican Island with lower high tides. With the exception of the Eastern Curlew, the shorebirds were mainly found sitting on the poles associated with the oyster leases or on a pier at the end of little Swan Bay. It is likely that these birds would use

alternative sites when the high tide is lower. However with lower high tides it may not be possible to access Area 4.

Table C1 – Area C Waterbird Counts by Sub-area

	1	2	3	4	5
Black Swan	~500				
Pied Cormorant	2				
Little Pied Cormorant	3				
Great Cormorant	3				
Little Egret				1	
Australian White Ibis				1	
Royal Spoonbill				1	
Bar-tailed Godwit	10	3	81		11
Whimbrel	1				
Eastern Curlew	~450			5	
Pied Oystercatcher	2	2	23		
Crested Tern	21		35		
Caspian Tern	3				
Common Tern			1		

3.3.4. Area D

Observers: *Ann Lindsey*, Mike Newman

Location: Area D – northern end of Bull Island, Lemon Tree Passage, Tanilba Bay, Oyster Cove, Swan Bay.

Time: high tide; started 10:20am finished 1.30pm

Weather: calm, sunny, hot until about 12:45 when a strong wind blew up. Waves and wind and location of inshore oyster leases in some places made it difficult to get close to shore and to identify birds.

We spent far too much time around Lemon Tree Passage and Tanilba Bay where shoreline is largely occupied by houses, parks. Apart from gulls and cormorants etc. we saw only 1 Whimbrel along these shores.

The first hotspot was the rocky point just west of Tanilba Bay, marked Site A on the map. A house with a green roof is situated just behind the rocks and we suspect that if people were present, the birds would not be present. However, we do not know that for a fact.

78 Bar-tailed Godwits, 2 Pied Oystercatchers, 1 White-faced Heron and 50 Silver Gulls were roosting on the rocks. Some were preening.

The shoreline west of Tanilba Bay is mangrove lined, Site B on the map. We flushed 17 Whimbrels, which had been roosting. They flew about 100 metres and roosted again in mangroves. 2 Royal Spoonbills and 1 White-faced Heron present.

Further along were 4 more Whimbrel, an Eastern Curlew, 2 Pacific Black Ducks.

Near Oyster Cove, Site C, all emergent posts away from the shore were occupied by birds. 9 Whimbrels and 46 Bar-tailed Godwits were counted roosting on these posts.

At Oyster Cove outside the marine boat yard on a rock jetty, Site D, were roosting:

77 Bar-tailed Godwits, 1 Common Sandpiper, 6 Terek Sandpipers, 8 Ruddy Turnstones, 5 Lesser Sand Plovers, 20 Red-necked Stints (probably undercounted), 3 Pelicans and 1 Silver Gull.

The roost site is very close to the boat yard.

From this point on weather conditions worsened and we were running out of time. In Swan Bay 5 Godwits and 2 Whimbrel were roosting on emergent posts. 7 Eastern Curlew flushed from the mangroves. Whistling Kites and a White-bellied Sea-eagle were in the air.

We suggest that in future, surveys of this particular Area are started at the Swan Bay end when the conditions are calmer. We suspect that the sandy point at the north-eastern end of Swan Bay, site E, would be ideal for roosting waders. By the time we got there conditions were poor and no birds were present. The disadvantage of starting from the Swan Bay end is that the waders roosting at sites closer to habitation may have already been disturbed and flown.

Emergent posts are significant for roosting waders. We nearly missed them because we were looking inshore and Dan our boat driver pointed them out to us.

3.3.5. Area E

Observers: *Terry Lindsey*, Liz Huxtable

The Section allocated to our team was Sector E, essentially the southeastern section of the bay, in the vicinity of Tilligerry Creek (refer accompanying map for details).

Purpose: to locate, chart and census high-tide roosts of migratory wading birds (Scolopacidae and Charadriidae).

Equipment: binoculars; light rubber boat, with a small outboard motor and crew of three.

Weather: hot, clear, with wind light to negligible. Tide high, water calm, visibility unlimited.

Area: The Area actually covered was substantially shorter than that planned (as marked on map), the difference dictated by shortage of time. In the event of further such surveys, a more thorough search, especially of the narrower, more secluded waterways, would be desirable; nevertheless, we felt it likely all significant roost sites had been located upon completion of the survey.

Habitat: mostly fringe mangroves bordering tidal creeks and narrow waterways, interspersed with narrow sand beaches backed with casuarinas and similar low scrubby vegetation. The east bank of Tilligerry Creek (near its mouth) is mainly narrow rock and boulder strand, yielding almost immediately to eucalypt, banksia and angophora woodland, and largely unsuitable for waders. Almost all of the remainder was mangroves on flat, low-lying land, subject to inundation at extreme high tides or flooding, mostly with variable fringes of mangroves bordering interior samphire flats, shallow salt flats and the like. In many places the mangroves were large and mature, with branches of substantial girth, but elsewhere were stands of small, immature mangroves, largely submerged at low tide (see accompanying chart). Roosting waders were encountered mainly in mature mangroves, not in juvenile trees.

Procedure: participants' functions overlapped to some extent, but mostly the NPWS ranger handled the boat, LH scribed and TL identified. The survey was conducted at slow to moderate pace, as close as practicable to the shoreline, scanning for birds. When a target bird was located, the spot was marked on a map, a sequential number was allocated to the spot, the species of bird or birds present were determined, the number of individuals of each species was counted, and the results recorded against the location number allocated, resulting in a running tally of roosts encountered, together with a census of species and individuals at each. Although the discovery and census of high-tide roosts of migratory waders was the prime objective of the survey, opportunity was also taken to census certain other waterbirds, such as pelicans, terns and cormorants, encountered, although no attempt was made to seek them out.

This protocol was varied twice. Once we turned the engine off and drifted for perhaps 10 min at a roost (a useful variation because Whimbrel – the species most likely to roost in mangroves – are often reluctant to quit their roost simultaneously even when disturbed; they typically roost in parties of around 40-50 or so, scattered and hidden in dense foliage, but tend to flush in groups of perhaps only ten or so; complete exodus may thus span several minutes, which means hasty counts of whimbrel roosts are markedly prone to underestimation). At another point we beached the boat and went ashore briefly to investigate an interior wet samphire flat (the preferred roosting site of Eastern Curlews), but with nul result.

Behaviour: Whimbrels showed a marked preference for large mangroves with branches of substantial girth and dense foliage, and roosted scattered through one or more such trees, generally 3-5 metres above the water. Tattlers showed a similar roost preference, except lower, within a metre or so of the water surface. Bar-tailed Godwits also were encountered roosting in mangroves, considered unusual because this species generally favours exposed, unvegetated sand, mud or shingle flats for roosting.

Results: refer Table E1.

3.4. Acknowledgements

Chris Herbert produced all the maps for this section of the report. Michael Murphy organised the survey including the 5 boats and skippers, with assistance form his colleagues in NSW National Parks & Wildlife Service and NSW Waterways. HBOC members who participated in the survey were Alan Stuart, Robert MacDonald, Keith Laverick, Nick Livanos, Liz Crawford, Chris Herbert, Neil Fraser, Ann Lindsey, Mike Newman, Sue Hamonet, Jenny Powers, Liz Huxtable and Terry Lindsey.

Table E1 – Area B Survey Results

species	totals	locality numbers (refer accompanying text) — 1	2	3	4	5	6	7	8	9	10	11	12	13	14
Black-tailed Godwit	**1**						1								
Bar-tailed Godwit	**31**						30							1	
Whimbrel	159						17	20			37		45	40	
Eastern Curlew	2						1			1					
Grey-tailed Tattler	**44**		26						2					16	
Pied Oystercatcher	8	3			5										
Sooty Oystercatcher	2	2													
Masked Lapwing	**24**		2		1	4							17		
Black Swan	40							40							
Pacific Black Duck	1												1		
Chestnut Teal	7													7	
Little Pied Cormorant	**21**						1	8			6	3			3
Little Black Cormorant	**6**			1							5				
Large Pied Cormorant	**26**		3	5			11	3						3	1
Great Cormorant	**8**		2		1		1	3	1						
White-faced Heron	**3**				1		1							1	
Mangrove Heron	**1**													1	
White Ibis	5		1			2	2								
White-necked Heron	**1**						1								
Australian Pelican	**29**	20									2		4		3
Nankeen Night-heron	**2**						2								
Crested Tern	2		2												
Gull-billed Tern	1			1											
	424	**25**	**36**	**7**	**8**	**6**	**68**	**74**	**3**	**1**	**50**	**3**	**67**	**69**	**7**

4. Port Stephens Shorebird Records from Hunter Region Bird Reports

HBOC commenced publishing annual Bird Reports for the Hunter Region in 1993. These Reports collate all the data that was able to be sourced, about observations of bird species made during the year. Sources include HBOC outings and surveys, also individual records by HBOC members and records from other bird interest groups (e.g. that have been reported in their newsletters).

In general, the observations are opportunistic as is the collecting of the record. Also, for the many species considered to be common in the Hunter Region, only the observations of birds present in unusual numbers or location are published in the Bird Report for that year. Thus, the absence of a record for a particular species in any particular year does not mean that the species was absent, merely that its presence was un-detected or un-reported, or was considered unexceptional. Similarly, a reported count of the number of birds present does not mean that this was the total number of birds in the area, as the observer may not have located all the birds.

Despite these limitations, the Hunter Region Bird Reports do provide another window into the occurrence of bird species locally. In the section below, the shorebird records appertaining to Port Stephens have been extracted from the 1993-2002 Hunter Region Bird Reports (the 2003 Bird Report is not yet available). Records from the monthly Swan Bay/Worimi Nature Reserve high tide surveys are presented in the Bird Reports. They have been excluded from the data below since there is a detailed analysis of them in Section 2 of this report.

Black-tailed Godwit: This species is considered to be a summer migrant in the Hunter Region. Small numbers (1-5 birds) have been recorded at Swan Bay/Worimi N.R. on 9 March 1995, 15 August 1997 and 21 October 2001.

Bar-tailed Godwit: This species is considered to be a common summer migrant that is moderately often recorded at coastal/estuarine mudflats over January-March and September-December, in counts of up to 20 birds. It is also known that many young birds remain over winter. Exceptional records for Port Stephens are:

1993: 20+ birds at Lemon Tree Passage 21 November

1994: 20+ birds at Oyster Cove 29/30 January and 25/26 May, and at Tilligerry Creek 31 January

1995: Winter records of small numbers of birds at Tea Gardens 2 May and Lemon Tree Passage 25 May

1996: 19 birds at Swan Bay 8 June and 21 birds at Lemon Tree Passage 7 August

1997: 50 birds at Lemon Tree Passage 19 July

1998: Summer records of 50+ birds at Oyster Cove 9 January, Lemon Tree Passage 14 March, 31 October and 8 December, and Taylors Beach 10 November. Winter records of 50-75 birds at Lemon Tree Passage during May/June, 12 birds at Swan Bay 21 June, 3 birds at Oyster Cove 17 April and 1 bird there 27 June.

1999: Summer records of 50+ birds at Lemon Tree Passage 18 September and 20+ birds at Oyster Cove 13 March and 20 November. Winter records of ~10 birds at Tanilba Bay 26 April and 50+ birds at Lemon Tree Passage 7 August.

2000: Summer records of ~100 birds at Lemon Tree Passage 26 March. Winter records of 120 birds at Swan Bay 22 July and of <20 birds there for the following two months and also near Tea Gardens 16 April.

2001: Summer records of 80 birds at Corrie Island 28 October. Winter records of 30 birds at Corrie Island 24 June and 78 birds there 12 August.

2002: Winter record of 50+ birds in the Swan Bay/Worimi area 21 July.

Whimbrel: This species is considered to be a usual summer migrant that is occasionally recorded at coastal/estuarine mudflats over January-March and September-December as counts of 1-5 birds. Exceptional records for Port Stephens are:

1994: 6+ birds at Oyster Cove 29/30 January

1995: Winter record of <5 birds at Tahlee 14 August

1997: Winter records of a single bird at Lemon Tree Passage 18 May and 2 birds there 2 August.

1998: Summer record of 6+ birds at Taylors Beach 10 November, and winter records of 2 birds at Lemon Tree Passage 9 May and 21 June.

1999: Summer record of 19 birds at Taylors Beach 24 October. Winter records of a single bird at Lemon Tree Passage 5 July and 3 birds there 7 August.

2000: 6 birds at Swan Bay 22 July.

2001: 11 birds at Corrie Island 28 October

Eastern Curlew: This species is considered to be a common summer migrant that is moderately often recorded at coastal/estuarine mudflats over January-March and September-December, in counts of up to 20 birds, and as counts of 1-5 birds in other months. Exceptional records for Port Stephens are:

1996: 30+ birds at Swan Bay 30 October

1997: 50+ birds at Swan Bay 15 August

1998: 30+ birds at Oyster Cove 24 October and Taylors Beach 10 November

2000: 80 birds at Swan Bay 22 July and 9 birds there 12 August. 20+ birds at Bushy Island 13 January and Myall River mouth 12 February.

2001: 8 birds at Corrie Island 24 June and 34 birds there 28 October.

Marsh Sandpiper: There are no Bird Report records for the Port Stephens area. This species is considered to be a usual summer migrant in the Hunter Region.

Common Greenshank: In 1994, 20-25 birds were recorded at Tea Gardens 17 November and Swan Bay 24 November. The only other record, apart from those from the monthly surveys at Swan Bay/Worimi, is of a single bird at Worimi N.R. 16 March 2002. This species is considered to be a usual summer migrant in the Hunter Region.

Wood Sandpiper: There are no Bird Report records for the Port Stephens area. This species is considered to be a rare summer migrant in the Hunter Region.

Terek Sandpiper: 6+ birds were in the Tilligerry Peninsula area 8 May 1997. This species is considered to be a summer migrant in the Hunter Region.

Common Sandpiper: There are no Bird Report records for the Port Stephens area. This species is considered to be an uncommon summer migrant in the Hunter Region.

Grey-tailed Tattler: This species is considered to be a summer migrant that is occasionally recorded at coastal/estuarine mudflats over January-April and September-December, in counts of up to 10 birds. Exceptional records for Port Stephens are:

1993: <20 birds in the Hawks Nest/ Tea Gardens area 19 September

1995: <20 birds at Swan Bay 9 March

1996: 12 birds at Lemon Tree Passage 7 August and 20+ birds at Tahlee/Carrington 21 April

1997: 11 birds at Lemon Tree Passage 19 July and 13 birds there 2 August

1998: 50+ birds at Lemon Tree Passage 14 & 20 March. Winter records of 16 birds at Lemon Tree Passage 21 June and 18 birds there mid-August.

1999: ~80 birds at Tahlee/Carrington 24 January. Winter records of 6 birds at Lemon Tree Passage 22 May and 2 birds there 7 August.

2000: 26 birds at Lemon Tree Passage 10 April. Winter record of 9 birds at Swan Bay 22 July.

2001: 34 birds at Worimi N.R. 21 October

2002: Winter record of 4 birds in the Swan Bay/Worimi N.R. area 21 July

Ruddy Turnstone: There are no Bird Report records for the Port Stephens area. This species is considered to be an uncommon summer migrant in the Hunter Region.

Great Knot: There are no Bird Report records for the Port Stephens area. This species is considered to be an uncommon summer migrant in the Hunter Region.

Red Knot: There are no Bird Report records for the Port Stephens area. This species is considered to be a summer migrant in the Hunter Region.

Sanderling: There are no Bird Report records for the Port Stephens area. This species is considered to be rare in the Hunter Region.

Red-necked Stint: In addition to the records from the monthly surveys at Swan Bay/Worimi N.R., 7 birds were at Corrie Island 28 October 2001. This species is considered to be a summer migrant in the Hunter Region.

Pectoral Sandpiper: There are no Bird Report records for the Port Stephens area, other than from the monthly surveys at Swan Bay/Worimi N.R. This species is considered to be rare in the Hunter Region.

Sharp-tailed Sandpiper: There are no Bird Report records for the Port Stephens area. This species is considered to be a usual summer migrant in the Hunter Region that is moderately often recorded at shallow or drying wetlands over January-April and September-December as counts of up to 20 birds.

Curlew Sandpiper: 10+ birds were at Swan Bay 30 October 1996. This species is considered to be a common summer migrant in the Hunter Region.

Bush Stone-curlew: This species is considered to be an uncommon resident in the Hunter Region. Port Stephens records from the Hunter Region Bird Reports are:

1993: Birds were often heard at Lemon Tree Passage during January to March

1996: A bird was heard calling in the early morning at Tanilba Bay 5 October and a pair with two fledglings were present at Lemon Tree Passage 18 & 21 October.

1998: A pair of birds were heard at Karuah in November

1999: Two pairs of birds were heard at Karuah 12 July

2000: A single bird was at Swan Bay 14 October

2001: Two pairs were recorded at Tanilba Bay during October and birds were nesting there

2002: A pair was nesting near Tanilba Bay in late November

Beach Stone-curlew: This species is considered to be an uncommon resident in the Hunter Region. There are no Bird Report records for the Port Stephens area.

Pied Oystercatcher: This species is considered to be a resident in the Hunter Region, that is moderately often recorded in counts 1-5 birds. Exceptional Port Stephens records are:

1994: 6 birds at Tea Gardens 17 November

1996: 11 birds at Oyster Cove 12 & 29 October

1998: 6 birds at Port Stephens 11 April and 10 birds at Oyster Cove 9 January

2000: 6+ birds at Swan Bay 14 October

2001: 18 birds at Corrie Island 12 August and 6+ birds at Worimi N.R. 14 February

Sooty Oystercatcher: This species is considered to be an uncommon resident in the Hunter Region. Port Stephens records are:

1996: <5 birds at Oyster Cove 4 October

1997: <5 birds at Tahlee/Carrington 24 August

1998: <5 birds at Port Stephens 11 & 26 February and at Tahlee 8 August

1999: 1-2 birds at Lemon Tree Passage 22 May

2000: Birds were nesting at Boondelbah Island in March

2001: 3 birds at Corrie Island 12 August

2002: <5 birds at Swan Bay 31 August

Black-winged Stilt: This species is considered to be a usual resident in the Hunter Region, that is moderately often recorded at medium to large waters as counts of up to 10 birds. There are no exceptional Port Stephens records in the Bird Reports.

Banded Stilt: This species is considered to be accidental in the Hunter Region. There are only two records from the monthly surveys at Swan Bay/Worimi N.R. but the bird recorded in the survey on 16 September 2000 was present until at least 29 October.

Red-necked Avocet: This species is considered to be a bird of passage in the Hunter Region. There are no Bird Report records for the Port Stephens area.

Pacific Golden Plover: This species is considered to be a summer migrant in the Hunter Region. Port Stephens records, excluding the surveys at Swan Bay/Worimi, are:

1996: 3 birds at Swan Bay 30 October

1998: A single bird at Oyster Cove 17 April

Grey Plover: This species is considered to be accidental in the Hunter Region. There are no Bird Report records for the Port Stephens area.

Red-capped Plover: This species is considered to be a usual resident in the Hunter Region, being moderately often recorded as counts of up to 10 birds. Port Stephens records are:

1996: ~50 birds at Swan Bay 8 June

2001: 10 birds at Hawks Nest 20 January

Double-banded Plover: This species is considered to be a winter migrant in the Hunter Region. Port Stephens records from the Bird Reports are:

1996: 29 birds at Swan Bay 8 June

1997: 6+ birds at Swan Bay 15 August

2000: 26 birds at Swan Bay 22 July and 5 birds there 12 August

2001: 4 birds at Corrie Island 12 August

2002: 24 birds at Swan Bay 21 July

Lesser Sand Plover: This species is considered to be an uncommon summer migrant in the Hunter Region. Other than from the Swan Bay/Worimi surveys, the only other Port Stephens record in the Bird Reports is of a single bird at Hawks Nest 20 January 2001.

Black-fronted Dotterel: This species is considered to be a resident in the Hunter Region, being moderately often recorded at medium waters as counts of 1-5 birds. There have been no exceptional Port Stephens records.

Red-kneed Dotterel: This species is considered to be a bird of passage in the Hunter Region. There are no Bird Report records for the Port Stephens area.

Banded Lapwing: This species is considered to be rare in the Hunter Region. There are no Bird Report records for the Port Stephens area.

Masked Lapwing: This species is considered to be a common resident in the Hunter Region, being regularly recorded near medium to large waters as counts of up to 20 birds. The only exceptional Port Stephens record is of 20+ birds at Hawks Nest/Tea Gardens 16 April 2000.

5. Port Stephens Shorebird Records from NSW Bird Reports

The NSW Field Ornithologists Club (now known as Birding NSW) commenced publishing annual Bird Reports for NSW in 1971. These Reports collate all the data that was able to be sourced, about observations of bird species made during the year. Sources include Birding NSW outings, also individual records by the Club's members and records from other bird interest groups (e.g. that have been reported in their newsletters).

As with the Hunter Region Bird Reports, the observations are opportunistic as is the collecting of the record. Also, for the many species considered to be common in NSW, only the observations of birds present in unusual numbers or location are published in the Bird Report for that year. Thus, the absence of a record for a particular species in any particular year does not mean that the species was absent, merely that its presence was un-detected or un-reported, or was considered unexceptional. Similarly, a reported count of the number of birds present does not mean that this was the total number of birds in the area, as the observer may not have located all the birds.

In the section below, the shorebird records appertaining to Port Stephens have been extracted from the 1971-2000 NSW Bird Reports (more recent Reports are not yet available). Records that also appear in the Hunter Region Bird Reports have been excluded from the data below since there is a detailed analysis of them in Section 4 of this report.

Whimbrel:

1982: 260 birds at Swan Bay 4 April

1984: 30 birds at Taylors Beach 11 February

Eastern Curlew:

1985: 418 birds at Port Stephens in February

Bush Stone-curlew:

1980: 2 birds at Taylors Beach 28/29 June, 2 birds at Bulls Island 1 November

1989: Dead bird found at Karuah (date not noted)

Red-necked Avocet:

1980: A single bird at Taylors Beach 1 November

Pacific Golden Plover:

1988: 5 birds at Swan Bay 15 July

Grey Plover:

1980: A single bird at Taylors Beach 1 November

Double-banded Plover:

1972: A single bird at Hawks Nest 4 December

1988: Present at Swan Bay 15 July – 20 August, with peak count of 40 birds 15 July

Lesser Sand Plover:

1971: 100 birds at Swan Bay 25 May (noted as a "late date" suggesting that birds were well known to be present at the location)

6. Australasian Wader Study Group Survey Results

Over 1982-1984, some members of HBOC participated in the twice yearly national wader surveys conducted by the Australasian Wader Study Group (AWSG). These surveys were done in summer (February) and winter (June or July) for all three years. Some locations around Port Stephens were visited as part of these surveys:

- Swan Bay (all 3 years)
- Taylors Beach (all 3 years)
- Karuah/North Arm Cove (summer of 1982 only)
- Tahlee/Carrington (summer of 1982 only)

In Tables 10-12 below, the results for the summer and winter surveys of these areas are presented on a year by year basis. The summer surveys were always done in February. The 1982 winter survey was done in July, the other 2 years were done in June.

Table 10 AWSG Survey Results for Port Stephens 1982

	Summer (February)					Winter (July)		
	SB	TB	K/NAC	T/C	**Total**	SB	TB	**Total**
Bar-tailed Godwit	550+	48		3	**600+**	60	46	**106**
Whimbrel	6	21			**27**	25		**25**
Eastern Curlew	700+	110	3	4	**800+**	41	1	**42**
Marsh Sandpiper								
Common Greenshank						1		**1**
Grey-tailed Tattler	4	12		5	**21**	18	19	**37**
Ruddy Turnstone						3		**3**
Red Knot								
Red-necked Stint	150+				**150+**	33		**33**
Pectoral Sandpiper								
Sharp-tailed Sandpiper	25	14	3		**42**			
Curlew Sandpiper				30	**30**	1		**1**
Pied Oystercatcher							4	**4**
Sooty Oystercatcher								
Black-winged Stilt	4				**4**	13		**13**
Banded Stilt								
Pacific Golden Plover								
Red-capped Plover	70+				**70+**	53	2	**55**
Double-banded Plover						28	1	**29**
Lesser Sand Plover								
Black-fronted Dotterel								
Red-kneed Dotterel						15		**15**
Masked Lapwing	8	3	2	3	**16**	31	2	**33**
TOTAL	**1500+**	**208**	**8**	**45**	**1750+**	**322**	**75**	**397**

The 1982 summer survey for AWSG was not a systematic survey of all of Port Stephens but it provides the closest analogue available to the data that would be generated from such a survey. Therefore, some comparisons with the February 2004 survey are worthwhile to make. Firstly, the counts of Bar-tailed Godwit and Eastern Curlew are similar across the two surveys despite a gap of 22 years. Overall, around 15% more shorebirds were recorded in 2004, which perhaps reflects that the coverage of areas was greater. For example, many more Whimbrel were recorded in 2004; these mainly were in an area less accessible to land-based surveys. Also, many more Grey-tailed Tattler were in this area and so the 2004 tally for these also was greater than in 1982. No Pied or Sooty Oystercatcher were recorded in 1982 but significant numbers of both species were present in 2004. Conversely, significant numbers of Red-necked Stint were in Port Stephens in 1982 and none recorded in 2004; similarly both Curlew Sandpiper and Sharp-tailed Sandpiper were absent in 2004.

The count of 800+ Eastern Curlew in 1982 represents 2.1% of the estimated total world population of the species and hence is a very significant one. Smith (1991) gives a count of 960 birds in 1982 which would represent 2.5% of the population; however the origin of his raw data is unclear.

Together, the 1982 and 2004 surveys affirm that Port Stephens has been an important location for around 2000 shorebirds over a span of over 20 years. They also serve to highlight the potential value that would come from a program of regular systematic surveys, as distinct from some occasional snapshots that are presently available.

Table 11 AWSG Survey Results for Port Stephens 1983

	Summer (February)			Winter (June)		
	Swan Bay	Taylors Beach	**Total**	Swan Bay	Taylors Beach	**Total**
Bar-tailed Godwit	100	86	**186**	73		**73**
Whimbrel	12	16	**28**		5	**5**
Eastern Curlew	219	88	**307**	67	38	**105**
Marsh Sandpiper						
Common Greenshank						
Grey-tailed Tattler	16		**16**			
Ruddy Turnstone						
Red Knot						
Red-necked Stint	47	52	**99**	21	2	**23**
Pectoral Sandpiper						
Sharp-tailed Sandpiper	153	31	**184**			
Curlew Sandpiper	1		**1**	1		**1**
Pied Oystercatcher						
Sooty Oystercatcher						
Black-winged Stilt						
Banded Stilt						
Pacific Golden Plover	37	5	**42**	9		**9**
Red-capped Plover	19	41	**60**	19	23	**42**
Double-banded Plover				33	36	**69**
Lesser Sand Plover		2	**2**			
Black-fronted Dotterel						
Red-kneed Dotterel						
Masked Lapwing	10	11	**21**	10	2	**12**
TOTAL	**614**	**332**	**946**	**233**	**106**	**339**

Table 12 AWSG Survey Results for Port Stephens 1984

	Summer (February)			Winter (June)		
	Swan Bay	Taylors Beach	**Total**	Swan Bay	Taylors Beach	**Total**
Bar-tailed Godwit	75	38	**113**	114		**114**
Whimbrel	7	30	**37**	7	2	**9**
Eastern Curlew	103	79	**182**	148	4	**152**
Marsh Sandpiper	1		**1**			
Common Greenshank	9		**9**			
Grey-tailed Tattler	51	9	**60**	27		**27**
Ruddy Turnstone	2		**2**	20		**20**
Red Knot						
Red-necked Stint	105		**105**	14		**14**
Pectoral Sandpiper						
Sharp-tailed Sandpiper	106		**106**			
Curlew Sandpiper	6		**6**			
Pied Oystercatcher						
Sooty Oystercatcher						
Black-winged Stilt						
Banded Stilt						
Pacific Golden Plover	3	28	**31**	1		**1**
Red-capped Plover	35	4	**39**	53	11	**64**
Double-banded Plover				9	19	**28**
Lesser Sand Plover	9		**9**			
Black-fronted Dotterel						
Red-kneed Dotterel						
Masked Lapwing	2	5	**7**	12	9	**21**
TOTAL	**514**	**193**	**707**	**405**	**45**	**450**

Comparisons of the AWSG survey results across all 3 years shows that the winter counts were reasonably consistent each year – tallies of 350-450 birds and with 7-9 of the species being migratory shorebirds. The records for over-wintering (immature) birds seem quite significant, especially those for the small to medium sized shorebirds such as Grey-tailed Tattler, Ruddy Turnstone, Red-necked Stint. There are very few winter records of these from elsewhere in the Hunter Region.

The summer counts varied much more greatly, and around twice as many shorebirds were recorded in 1982 compared to the following 2 years. The greatest contribution to the differences is the counts of Bar-tailed Godwit and Eastern Curlew over the 3 years (counts of 1400+, ~50 and ~300 birds). In 2004, many of these birds were found roosting at sites that are less accessible to land based surveys. One could speculate that this is where the birds were in 1983 and 1984. This serves to highlight the value of the water-based 2004 survey and the worth in repeating it regularly.

7. 1979/80 Ebb Tide Survey of Northern Port Stephens and Lower Myall River

During the summer of 1979/80, an ebb tide survey of part of Port Stephens was carried out (Pegler, 1980). The survey, which was done by boat, covered the shoreline from Karuah to Yacaaba Head and also included the lower Myall River, as far as Monkey-jacket (~4km upstream of Tea Gardens). An initial reconnaissance survey in October 1979 suggested that Carrington (near Tahlee) was the western limit of feeding shorebirds (in the area surveyed). The main survey was conducted over two weekends in December 1979 and January 1980.

Because of the survey method, the possibility of double counting cannot be excluded. Nevertheless, the results of it provide several valuable insights. Nine distinct locations for feeding shorebirds were found. These locations (listed eastwards from the westernmost site), and the dates when birds were counted, are as follows:

26 October 1979	Carrington (site 1)
14 January 1980	Bundabah (site 2)
13 January 1980	Lower Pindimar (site 3)
13 January 1980	Orungall Point (site 4)
14 January 1980	Wobbegong Bay (site 5)
16 December 1979	Limestone/West Corrie Island (site 6)
14 January 1980	Corrie Island sandspit (site 7)
16 December 1979	Winda Woppa (site 8)
15 December 1979	Lower Myall River (site 9)

The numbers of birds counted at each of these sites is given in Table 13. The total number is 978 shorebirds but the possibility of some double counting must be taken into consideration. It is possible to estimate the minimum number of birds present for each of the species, by summing the counts of them recorded in any one day and taking the maximum of such tallies. Provided that there was no disturbance on the day this approach is valid. The actual number of birds that were present is therefore from within the range of the minimum and maximum tallies. At least 689 shorebirds were present, on this basis.

Pegler commented on the roosting behaviour for some of the species surveyed. Many species merely walked to beyond the high tide mark close to their feeding sites, and roosted there. The Grey-Tailed Tattler flew to mangroves between Lower Pindimar and Orungall Point, and the larger shorebirds (Eastern Curlew and Bar-tailed Godwit) to the Corrie Island sandspit. Some Eastern Curlew also roosted in the mangroves of Swan Bay.

The count of 235 Grey-tailed Tattler feeding and roosting in the Lower Pindimar area in January 1980 is of much interest. It is by far the greatest count of this species for Port Stephens and also for the Hunter Region generally. There is no known record of >100 birds for the Hunter Estuary, for example. It must be noted that in the February 2004 high tide survey, the boat was not able to approach closer than 80-100m from the shoreline of Pindimar Bay. Had any Grey-tailed Tattler been roosting in the mangroves in that survey, they most likely would not have been observed from the boat. It would be of considerable interest to visit the Pindimar Bay area at low tide again (or to walk along the shoreline at high tide) and investigate if Grey-tailed Tattler are present.

Table 13 Shorebirds Recorded in 1979/80 Ebb Tide Survey

Species	Range	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9
Bar-tailed Godwit	200-269			200				23	31	15
Whimbrel	15-19			15		2	1	1		
Eastern Curlew	45-149	7	1	36		4	23	40	2	36
Common Greenshank	1									1
Terek Sandpiper	1				1					
Grey-tailed Tattler	235-245			235			10			
Red Knot	3			1	2					
Sanderling	1							1		
Red-necked Stint	44-64			7	13			44		
Sharp-tailed Sandpiper	4								4	
Sooty Oystercatcher	2								2	
Pacific Golden Plover	50-67							17	50	
Red-capped Plover	24-32			15	9			5	3	
Lesser Sand Plover	53-99				53			26	20	
Greater Sand Plover	3-6				3				3	
Masked Lapwing	8-16			2	2	8				4
TOTAL	**689-978**	**7**	**1**	**511**	**83**	**14**	**34**	**157**	**115**	**56**

The count of 50 Pacific Golden Plover in December 1979 is the greatest known record for Port Stephens although it is in line with records of 30-40 birds at Swan Bay in 1983 and 1984. Three Greater Sand Plover were recorded in December 1979 and probably the same birds again in January 1980. This seems to be the only known record of the species in Port Stephens although Bartrim notes it as a possible rare visitor to some areas (see following section). The counts for all other species are in line with other records for them from the 1970's and 1980's.

The 1979/80 survey covers approximately the same shoreline as was surveyed in Areas A and B of the February 2004 systematic high tide survey of Port Stephens. It is of some interest to compare the two sets of data. The total counts are similar despite the 24 year intervening period – 819 birds in 2004 compared to 689-978 birds in 1979/80 (see Table 14). However, the counts of individual species generally are quite different in the two counts, with the exceptions of Whimbrel, Eastern Curlew and Masked Lapwing. This perhaps suggests that changes have occurred in the utilisation by shorebirds of the Pindimar Bay area. However, it is not possible to draw any definitive conclusions from two one-off surveys done at different tide times and with unknown seasonal factors potentially influencing the behaviour of the various species.

Table 14 Comparison of Northern Port Stephens Shorebird Counts

Species	1979/80 Range (Ebb tide)	2004 Count (High tide)
Black-tailed Godwit	0	50
Bar-tailed Godwit	200-269	463
Whimbrel	15-19	25
Eastern Curlew	45-149	184
Common Greenshank	1	0
Terek Sandpiper	1	0
Grey-tailed Tattler	235-245	0
Red Knot	3	0
Sanderling	1	0
Red-necked Stint	44-64	0
Sharp-tailed Sandpiper	4	0
Pied Oystercatcher	0	75
Sooty Oystercatcher	2	14
Pacific Golden Plover	50-67	0
Red-capped Plover	24-32	0
Lesser Sand Plover	53-99	0
Greater Sand Plover	3-6	0
Masked Lapwing	8-16	8
TOTAL	**689-978**	**819**

8. Data from Pipeclay Creek Nature Reserve Proposal

In the late 1970's and early 1980's consideration was being given to the establishment of a new Nature Reserve within Port Stephens. The proposed Pipeclay Creek Nature Reserve was to have been located towards the western side of Port Stephens including locations such as Yalimbah Creek, Wirrung Island, Swan Island, Reedy Creek, Davis Point, Cockle Shell Point, Big Swan Bay, Twelve Mile Creek, Snapper Island. These locations included habitat that was suitable for shorebirds.

The supporting documentation generated for the (unsuccessful) proposal included a report that considered the resources of the area. In the discussion about habitat it was noted that the area now known as Worimi Nature Reserve was the prime roosting site for shorebirds within the then-proposed Pipeclay Creek Nature Reserve, with up to 400 Eastern Curlew and numbers of other species found at this site at high tides. This is quite consistent with the counts of Eastern Curlew there in recent times.

The Pipeclay Creek resource study contained data about 12 species of shorebird (plus a questioned record for Greater Sand Plover). The shorebird data from the report are presented in Table 15. As only one other record for Greater Sand Plover in Port Stephens has been identified in the course of preparing the present report, it seems advisable to discount the record in the Pipeclay Creek report.

Table 15 Pipeclay Creek N.R. Shorebird Data

Species	Numbers present	Frequency	Time of year	Location(s)
Bar-tailed Godwit	1-15	Common	Jan-Dec	Wirrung, Worimi
Whimbrel	1-60	Common	Jan-Dec	Widespread
Eastern Curlew	2-400	Often	Jan-Dec	Widespread
Ruddy Turnstone	1	Rare	Oct	Worimi
Red-necked Stint	10-50	Common	Jan-Dec	Worimi
Sharp-tailed Sandpiper	2-15	Common	Jan-Dec	Several locations
Black-winged Stilt	2	Rare	Jun, Aug	Worimi
Pacific Golden Plover	1-10	Common	Dec-Sep	Worimi
Red-capped Plover	1-80	Common	Jan-Dec	Worimi
Double-banded Plover	1-150	Common	Mar-Sep	Worimi
Lesser Sand Plover	1-150	Common	Sep-Mar	Worimi
Masked Lapwing	1-4	Common	Jan-Dec	Widespread

Records of Greater Sand Plover *Charadrius leschenaultii* were also noted (10-30 birds, Rare) but these were questioned by the author of the report.

9. Other Port Stephens Shorebird Records held by HBOC

Since it formed in 1976, HBOC has arranged a small number of outings to the Port Stephens area, some of which included visits to habitat where shorebirds might be encountered. Also, prior to commencing to publish Hunter Region Bird Reports in 1993, an observation book was available at the Club's monthly meetings for members to record what they considered to be interesting observations.

These two sources of data have been reviewed, producing the records presented below (for the period up to 1993, all the later records are captured into the Bird Reports that have been discussed previously). It is important to note the limitations to the data:

- Birds not always counted and/or counts were not recorded
- Counts were not made systematically and therefore may be an under-estimate
- Locations were not well defined and the surveys often may have involved visits to several locations around Port Stephens, with only the total count recorded

Despite these limitations, the data are nonetheless very valuable historic records of the past Port Stephens shorebird population. In the details provided below, locations are indicated if known, however, several of the records are imprecisely noted as being for "Port Stephens".

Black-tailed Godwit:

1984: Some birds in July

Bar-tailed Godwit:

1981: Some birds on January 18, 34-35 birds at Swan Bay in November

1984: Some birds in December

1985: Some birds on April 21

1990: Some birds in April

1993: 21 birds in January

2002: 50+ birds in July

Whimbrel:

1980: 4 birds at Malabula on June 28

1981: Some birds on January 18, single bird in November

1985: Some birds on April 21

1993: 27 birds in January

2002: 4 birds in July

Eastern Curlew:

1981: Some birds on January 18 and in November

1984: Some birds in December

1990:Some birds in April

1993: 700 birds in January

1999: 4 birds on October 24

2002: 20+ birds in July

Common Sandpiper:

1980: Unknown number recorded at Lemon Tree Passage in December

1981: Single bird on January 18, unknown number recorded at Swan Bay in December

Grey-tailed Tattler:

1981: 45 birds in November

1984: Some birds in July and December

1985: Some birds at Taylors Beach on April 21

1990: Some birds in April

2002: 4 birds in July

Ruddy Turnstone:

1982: 3 birds at Swan Bay on July 10

1990: Some birds in April

Red-necked Stint:

1980: 5 birds at Taylors Beach on June 28

1981: Some birds at Taylors Beach on January 18, some birds in November

1984: Some birds in December

1990: Some birds in April

Sharp-tailed Sandpiper:

1981: Some birds at Taylors Beach on January 18

1984: Some birds in December

Bush Stone-curlew:

1980: 2 birds at Taylors Beach June 28 and 2 birds at Bulls Island off Lemon Tree Passage November 1

Pied Oystercatcher:

1984: Some birds recorded by HBOC in December. Also, Smith (1990) notes a record of 63 birds in Port Stephens in 1984.

2002: 4 birds in July

Red-necked Avocet:

1980: Single bird at Taylors Beach November 1

Pacific Golden Plover:

1981: 12 birds at Taylors Beach on January 18

1984: Some birds in December

1985: Some birds in April

Grey Plover:

1980: Single bird at Taylors Beach November 1

Red-capped Plover:

1980: 9 birds at Taylors Beach on June 28

1981: Some birds at Taylors Beach on January 18

1984: Some birds in December

1985: Some birds at Taylors Beach on April 21

2002: Some birds in July

Double-banded Plover:

1980: 9 birds at Taylors Beach on June 28

1985: Some birds at Taylors Beach on April 21

1988: 10 birds at Taylors Beach August 20

1990: Some birds in April

2002: 24 birds in July

Lesser Sand Plover:

1981: Some birds in November

Masked Lapwing:

1981: Some birds in November

1984: Some birds in December

1985: Some birds at Taylors Beach on April 21

1990: Some birds in April

2002: Some birds in July

10. A 1991 Perspective of Port Stephens

Smith (1991) is a benchmark study spanning 1970-1990 records for 42 wetlands identified as key shorebird sites in southern and northern coastal NSW. The sites where his Port Stephens data were collected included the Lower Myall and Karuah Rivers, Tilligerry Creek and the adjacent coastline and the study area therefore closely similar to those reported in this investigation. Smith identified for each of the 42 wetlands those species which recorded a maximum count during the study period 1970-1990 of >1% of the national population of that species. The Watkins (1993) National Plan for Shorebird Conservation in Australia subsequently classified species which could be classified as of National and International Importance. The Smith data has some limitations but it is the only comprehensive study for that period available and it places Port Stephens in a comparative context with 42 key shorebird wetlands in southern and northern NSW. The study recorded only the maximum count for a site over the period 1970-1990, without indicating in which of those 20 years it was recorded, nor what variations occurred between years.

Port Stephens, including the lower Myall and Karuah Rivers, Tilligerry Creek and the adjacent coastline, was nominated by Smith as a Priority 2 site for NSW, one of only five such sites (the only nominated Priority 1 site was the Hunter River estuary). Priority 2 sites were those that supported 3 or 4 species with maximum counts of > 1% of the national population. The reason for the nomination of Port Stephens as a Priority 2 site was:

> *"The most important NSW site for the Whimbrel, and one of the two most important sites for the Eastern Curlew. Both these species and the Pacific Golden Plover have been recorded in numbers over the 1% level. The estuary also supports a remnant population of Bush Stone-curlews. It is a large estuary which has only been partly covered in most surveys. Wader numbers may well be larger than indicated."*

High counts in Port Stephens for four shorebird species were reported:

Pacific Golden Plover: 76 birds in 1980 (around 1% of the estimated Australian population of 7,000 birds, and 4% of the estimated NSW population of 1,800 birds).

Eastern Curlew: 960 birds in 1982 (around 5% of the estimated Australian population of 19,000 birds, and 40% of the estimated NSW population of 2,400 birds).

Whimbrel: 260 birds in 1982 (2.6% of the estimated Australian population of 10,000 birds, and 37% of the estimated NSW population of 700 birds).

Grey-tailed Tattler: 245 birds in 1980 (0.7% of the estimated Australian population of 36,000 birds, and 27% of the estimated NSW population of 900 birds).

11. Discussion

The following discussion is primarily focussed on the shorebirds of Port Stephens since the bulk of the data available and considered in this Report relates to them. Where appropriate, some discussion about other wetland locations, waterbirds and/or about species listed as Endangered, or Vulnerable under the NSW Threatened Species Conservation Act has been included.

The significance of Port Stephens for shorebirds should be evaluated in the context of declining populations of shorebirds world wide, declining populations in the nearby Hunter Estuary and the major threats to the viability of the total shorebird community in the Hunter Estuary Ramsar site due to proposed alienation of critical habitat for industrial developments.

11.1. Shorebirds of Port Stephens

32 species of shorebird are known to have been recorded in Port Stephens – 22 migratory species and 10 species that are breeding residents in Australia.

Table 16 Port Stephens Shorebirds 1970-2004

Migratory Species	Australian Resident Species
Black-tailed Godwit	Bush Stone-curlew
Bar-tailed Godwit	Pied Oystercatcher
Whimbrel	Sooty Oystercatcher
Eastern Curlew	Black-winged Stilt
Marsh Sandpiper	Banded Stilt
Common Greenshank	Red-necked Avocet
Wood Sandpiper	Red-capped Plover
Terek Sandpiper	Black-fronted Dotterel
Common Sandpiper	Red-kneed Dotterel
Grey-tailed Tattler	Masked Lapwing
Ruddy Turnstone	
Red Knot	
Sanderling	
Red-necked Stint	
Pectoral Sandpiper	
Sharp-tailed Sandpiper	
Curlew Sandpiper	
Pacific Golden Plover	
Grey Plover	
Double-banded Plover	
Greater Sand Plover	
Lesser Sand Plover	

11.2. Analysis of Status of Shorebird Species

Black-tailed Godwit: This species is protected under the Bonn Convention, (Bonn), CAMBA and JAMBA. It listed as Vulnerable under the NSW Threatened Species Act. Smith (1991) recorded only a single bird 1970-1990. It now seems to be an uncommon species in Port Stephens, with only a small number of records mostly of <5 birds. The count of 51 birds in February 2004 is easily the highest on record. However, the status for the species must be considered to be uncertain in Port Stephens. The February 2004 roost site is one that is not readily accessible; also identification from Bar-tailed Godwit is not easy for inexperienced observers. More research into the status in Port Stephens is warranted (particularly given its Vulnerable status).

Bar-tailed Godwit: This species is protected under Bonn, CAMBA and JAMBA. It is a common and abundant shorebird of Port Stephens, with around 0.5% of the total population of the sub-species *baueri* visiting in summer and substantial numbers of young birds over-wintering. Birds have been recorded at locations all around Port Stephens – either feeding or roosting. The well known roost site at Worimi N.R. actually only usually hosts some 20-30% of the total population present in summer. It would be very useful to have much better understandings of what are all the other roost sites and what are the factors that lead to any of them being selected.

Whimbrel: It is protected under Bonn, CAMBA and JAMBA. A maximum of 260 birds, recorded at Swan Bay in 1982, represented 2.6% of the Australian migrating population (sub-species *variegatus*), causing the population to be listed as of National Importance in the National Plan for shorebird conservation in Australia (Watkins 1993). Most recent evidence would suggest that there has been a decline but it remains a common though generally not abundant shorebird of Port Stephens. The majority of records are of <20 birds; the exceptions being the 260 birds recorded in 1982 and 218 birds recorded overall on 8 February 2004. However, the behaviour of the species needs to be taken into account. When feeding, birds are widely distributed and non-systematically collected records will suggest low numbers are present. When roosting, the birds prefer mangrove areas which are not readily accessible to observers nor are the birds readily detected there. Also, if disturbed when roosting they tend to flush in small groups leading to an under-estimated count.

Most of the birds present in February 2004 were roosting in mangroves, in an area not usually visited by bird observers. It is quite possible that 200+ birds are regularly present in Port Stephens in summer. Further investigations seem to be warranted.

Eastern Curlew: The species is protected under Bonn, CAMBA and JAMBA. Smith recorded a maximum 1970-1990 of 960 birds, compared with the Hunter Estuary maximum of 1000 birds, both representing >1% of the Australian population at that time and thus of International Importance (Watkins 1993). It is still a common and abundant shorebird of Port Stephens. The count of 649 birds on February 2004 represents 1.7% of the total world population for this species, thus Port Stephens continues to be an internationally significant location for it, particularly in the context of its declining world population. The 2004 count is consistent with a record of 700 birds in Port Stephens area January 1993. Also, in the February 2004 survey, 455 of the birds were in the Swan Bay area, which is consistent with the maximum counts at Worimi N.R. over 2000-2004. It is also consistent with a record of 418 birds in February 1985 (thought to be from Swan Bay). Thus, it seems that 600-700 birds are regularly present in Port Stephens during summer.

Marsh Sandpiper: It is protected under Bonn, CAMBA and JAMBA. Smith recorded only a single bird for the period 1970-1990. and is rare in Port Stephens, with the only known record being of a single bird at Swan Bay in February 1984, probably the record referred to in the Smith report.

Common Greenshank: It is protected under Bonn, CAMBA and JAMBA. A maximum count of 14 birds during the period 1970-1990 was reported by Smith, compared with 561 birds (> 1% of the Australian population) in the Hunter Estuary at that time. This is an uncommon species in Port Stephens. Apart from two records of 20-25 birds in November 1994 (possibly these birds were in transit), and Smith's data, the small number of other records are of single birds. No birds were recorded in the systematic survey of all of Port Stephens on 8 February 2004.

Wood Sandpiper: It is protected under Bonn, CAMBA and JAMBA. Smith recorded only a single bird for Port Stephens over the 1970-1990 period of his survey, compared with 6 birds recorded for the Hunter Estuary. There are no other known Port Stephens records. It is a species which prefers fresh water habitat and the Port Stephens record probably represents an accidental visit.

Terek Sandpiper: . It is protected by Bonn, CAMBA and JAMBA and is classified as Vulnerable under the NSW Threatened Species Conservation Act. A maximum of only 2 birds was recorded in the 1970-1990 study by Smith (1991). There are only two known recent records – of six birds at Oyster Cove in February 2004 and 6+ birds in the Tilligerry Peninsula area in May 1997. It seems clear that the species is not abundant in Port Stephens. However, it is not clear whether birds are regularly or irregularly present. The only systematic survey done to date revealed that some birds were present. Further systematic surveys are recommended in order to better understand the occurrence and requirements in Port Stephens of this species. Because of its status as Vulnerable, it is important that management plans for Port Stephens properly reflect the needs of the Terek Sandpiper.

Common Sandpiper: It is protected under Bonn, CAMBA and JAMBA. Smith recorded a maximum of only 2 birds 1970-1990, compared with 11 birds in the Hunter Estuary and it is still regarded as an uncommon species in Port Stephens. There are very few known records and these probably represent only 1-2 birds (numbers were not always noted in the records available). It is not clear whether birds are regularly or irregularly present – further systematic surveys are required to clarify this.

Grey-tailed Tattler: It is protected under Bonn, CAMBA and JAMBA. The Smith report recorded a higher maximum (245) for Port Stephens, than in the Hunter Estuary (100) for 1970-1990. Current records have been far less, as is the case also in the Hunter Estuary, representing a probable population decline in both locations. However, the mostly opportunistic records that are available may lead to under-estimates of the actual population in the Port, since it can be difficult to locate and then count this species. The 1982 record included at least 235 birds seen feeding at low tide around Pindimar Bay – such surveys have not been repeated (and the species can be difficult to locate at its high tide roosts).

The present status seems to be that Grey-tailed Tattler is regularly present in Port Stephens, including up to 20 over-wintering birds in most years. The summer counts are typically of 30-50 birds, and peak counts have been of 50-80 birds. These are quite notable counts for the Hunter Region (for example, typical counts in the Hunter River Estuary in recent years are of 20-40 birds). The winter counts at Swan Bay/Worimi Nature Reserve are also quite notable. There are few winter records from elsewhere in the Hunter Region. These records are of immature birds and it is important to understand more about their feeding and roosting

requirements. Also, most of the birds recorded on 8 February 2004 were roosting in mangroves in an area not readily accessible to bird observers. Winter surveys to this area are strongly recommended.

Ruddy Turnstone: It is protected under Bonn, CAMBA and JAMBA. Smith recorded a maximum count of 4 birds for 1970-1990 in Port Stephens (compared with 520 birds in the Hunter Estuary). There are very few records since for this species, the six birds present in February 2004 representing the highest known summer count. Of much greater significance are the winter records – a single bird in June 2003, 3 birds in July 1982 and 20 birds in June 1984. There are few winter records from elsewhere in the Hunter Region, and it would be informative to conduct some systematic winter surveys of Port Stephens.

Red Knot: The species is protected under Bonn, CAMBA and JAMBA. The maximum record for the Smith 1970-1990 survey was only 3 birds, (compared with 1000 for the Hunter Estuary) and there have been very few records for Port Stephens since, although some birds appear to stage in the area during their passage migration to New Zealand. It would be useful to conduct a systematic survey of all of Port Stephens in late September or early October, the peak migration period for the species, to see if greater numbers are present at such times.

Sanderling: It is protected under Bonn, CAMBA and JAMBA and is classified as Vulnerable under the NSW Threatened Species Conservation Act.. Smith recorded a maximum count of a single bird in 1970-1990 – this presumably corresponds to the only one known detailed record, of a single bird on Corrie Island in 1980. This species has a preference for ocean shores where the wave action is greater.

Red-necked Stint: It has a declining world population and is protected under Bonn, CAMBA and JAMBA. Smith recorded a maximum of 116 birds in 1970-1990 in Port Stephens (compared with 540 in the Hunter Estuary). In recent times, up to 20 birds appear to be regularly present in the Port in summer, with greater numbers sometimes occurring, but no reported records of 100 or more since 1990, consistent with the decline in population found in the Hunter Estuary. The count of 53 birds in January 2002 is a notable one in the context of the overall Hunter Region in recent years. However, the recent counts suggest a decline in numbers since the 1980's, when for example 100-150 birds were recorded in the summers of 1982-1984.

Also notable for the Hunter Region is that some birds over-winter in Port Stephens, and this seems to be a consistent behaviour over 20+ years. There are very few winter records from elsewhere in the Region since the 1980's. It would be informative to conduct some systematic winter surveys of Port Stephens.

Pectoral Sandpiper: It is protected under Bonn and JAMBA. Smith recorded only a single bird in the period 1970-1990 (compared with the Hunter Estuary 10 birds). Since then, there is only one known record of this species for Port Stephens, when four birds were present at Worimi N.R. in December 2001. The record can be considered a significant one, since the Hunter Estuary population has declined and the species is considered rare in the Hunter Region, with infrequent reports occurring, mostly being of single birds.

Sharp-tailed Sandpiper: The species is protected under Bonn, CAMBA and JAMBA. Smith recorded a maximum of 406 birds in 1970-1990, compared with 1065 birds for the Hunter Estuary. In 1983 and 1984, counts were 100-200 birds. However, it is now an uncommon species in Port Stephens, with a small number of records, all of these being for the summer months, and with the peak count being of 22 birds. It is possible that birds are not present every year. Additional systematic surveys of the whole of Port Stephens would help to clarify whether it represents a declining population, whether it is only an intermittent visitor in large

numbers to a few localities or whether it is widely dispersed in small numbers through Port Stephens habitats. In contrast with Port Stephens, recent counts in the Hunter Estuary have been of the order of 1000 birds or more, but concentrated mainly on Ash Island and in Hexham Swamp.

Curlew Sandpiper: The species has a declining world population and is protected under Bonn, CAMBA and JAMBA. Smith reported a maximum of 30 birds in Port Stephens 1970-1990 (compared with 4000 in the Hunter Estuary, >1% and declared of International Importance by Watkins (1993)). Curlew Sandpiper seems to be rare in Port Stephens, with only 5 known records. The peak count is of 30 birds in February 1982, probably the one reported by Smith – all other counts have been of 10 birds or fewer. There are two winter records, both of single birds at Swan Bay in the 1980's. The decline in Port Stephens is consistent with a decline in the Hunter Estuary, and even though numbers are small, it is a matter of concern in the context of being also in decline globally.

Bush Stone-curlew: The species is listed as Endangered under the NSW Threatened Species Conservation Act. None were reported 1970-1990 by Smith (1991). It is an uncommon resident of Port Stephens, with several records of at least one pair since Smith's study and also with some breeding records. Because of the spread of locations from which there are records, it is very likely that there is more than one pair present. The records are significant, because of its Endangered status.

Pied Oystercatcher: The species is listed as Vulnerable under the NSW Threatened Species Conservation Act. Port Stephens had the highest maximum count of the 21 northern NSW coastal wetlands surveyed 1970-1990 by Smith (1991), with 63 birds, compared with 27 birds in the Hunter. It is a common species in Port Stephens, with regular records of pairs or small parties from widespread locations. The 8 February 2004 survey also identified three very important roosting sites (Oyster Cove, Winda Woppa, oyster leases near Swan Bay) where larger parties were congregated. Just on 1% (112 birds) of the total population of the species was present in the 2004 survey, making Port Stephens a significant national location for Pied Oystercatcher. The numbers also correspond to around 40% of the estimated NSW population. It is probable that they mostly were immature birds, which are known to congregate into medium to large flocks. Thus, Port Stephens seems to have an important role in the survival of young NSW birds to maturity.

Additional knowledge about the feeding and roosting requirements in Port Stephens is needed, so that management plans can be sure to be effective for the Vulnerable species.

Sooty Oystercatcher: The species is listed as Vulnerable under the NSW Threatened Species Conservation Act. A maximum of 4 birds was recorded by Smith during 1970-1990, compared with only 2 birds for the Hunter Estuary. Only 9 of the 21 wetlands in the northern NSW sample recorded any of the birds and only 3 had double figure counts, an indication of the state of its vulnerability. It is a non-breeding resident in Port Stephens, with frequent records of pairs or small parties from widespread locations. There are two known records of groups of 8 roosting birds – at Worimi N.R. in August 2002 and Garden Island in February 2004. Sooty Oystercatcher breed almost exclusively on off-shore rocks and islands and the birds occurring at Port Stephens are expected to be immatures. The Port Stephens habitat therefore is important for ensuring the survival of these to maturity.

In order that management plans can be sure to be effective for the protection of this NSW Vulnerable species, it is highly important that additional knowledge about the feeding and roosting requirements in Port Stephens be gathered.

Black-winged Stilt: A maximum count of 16 birds was reported by Smith (1991), compared with 1209 birds for the Hunter Estuary. This seems to be an uncommon if not rare visitor to the Port Stephens habitat. There are only 3 known recent records – all of <20 birds and recorded at Swan Bay/Worimi N.R. (1982 and 2001). However, because the species is generally common in the Hunter Region overall, casual observations of small groups of birds quite likely would not be reported. No birds were recorded in the February 2004 survey; however, only 92 birds were recorded in the Hunter River Estuary on the previous day (that is, the Port Stephens survey was done at a time when birds seem to have departed generally from the Hunter Region).

Banded Stilt: Smith did not record any records of the species in Port Stephens 1970-1990, compared with 11 birds for the Hunter Estuary. No other records were reported for northern NSW wetlands. It is an accidental or rare visitor to Port Stephen, with the only known records being of single birds present in September-October 2000 and January 2001. Records in the Hunter Estuary have been similarly sparse, with only 1-2 birds recorded in 1993-1996 and 2000-2002.

Red-necked Avocet: Only a single bird was identified by Smith during 1970-1990 in Port Stephens, compared with the Hunter Estuary's count of 2000 birds. This is an accidental or rare visitor to Port Stephens, with the only known record being of a single bird present in November 1980, the likely source of Smith's record.

Pacific Golden Plover: This species is protected under Bonn , CAMBA and JAMBA. It was well represented in Smith's survey, with Port Stephens registering a maximum of 76 birds and the Hunter Estuary 800 birds, both counts representing >1% of the Australian population. Five other of the 21 wetlands in his northern NSW sample also registered > 1%. The status of this species in Port Stephens now is somewhat uncertain and as in the Hunter Estuary, represents a population in significant decline. It probably is regularly present in summer in modest numbers, and with some birds often over-wintering. However, the situation is not fully clear. 1-10 birds have often been present (summer and winter) at Worimi N.R. between September 2000 and July 2003 and with peak counts of 29-30 birds during January-February 2003. These latter counts match with records of 30-40 birds at Swan Bay in 1983 and 1984. No birds have been recorded at Worimi N.R. since July 2003 nor were any recorded in all of Port Stephens in the February 2004 survey. Since 1984, there have only been occasional records.

The above winter records are notable for the Hunter Region, since there are few records from elsewhere. It should also be noted that there are matching winter records of 9 birds at Swan Bay in 1983 and a single bird there in 1984. Additional surveys of Port Stephens, including winter surveys, are needed in order to better understand the status in the area and to try to identify any local factors contributing to the decline evident since the 1970s. It is also recommended to include some low tide surveys, since at high tides the roosting birds can be difficult to locate/count.

Grey Plover: It is protected under Bonn, CAMBA and JAMBA. Smith recorded only a single bird during 1970-1990, compared with 2 birds for the Hunter Estuary. The species is an accidental visitor to Port Stephen, with the only known records being of a single bird present at Taylors Beach in November 1980 (probably the record accepted by Smith), and 3 at the mouth of the Myall River in January 2003. Historically there have been only infrequent records of 1-2 birds in the Hunter Estuary, with the most recent reports being for 2001 and 2002.

Red-capped Plover: Smith recorded a maximum of 120 birds during 1970-1990 in Port Stephens, the second highest count of the 21 northern NSW wetlands he surveyed, compared with 130 birds for the Hunter Estuary. The status of this species in Port Stephens probably should now be considered to be uncertain. Possibly, it is nomadic within the Hunter Region, hence appearing and disappearing in Port Stephens depending on the local conditions and the conditions elsewhere in the Region. In the Worimi N.R. surveys, birds have been recorded in 65% of the summer and winter surveys conducted, generally in modest counts, and a pair had a nest with eggs there in October 2000. Over the years there are several records of 40-70 birds at Swan Bay/Worimi N.R. alone; in contrast, however, no birds were recorded anywhere in Port Stephens in the systematic survey of 8 February 2004. This supports the pattern of a nomadic behaviour.

Double-banded Plover: This species was not mentioned in Smith (1991). It is a regular winter migrant to Port Stephens, mostly present over the months of April to August. Swan Bay/Worimi N.R. seems to be the most important location, with many records of 20-30+ birds over more than 20 years. Historically, Taylors Beach has also been a significant location and the peak count there is of 36 birds in June 1983 (making 69 birds known to be present at that time in Port Stephens). A systematic winter survey of all of Port Stephens would be useful in identifying the total number of birds utilising the area nowadays and the locations they prefer.

Greater Sand Plover: This species is protected under Bonn, CAMBA and JAMBA and is listed as Vulnerable under the NSW Threatened Species Conservation Act. Smith recorded a maximum of 6 birds in Port Stephens 1970-1990, compared with 31 birds in the Hunter. The Smith data is probably based on a 1979/80 ebb tide survey by Pegler when 3 birds were recorded twice in successive months. Bartrim suggested that 10-30 birds might be present in western Port Stephens on rare occasions but he did not confirm this. There have been no records of the species in Port Stephens since 1980 and the species quite likely is extinct in the Port (similarly, there have been no Hunter Estuary records for many years).

Lesser Sand Plover: This species is protected under Bonn, CAMBA and JAMBA and is listed as Vulnerable under the NSW Threatened Species Conservation Act. Smith recorded a maximum of 101 birds in Port Stephens 1970-1990, compared with 800 birds (> 1% of the national population) for the Hunter Estuary. It seems that this species was abundant in the Port Stephens area in the early 1970's and prior to then. For example, a report of 100 birds at Swan Bay in May 1971 was commented upon solely as being a late departure date. More recently, the numbers in Port Stephens have declined considerably, consistent with parallel decline in the Hunter Estuary. Records are infrequent and mostly of 1-5 birds. However, a peak count of 22 birds at Worimi N.R. in January 2001 indicates the potential of the Port Stephens habitat to support the species. All of the Port Stephens records are considered to be significant given the near extinction of the species in the Hunter River Estuary and its rank of Vulnerable.

Black-fronted Dotterel: Smith recorded a maximum of 14 birds for 1970-1990 for Port Stephens, compared with 63 birds for the Hunter Estuary. The current status of this species in Port Stephens is uncertain. There are very few records but it is a common resident of the Hunter Region generally and so casual observations of small numbers of birds are less likely to have been reported. Similar habitat to that recorded in the Hunter Estuary is available in Port Stephens. Additional systematic surveys are needed to clarify the situation.

Red-kneed Dotterel: Smith recorded a maximum of 15 birds in Port Stephens 1970-1990, compared with 63 birds for the Hunter Estuary. This is now regarded as an accidental or rare visitor to Port Stephens, the only known record being 15 birds at Swan Bay in July 1982, probably the record quoted by Smith. In the Hunter Estuary it has been recorded in both freshwater and estuarine habitat, similar to habitat available in Port Stephens.

Masked Lapwing: A maximum of 53 birds was recorded by Smith 1991, compared with 147 birds for the Hunter Estuary in 19970-1990. This seems to be a common resident of Port Stephens, although generally not recorded in large numbers. It has a preference for freshwater rather than tidal habitats.

11.3. Hunter Region Shorebird Species Not Recorded in Port Stephens

Most of the shorebirds known to occur in the Hunter Region, either as residents, regular or irregular visitors, have also been recorded in Port Stephens. A notable exception is Great Knot. From the information sources available to HBOC dating since the early 1970's, no records have been found for the following species:

Migratory Shorebirds

Hudsonian Godwit: An accidental visitor to the Region that has been recorded on very few occasions.

Little Curlew: An accidental to rare visitor to the Region that has been recorded on very few occasions. It has a preference for fresh to brackish waters.

Lesser Yellowlegs: An accidental visitor to the Region, recorded only once.

Wandering Tattler: An accidental visitor to the Region that has been recorded on very few occasions. Identification from Grey-tailed Tattler is difficult and it is possible that 1-2 birds have occasionally been present in Port Stephens but have been overlooked.

Asian Dowitcher: An accidental visitor to the Region, recorded only twice.

Great Knot: Generally uncommon in the Hunter Region, but often recorded in counts of 10-50 birds in the Hunter River Estuary and with several records of 1-5 birds from elsewhere in the Region (e.g. Swansea, Wallis Lake, Harrington). This is the most notable absentee from the list of the Port Stephens migratory shorebirds.

Broad-billed Sandpiper: An uncommon visitor that was sometimes recorded in large counts in the Hunter River Estuary in the 1970's but which now is only infrequently present.

Ruff: A rare visitor to the Region that is only recorded every few years.

Buff-breasted Sandpiper: An accidental visitor to the Region, recorded only twice.

Kentish Plover: An accidental visitor to the Region that has been recorded only once.

Oriental Plover: A rare visitor to the Region that has only been recorded on only a few locations.

Australian Resident Shorebirds

Beach Stone-curlew: An uncommon resident of the Region, often recorded in the area around the mouth of the Manning River (between Harrington-Old Bar) and known to breed there, but rarely recorded elsewhere around the Region.

Banded Lapwing: An uncommon visitor to the Region that is recorded irregularly, when inland conditions are unsuitable. It inhabits paddocks/grasslands with nearby water, and is not often found at shorelines.

11.4. Important Roosting Locations for Shorebirds

As yet there are insufficient data available to discuss the important feeding locations for shorebirds around Port Stephens (although the historic significance of the Pindimar Bay area should be noted). However, the February 2004 systematic survey of all of Port Stephens, together with the historic data available, allows some of the more important shorebird roosting locations to be identified. It must be strongly emphasised that there are likely to be additional locations that also are important even though they may have had relatively few or even no birds at them in February 2004. Shorebirds usually have more than one roost site, with many factors affecting where they select to roost at any particular time. These factors include the amount of disturbance at the site, time of day (especially in relation to nocturnal roosting), wind direction, weather conditions, proximity to current feeding area. Several more systematic surveys would be needed before a complete picture about the roosting sites began to emerge.

The known roosting sites of importance include:

Swan Bay/Worimi Nature Reserve: This location has been and remains a very important shorebird roost site. Typically, some 25-50% of the estimated total Port Stephens population of shorebirds roosts there. The historic records refer to Swan Bay – this is understood to include the area around the village as well, that is, a larger area than what is now known as Worimi Nature Reserve, The latter seemingly has always been where most of the birds were present.

Summer counts nowadays for the location are of 400-600 shorebirds, and the highest known count is of 1500+ birds there in February 1982. Winter counts have varied between 100 or so birds up to more than 500 of them. The predominant roosting species are Bar-tailed Godwit and Eastern Curlew, both large shorebirds. Many of the very small shorebirds also occur there, most notably the Double-banded Plover which is a winter migrant from New Zealand. Worimi N.R. is easily the most reliable known location for this species within all of the Hunter Region. In the past, notable counts of the other small shorebirds, Red-necked Stint and Red-capped Plover, have also been recorded at Worimi. Although the numbers in recent years are depleted in comparison, there still are frequent records. It is very important to note that the 2000-2004 surveys have shown that these birds usually are actively feeding there rather than roosting. Most likely, this has always been the case.

Taylors Beach: Historically, this as been an important site, with summer counts of 200-350 shorebirds and winter counts of 50-100 birds over 1982-1984. It apparently has not been surveyed since then by HBOC members, until the February 2004 survey. No shorebirds were there on that survey but many were roosting in some areas nearby. It seems quite possible that Taylors Beach remains an important roost site.

Corrie Island: In the February 2004 survey, over 25% of the total Port Stephens population of shorebirds were roosting on Corrie Island. There are very few other records but since the Island is inaccessible to bird observers except by boat, this is not surprising. Moderate numbers of shorebirds were recorded in three excursions to Corrie Island in 2001. The eastern and southern shores seem to provide the most favourable habitat for roosting.

Winda Woppa Point: 118 shorebirds were roosting at Winda Woppa Point in the February 2004 survey, including almost half of the total population in Port Stephens of the NSW Vulnerable species Pied Oystercatcher. The site is not easily accessed except by boat and does not seem to have been surveyed very often previously.

Oyster Cove: 117 shorebirds of 6 species (all migratory) were roosting on a rock jetty there in the February 2004 survey.

Mangroves between Soldiers Point and Tilligerry Creek: In the February 2004 survey, 159 Whimbrel and 44 Grey-tailed Tattler were roosting in mature mangrove trees in several places between Soldiers Point and the mouth of Tilligerry Creek.

Oyster leases and emergent posts: Very many shorebirds were found to be roosting on oyster leases off Tahlee, Oyster Cove and Swan Bay in the February 2004 survey. Oyster leases and emergent posts were also being used by many other waterbirds especially cormorants, gulls and terns. A similar situation occurred at the wrecks off Pindimar, with nearly 250 Pied Cormorant roosting on these. The large numbers of birds utilising these semi-submerged structures may be because of the unusually high tide on February 8 or may be associated with disturbance at other roosting sites – as is usual in summer, many people were visiting Port Stephens that weekend.

Quite likely, additional locations would be identified as being significant if further systematic surveys of Port Stephens were able to be done.

11.5. Vulnerable and Near-threatened Species

This report has identified the presence in Port Stephens of two Endangered species and eight species that are classified as Vulnerable under the NSW Threatened Species Conservation Act. These are listed in Table 17. As well, there are records for 15 species that have been classified as Near-threatened (Maddock 2003, Maddock and Stuart 2004). Such classification was made on the basis that the species was in known population decline internationally and/or in the Hunter Region. The near-threatened species are listed in Table 18. Probably the most significant of these is the Eastern Curlew which is considered to be in international decline: 1.7% of the total world population of the species was in Port Stephens in February 2004 and there are historic records of well in excess of 2% of the world population being present. With several hundred birds also present in the Hunter River Estuary, and the possibilities of interchange between the two areas, it may be that around 3% of the world population relies on the habitat of Port Stephens.

Table 17 NSW Endangered and Vulnerable Species Recorded in Port Stephens

Endangered	Vulnerable
Bush Stone-curlew	Osprey
Little Tern	Black-tailed Godwit
	Terek Sandpiper
	Sanderling
	Pied Oystercatcher
	Sooty Oystercatcher
	Greater Sand Plover
	Lesser Sand Plover

Table 18 Near- Threatened Species Recorded in Port Stephens

Great Egret	Ruddy Turnstone
Intermediate Egret	Red-necked Stint
Little Egret	Pectoral Sandpiper
Eastern Curlew	Sharp-tailed Sandpiper
Wood Sandpiper	Curlew Sandpiper
Common Sandpiper	Pacific Golden Plover
Grey-tailed Tattler	Grey Plover
	Double-banded Plover

11.6. Significance of Port Stephens Shorebird Habitat and Comparison to Hunter River Estuary Shorebird Habitat

Without doubt, Port Stephens is an important habitat for several species of shorebird. It supports species in decline globally (Eastern Curlew, Curlew Sandpiper, Red-necked Stint), other species which are in decline in the nearby Hunter Estuary (Black-tailed Godwit, Terek Sandpiper, Curlew Sandpiper, Red-necked Stint, Common Sandpiper, Grey-tailed Tattler, Ruddy Turnstone, Pacific Golden Plover), species listed as Endangered or Vulnerable under the NSW Threatened Species Conservation Act and species classified as Near Threatened because of small local populations or populations locally in decline.

Port Stephens is particularly important all year round for the larger species – godwits, curlews, whimbrels. A significant proportion of the total world population of Eastern Curlew apparently are present each summer in Port Stephens. Counts of 600-700 birds seem to occur often – this may be compared to the typical Hunter River Estuary ("Estuary") counts of 300-400 birds (although with greater numbers sometimes present). The counts of Bar-tailed and Black-tailed Godwit are higher in the Estuary than in Port Stephens (1000+ birds and 300-400 birds, respectively, in summer). The Whimbrel population in Port Stephens seems to be higher than in the Estuary but it must be noted that there have been no systematic surveys of mangrove areas (the favoured roosting habitat) in the Estuary.

There are some notable differences between the populations of medium sized shorebirds in Port Stephens and the Estuary in summer. Migratory birds such as Curlew Sandpiper, Marsh Sandpiper, Common Greenshank, Terek Sandpiper and Great Knot, and Australian resident birds such as Black-winged Stilt and Red-necked Avocet are commonly present and at least moderately abundant in the Estuary but they are generally absent from Port Stephens. This is also the case for Sharp-tailed Sandpiper, which in some years is present in large numbers in the Estuary (and some years virtually absent) – there are very few records from Port Stephens. In contrast, the February 2004 survey indicates that there are many more Pied and Sooty Oystercatcher in the Port Stephens environs. As both species are listed as Vulnerable in NSW this has been an important discovery. Most likely the Sooty Oystercatcher does not breed in Port Stephens but it is important to determine whether or not the Pied Oystercatcher does so. The recent counts of Grey-tailed Tattler also are slightly higher in Port Stephens although this might be because not all of the roosting sites in the Estuary are able to be accessed. There are quite high historic counts of Grey-tailed Tattler in Port Stephens.

In winter, for reasons that are unclear, the immature medium sized migratory shorebirds seem to favour Port Stephens over the Estuary (although the counts in either location are not especially high).

Port Stephens is also important for some small shorebirds. Far more Double-banded Plover occur there in winter than do in the Estuary. Counts of Red-capped Plover and Red-necked Stint seem generally to be comparable to or somewhat greater than for the Estuary.

An aspect that is not known is the extent of movements of birds between Port Stephens and the Estuary. Because of the distances involved, probably the small shorebirds generally do not move between the two places. However, the larger shorebirds might do this, because of disturbance or for feeding requirements.

12. Recommendations

The data available about shorebirds in Port Stephens strongly support that it is a important habitat for shorebirds in NSW. This finding should be viewed from the context of declining populations of shorebirds world wide, declining populations in the nearby Hunter Estuary and the major threats to the viability of the total shorebird community in the Hunter Estuary Ramsar site due to proposed alienation of critical habitat for industrial developments. Proper protection and management of Port Stephens for shorebirds and other waterbirds takes on a new level of importance. In the first instance, more and better data about the shorebird utilisation of Port Stephens is required. To date, there has been only one systematic survey of all of Port Stephens. All other data are based upon limited systematic surveys or casual observations. The one systematic survey, done in summer at high tide, provided a very valuable snapshot of the population and distribution of shorebirds within the Port.

HBOC makes the following nine recommendations:

1. Regular summer high tide surveys be undertaken for several more years, to build up a better picture of the annual variations and identify all of the important roost sites. These surveys ideally should be conducted in February to coincide with the summer counts by the NSW Wader Study Group. If done later, some of the visiting birds may have already departed.
2. A winter high tide survey should be undertaken, with a similar format to the summer surveys. The historic data available suggests that Port Stephens can have a substantial number of over-wintering migratory shorebirds (that is, immature birds that will not return to their breeding grounds until the following year). It is important to understand the present situation and develop an appropriate response. The winter survey (July or early August timing) would also measure the overall importance of Port Stephens to Double-banded Plover, a winter migrant from New Zealand that is considered now to be Near-Threatened.
3. Continue to use a water-based survey technique for the summer and winter high tide surveys, as they improve the accessibility to the potential roosting sites and maximise the coverage of the Port Stephens environs that can be effected.
4. Local Management Plans for the NSW Endangered and Vulnerable species identified as utilising Port Stephens should be reviewed in the light of the information presented in this Report, if such plans already exist. If they do not exist then they should be developed. For Pied Oystercatcher in particular, in view of the surprising number found to be present in February 2004, it is further recommended that to determine whether the species is breeding in Port Stephens.
5. In view of the importance locally of oyster leases and emergent posts for roosting shorebirds, such structures should be retained at least until it becomes clear that alternative roosting options are available for the birds.
6. Consideration be given to how a systematic low tide survey in summer could be conducted. The main aim of such survey would be to identify the important feeding locations for the large number of shorebirds that inhabit Port Stephens. Specific identifications of birds are of secondary importance therefore in such a survey. If it is unlikely to be possible to approach very close to shore in a water based low tide survey then consideration should be given to an aerial survey.

7. In view of the existence of some evidence that at least some shorebirds utilise the Port Stephens environs during passage migration to other places, consideration should also be given to conducting a high tide survey in spring (targeting the period around late September or early October).
8. Consideration be given to how the nocturnal high tide roost sites for the shorebirds could be identified. It is often the case that birds choose different day and night roosting sites (the latter seemingly based primarily on security considerations). Both the diurnal and nocturnal roosting site requirements need to be understood if effective management plans for shorebirds in Port Stephens are to be developed.
9. Consideration be given to conducting a study to identify if there is any movement of birds between Port Stephens and other feeding or roosting areas in particular the Hunter River Estuary. Such a study could be done by use of radio transmitters or by flagging of some birds. It would be easier initially to target the large shorebirds for such a study. For information about the potential for movement of birds, it may be helpful initially to undertake a detailed analysis of the existing count data for Bar-tailed Godwit and Eastern Curlew for Port Stephens and the Hunter River Estuary, and also to review the habitat usage of individual species and match these against the known habitats at both locations.

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15. Appendix: Scientific Names of Waterbirds Surveyed

Bird species are listed in taxonomic order; the order and nomenclature follows that of Christidis and Boles in the 1994 RAOU (Birds Australia) publication *The Taxonomy and Species of Birds of Australia and its Territories* (ISBN 0815-2233).

Black Swan *Cygnus atratus*
Pacific Black Duck *Anas superciliosa*
Chestnut Teal *Anas castanea*
Little Pied Cormorant *Phalacrocorax melanoleucos*
Pied Cormorant *Phalacrocorax varius*
Little Black Cormorant *Phalacrocorax sulcirostris*
Great Cormorant *Phalacrocorax carbo*
Australian Pelican *Pelecanus conspicillatus*
White-faced Heron *Egretta novaehollandiae*
Little Egret *Egretta garzetta*
White-necked Heron *Ardea pacifica*
Great Egret *Ardea alba*
Intermediate Egret *Ardea intermedia*
Striated Heron *Butorides striatus*
Nankeen Night Heron *Nycticorax caledonicus*
Australian White Ibis *Threskiornis molucca*
Royal Spoonbill *Platalea regia*
Osprey *Pandion haliaetus*
Whistling Kite *Haliastur sphenurus*
White-bellied Sea-Eagle *Haliaeetus leucogaster*
Wedge-tailed Eagle *Aquila audax*
Black-tailed Godwit *Limosa limosa*
Bar-tailed Godwit *Limosa lapponica*
Whimbrel *Numenius phaeopus*
Eastern Curlew *Numenius madagascariensis*
Marsh Sandpiper *Tringa stagnatilis*
Common Greenshank *Tringa nebularia*
Terek Sandpiper *Xenus cinereus*
Common Sandpiper *Actitis hypoleucos*
Grey-tailed Tattler *Heteroscelus brevipes*
Ruddy Turnstone *Arenaria interpres*
Red Knot *Calidris canutus*
Sanderling *Calidris alba*
Red-necked Stint *Calidris ruficollis*
Pectoral Sandpiper *Calidris melanotos*
Sharp-tailed Sandpiper *Calidris acuminata*
Curlew Sandpiper *Calidris ferruginea*
Bush Stone-curlew *Burhinus grallarius*
Pied Oystercatcher *Haematopus longirostris*
Sooty Oystercatcher *Haematopus fuliginosus*
Black-winged Stilt *Himantopus himantopus*
Banded Stilt *Cladorhynchus leucocephalus*
Red-necked Avocet *Recurvirostra novaehollandiae*
Pacific Golden Plover *Pluvialis fulva*
Grey Plover *Pluvialis squatarola*
Red-capped Plover *Charadrius ruficapillus*
Double-banded Plover *Charadrius bicinctus*
Lesser Sand Plover *Charadrius mongolus*
Greater Sand Plover *Charadrius leschenaultii*
Black-fronted Dotterel *Elseyornis melanops*
Red-kneed Dotterel *Erythrogonys cinctus*
Masked Lapwing *Vanellus miles*
Arctic Jaeger *Stercorarius parasiticus*
Silver Gull *Larus novaehollandiae*
Gull-billed Tern *Sterna nilotica*
Caspian Tern *Sterna caspia*
Crested Tern *Sterna bergii*
Common Tern *Sterna hirundo*
Little Tern *Sterna albifrons*