

## THE STATUS OF GULL AND TERN SPECIES IN THE HUNTER ESTUARY

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The Hunter Estuary is well known for its importance for migratory and resident shorebirds but its relevance for other species that visit the estuary or that migrate within the East Asian–Australasian Flyway (Flyway) has been less clear. Systematic surveys in the estuary from 1999 to 2021 recorded one gull (Silver Gull *Larus novaehollandiae*) and nine tern species (Little Tern *Sternula albifrons*, Common Gull-billed Tern *Gelochelidon nilotica*, Australian Gull-billed Tern *G. macrotarsa*, Caspian Tern *Hydroprogne caspia*, Whiskered Tern *Chlidonias hybrida*, White-winged Black Tern *C. leucopterus*, White-fronted Tern *Sterna striata*, Common Tern *S. hirundo* and Greater Crested Tern *Thalasseus bergii*). No species was present in significant numbers relative to their estimated total populations. Vagrant species recorded in the same period were Pacific Gull *L. pacificus*, Sooty Tern *Onychoprion fuscatus* and Bridled Tern *O. anaethetus*. Several tern species undertake regular movements either within Australia or over a larger portion of the Flyway. Here, we analyse long-term trends for common species and compare numbers across seasons. We identified a statistically highly significant decrease in Silver Gull numbers and increases in five tern species, three of which, Australian Gull-billed Tern, Caspian Tern and Whiskered Tern, may have benefitted from the expansion of estuarine habitat through recent rehabilitation projects.

## INTRODUCTION

The Hunter Estuary is known to be an important site in the East Asian–Australasian Flyway (Flyway) for migratory shorebirds, and the most important in New South Wales (Weller *et al.* 2020). This has been the case for a long time; for example, Lane (1987) named the estuary as a top-20 site Australia-wide for 14 shorebird species including 12 migratory species, while Smith (1991) nominated it as the most important shorebird site in NSW. However, the estuary also hosts many species of gulls and terns, including several that migrate within the Flyway. The use of the estuary by gulls and terns has not been investigated since the short to medium-term monitoring programs in the 1960s and early 1970s.

Since April 1999, members of the Hunter Bird Observers Club Inc. (HBOC) have undertaken monthly surveys of shorebirds and waterbirds in the estuary. Several reviews have addressed aspects of the estuary's shorebird populations based on these monthly surveys (e.g. Stuart *et al.* 2013; Choi *et al.* 2016; Stuart 2017; Stuart 2019; Jackson *et al.* 2020; Lindsey 2021; Stuart & Lindsey 2021). In this report, we present an analysis of gull and tern populations primarily based on the monthly survey results.

## Prior literature about Hunter River Estuary gulls and terns

Gosper (1981) provided status reports based on his visits during 1970–73. He recorded nine species: Silver Gull *Larus novaehollandiae*, Little Tern *Sternula albifrons*, Australian Gull-billed Tern *Gelochelidon macrotarsa*, Caspian Tern *Hydroprogne caspia*, Whiskered Tern *Chlidonias hybrida*, White-winged

Black Tern *C. leucopterus*, White-fronted Tern *Sterna striata*, Common Tern *S. hirundo* and Greater Crested Tern *Thalasseus bergii*. Little Tern was the only species reported to have any local breeding records – a pair was feeding fledged young at Stockton in January 1973.

The same nine species were recorded by van Gessel and Kendall during their frequent surveys spanning 1969–1977 (Kendall & van Gessel 1972; van Gessel & Kendall 1972a; 1972b; 1974; 2015). Holmes (1970), when reporting his surveys from the late 1960s, also listed the same species, adding two more: Black Tern *C. niger* and Kelp Gull *L. dominicanus*. Black Tern was a vagrant with two records in 1968 (January and March) of what was probably the same bird. Kelp Gull was frequently present (1–2 individuals). At around that time, the Kelp Gull was breeding on Moon Island near Swansea (Gwynne & Gray 1959).

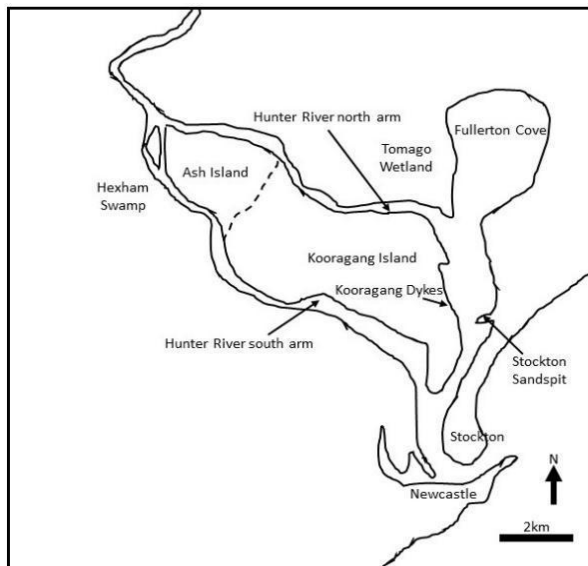
Herbert (2007) summarised the known records for the same nine species as reported by Gosper, with a focus on the data from HBOC's 1999–2007 estuary surveys. His report also included records from non-tidal wetlands in the lower Hunter Valley (e.g. Grahamstown Dam, Woodberry Swamp, Warabrook Wetland). There were no recent breeding records for any of the species.

## METHODS

A detailed description of the survey protocols is available in BirdLife Australia (2021). Species nomenclature follows BirdLife Australia Working List of Australian Birds; Version 4.1 (2022).

Of the 264 scheduled surveys in the Hunter estuary in April 1999 to March 2021, only the June 2007 survey

was not conducted due to severe weather conditions. For 19 other surveys, there were access issues to some monitoring zones: 10 times at the Kooragang Dykes, five at Tomago Wetland and four at Hexham Swamp or some of the Kooragang/Stockton locations (Figure 1). Typically, gull and tern numbers at the latter sites were low, hence we included those nine survey dates in the data analysis. However, as gulls and terns often roosted at the Kooragang Dykes at high tide, we excluded data from the 10 survey dates when the dykes had been inaccessible. Thus, in total we analysed 253 survey dates for the estuary.



**Figure 1.** The Hunter Estuary in NSW (centred at 32° 51' S 151° 46' E) and the main zones that were monitored.

We developed a database for the monthly surveys and used standard MS Excel data analysis tools to identify changes. We selected time intervals for analysis and estimated population sizes by calculating means and standard errors with 95% and 99% confidence intervals. We calculated statistical significance using two-tailed t-tests assuming unequal variance, with  $p < 0.05$  significant and  $p < 0.01$  highly significant.

For seasonal analyses, we defined the seasons for records as: “autumn” (March–May), “winter” (June–August), “spring” (September–November) and “summer” (December–February). To screen assessments of long-term trends, we firstly analysed the combined seasonal results for two 11-year intervals. In case of significant differences we analysed the data for each month.

We reviewed the Hunter Region annual bird report series (e.g. Williams 2020) for records of uncommon and vagrant species. We extracted data about banded or flagged birds from the BirdMark portal (<https://vhost2009.hosted-sites.deakin.edu.au/importing/import.php>) and

obtained supplementary information from Australasian Wader Study Group representatives.

## RESULTS

### Gull and tern species recorded in 1999–2021

Ten gull and tern species were recorded during the 253 monthly surveys (Table 1). Silver Gull was recorded in every survey and Greater Crested Tern in most surveys. Three tern species (Common Gull-billed Tern *Gelochelidon nilotica*, White-winged Black Tern and White-fronted Tern) each had only 1–5 records.

**Table 1.** The number of times gull and tern species were recorded in scheduled monthly surveys in the Hunter Estuary in 1999–2021. Reporting Rates (RR) are calculated by dividing the number of records by the number of surveys expressed as a percentage.

Species	No of records	RR (%)
Silver Gull	253	100
Little Tern	44	17.4
Common Gull-billed Tern	3	1.2
Australian Gull-billed Tern	136	53.8
Caspian Tern	214	84.6
Whiskered Tern	30	11.9
White-winged Black Tern	5	2.0
White-fronted Tern	1	0.4
Common Tern	44	17.4
Greater Crested Tern	232	91.7

Three other species were recorded within or on the outskirts of the estuary during 1999–2021 on non-survey dates: Pacific Gull *Larus pacificus*, Sooty Tern *Onychoprion fuscatus* and Bridled Tern *O. anaethetus*, with several records of the first two species (Table 2).

**Table 2.** Vagrant gull and tern species recorded in the Hunter Estuary in 1999–2021 outside the scheduled monthly surveys.

Species	Details
Pacific Gull	Single individuals in June 2011, Dec 2012, and June 2013.
Sooty Tern	Two individuals in May 2015. 1–2 individuals in Feb 2010, Jan 2012, and Jan 2015. Many individuals in Jan–Feb 2013.
Bridled Tern	A single individual in January 2013.

### Silver Gull

Based on the monthly counts, the Silver Gull population decreased after 2010 in the estuary (Figure 2). For example, there were several records of over 600 individuals in 1999–2010, but none subsequently.

**Table 3.** Mean counts for Silver Gull in the Hunter Estuary for different seasons and comparisons between seasons.

	Summer	Autumn	Winter	Spring	<i>p</i> winter-summer	<i>p</i> spring-summer	<i>p</i> winter-spring
First 11 years	345	430	73	181	< 0.001	< 0.001	< 0.001
Second 11 years	206	223	44	84	< 0.001	< 0.001	0.002
<i>p</i>	< 0.001	< 0.001	0.068	< 0.001			

The decrease was consistent across all seasons and was statistically highly significant for summer, autumn and spring (two-tailed t-tests assuming unequal variance). On average, Silver Gull numbers were much lower in July–September than any other time of the year and the average counts peaked in March–April (Figure 3).

#### *Australian Gull-billed Tern*

When present in the estuary, typically 5–10 individuals of Australian Gull-billed Tern were recorded, but there were occasional influxes of 30 or more individuals (Figure 2). The population has been increasing. Since 2017, high winter counts included 99 individuals in July 2019 and 76 in June 2020.

The recent winter influxes raised the mean winter counts in 2011–2020 to 15 individuals, compared to 1–5 individuals in other seasons. Numbers were higher in June and July than for any other month, but there was considerable variability in the monthly numbers, particularly for March to September, because of the occasional larger influxes (Figure 3).

#### *Caspian Tern*

Caspian Tern was almost always present in the estuary (Figure 2), with seasonal variations, numbers increasing in February–July annually to peak in the autumn (Figure 3). For both 1999–2010 and 2011–2021, the increase in autumn numbers was found to be statistically highly significant when compared to the other seasons (Table 4). The population increase was also highly significant during summer and autumn.

#### *Whiskered Tern*

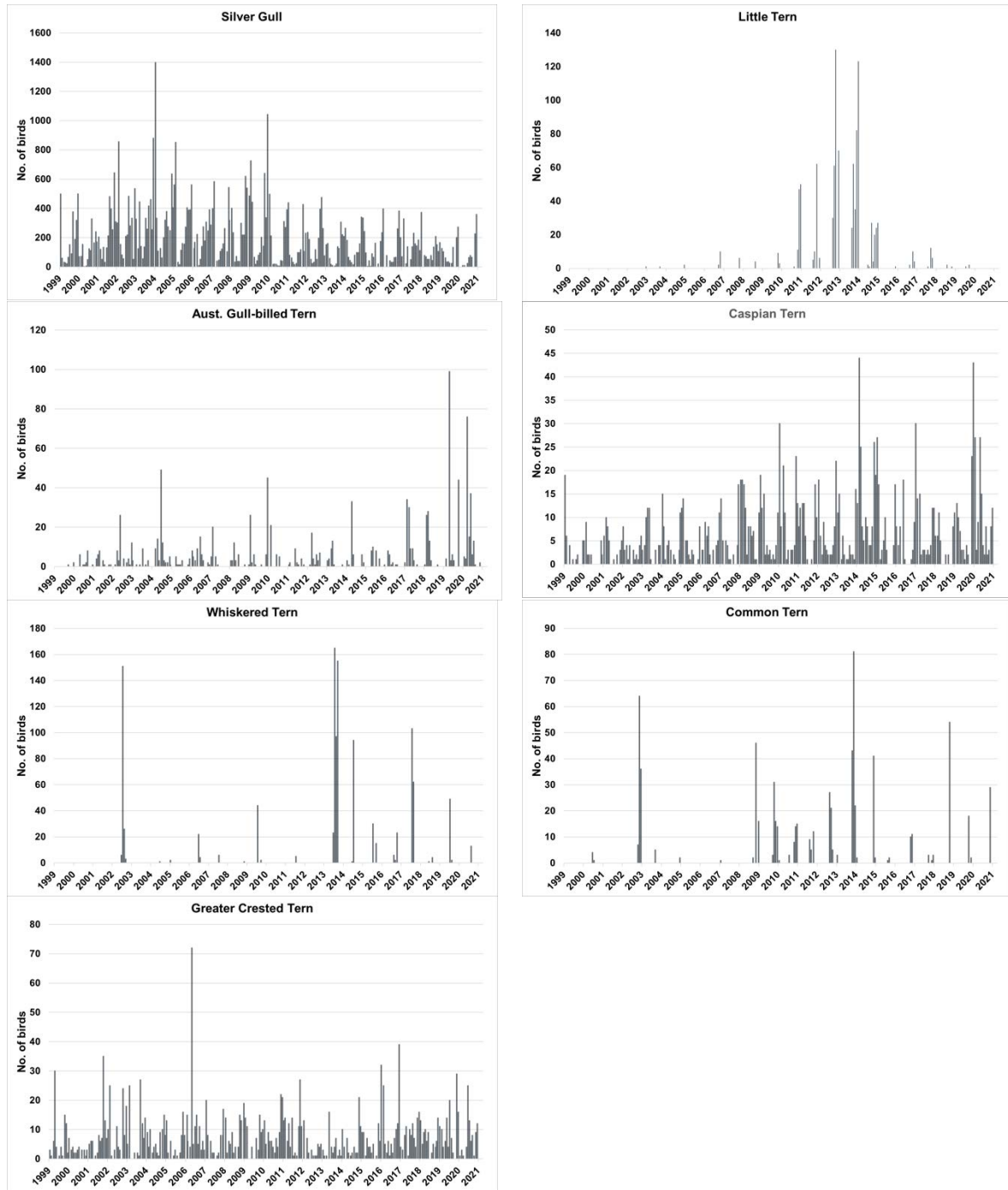
The Whiskered Tern was recorded on 31 surveys with 77% of the records being in the spring. There was one autumn record of two individuals in April 2005 and six summer records spanning five seasons. Although most of the summer records were of 1–3 individuals, 23 were recorded in January 2017 and 155 in December 2013. The latter was during an extended influx; high numbers were present in October–December that year, including 165 individuals in October, which was the highest count for the estuary. There also were 151 individuals present in October 2002, 94 in October 2014 and 103 in October 2017. There were no records in nine years between 1999 and 2011 (Figure 2). The overall numbers since then have increased (means of seven and 12 individuals for spring 1999–2010 and spring 2011–2020, respectively). However, the latter mean was inflated by the 2013 influx of up to 165 birds for three months.

#### *Common Tern*

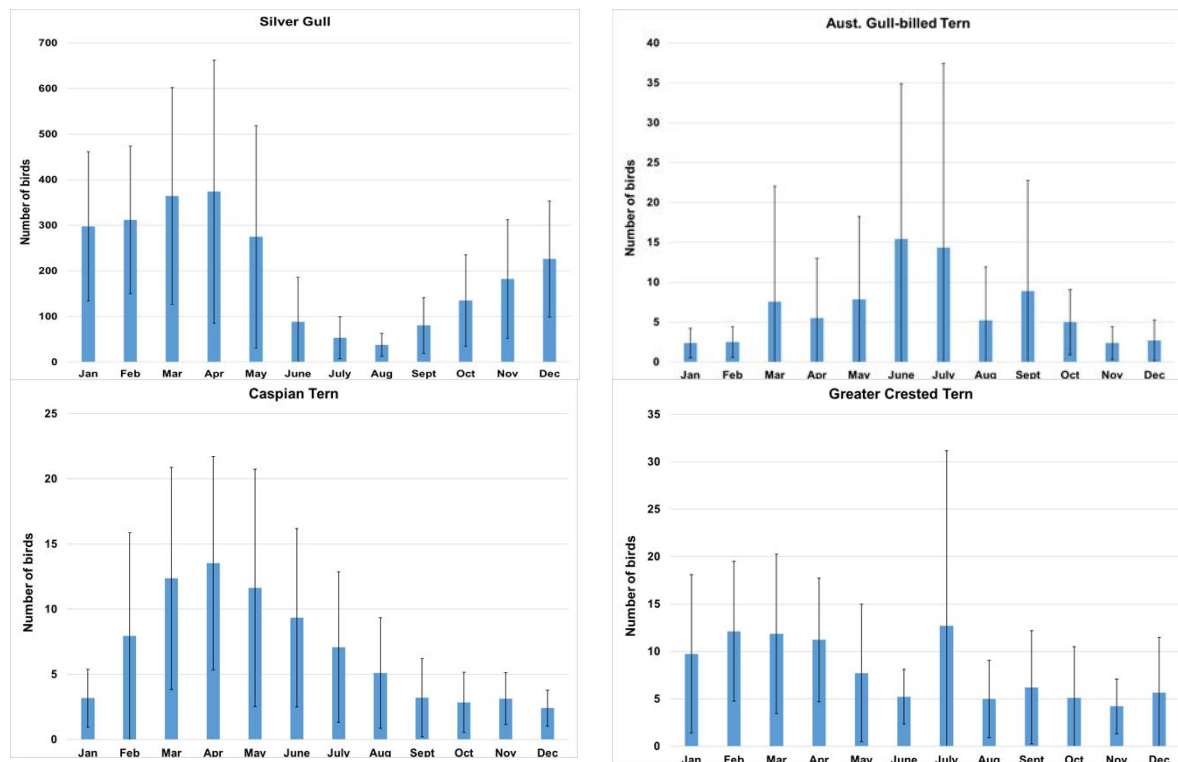
In many years there were few or no Common Tern recorded, but there were several years with 30 or more individuals present with a peak count of 81 in February 2014 (Figure 2). Of the 44 overall records, 12 were in autumn, eight in spring and all the others were in the summer. Seven of the autumn records were in March including five records of 14–36 individuals. The other five autumn records, spanning March–April, were of 1–3 individuals.

**Table 4.** Mean counts for Caspian Tern in the Hunter Estuary for different time intervals and comparisons with counts from other periods using two-tailed t-test.

	Summer	Autumn	Winter	Spring	<i>p</i> autumn-summer	<i>p</i> autumn-winter	<i>p</i> autumn-spring
First 11 years	2	10	6	3	< 0.001	0.005	< 0.001
Second 11 years	6	16	8	3	< 0.001	0.001	< 0.001
<i>p</i>	0.007	0.006	0.168	0.906			



**Figure 2.** Monthly counts for the seven most-frequently recorded gulls and terns in the Hunter Estuary for the period April 1999 to March 2021.



**Figure 3.** Mean monthly counts for selected gull and tern species. The error bars indicate  $\pm 1$  standard deviation.

#### *Little Tern*

Coincidentally, there were also 44 records of Little Tern with few or no records in most years and higher numbers in 2011–2015. There was a peak count of 130 individuals in January 2013 (Figure 2).

Seven of the records were in autumn, 12 in spring and all the others in summer. All of the autumn records were in March, sometimes involving high counts (50 individuals in March 2011, 70 in March 2013 and 123 in March 2014). Seven of the spring records were in November including the only two counts in spring of more than six individuals (30 individuals in November 2012 and 27 in November 2014). Thus, Little Tern were predominantly present in the estuary in November–March.

#### *Greater Crested Tern*

Greater Crested Tern was present in low numbers most months with occasional larger influxes (Figure 2). We did not detect a long-term trend. The highest count of 72 occurred in July 2006 but usually there were more individuals present in summer and autumn with mean counts of 10 and nine individuals, respectively, than in winter or spring with mean counts of six and five birds, respectively (Figure 3).

#### *Infrequent visitors*

There were five records of White-winged Black Tern: a single individual and 13 individuals in February and March 2003, respectively, and 1–2 in February 2012, December 2013 and January 2014. The three records of Common Gull-billed Tern during surveys occurred in summer 2020/21, all of a single bird. However, there were many records presumably of the same individual on non-survey dates. The only record of White-fronted Tern within the estuary was in July 2006 and involved a single roosting bird.

#### **Status summaries and trends**

Over 1999–2021, three species increased in abundance and the abundance of three other species decreased. The remaining five species either had stable populations or showed no conclusive trend (Table 5).

**Table 5.** Status in the Hunter Estuary of gull and tern species recorded in 1999–2021.

Species	Status	Seasonal pattern	Trend
Silver Gull	Regularly present	Autumn peak	Decreasing
Sooty Tern	Vagrant	Summer only	-
Little Tern	Regular visitor	Spring/summer peak	Now stable, after a substantial decrease
Common Gull-billed Tern	Uncertain	-	-
Australian Gull-billed Tern	Frequently present	Winter peak	Probably increasing
Caspian Tern	Frequently present	Autumn peak	Increasing
Whiskered Tern	Passage visitor	Spring peak	Probably increasing
White-winged Black Tern	Rare visitor	Summer	Decreasing
White-fronted Tern	Uncommon visitor	Autumn/winter	-
Common Tern	Regular visitor	Summer peak	Decreasing
Greater Crested Tern	Regularly present	Summer/autumn peak	Stable

## DISCUSSION

The Hunter Estuary surveys are conducted at high tide driven by the objective of shorebird monitoring. This potentially leads to an incomplete picture for other guilds of birds, such as gulls and terns, because their foraging may be less influenced by tides. In particular, Australian Gull-billed, Caspian and Little Tern are often at Stockton sandspit during low tides (authors' pers. obs.) and could be overlooked during high tide surveys.

Based on our data, Silver Gull and Greater Crested Tern use the estuary consistently which is not unexpected for these common and widespread species. Five other tern species (Little, Australian Gull-billed, Caspian, Whiskered and Common Tern) use the estuary intermittently. Little Tern is listed as Endangered in NSW (*Biodiversity Conservation Act 2016*). No species were present in significant numbers relative to their estimated total global or Flyway populations (Wetlands International 2021).

The expansion of available habitat in the estuary as a result of rehabilitation projects aimed at restoring estuarine habitat at Stockton Sandspit, Ash Island, Hexham Swamp and Tomago Wetland (Stuart & Lindsey 2021) may have benefitted Caspian, Australian Gull-billed and Whiskered Terns.

### Silver Gull

The Silver Gull population in NSW rose substantially during the 20<sup>th</sup> century – this increase was linked to an increased availability of food waste from expanding human populations (Smith & Carlile 1993, Smith 1995). It was suggested at the time that the best long-term solution was reduction of food availability in conjunction with a population reduction program, e.g. at waste management centres (Temby 2000).

During the 1970s, Silver Gull had become very common in the Hunter Estuary with 1,000–2000 individuals present at all times (Gosper 1981). The 1999–2021 surveys indicated a decrease, particularly after 2010, possibly linked to changed waste management practices. A modern waste management

centre, Summerhill, was opened in Newcastle in the mid-1990s replacing two older waste centres. Management practices at Summerhill include covering waste during the day as loads are dumped and covering the whole site at night. Although considerable numbers of Silver Gull still forage there (O. Gallagher pers. comm.), the overall food availability has decreased. Inland rainfall patterns may also have affected Silver Gull numbers as fewer gulls visit the Summerhill waste management facility during drought (O. Gallagher pers. comm.).

### Greater Crested Tern

This mainly coastal species, which was present in the estuary throughout the year, is widespread in Australia (Higgins & Davies 1996). Although McLeay *et al.* (2010) reported that Greater Crested Terns did not make large-distance movements, banding studies in NSW in the 1950s found that young and adult birds dispersed north and south from colonies mostly within about 400 km but some up to 1,000 km from their colony (Carrick *et al.* 1957). Similarly, Cooper *et al.* (2016) reported movements of over 2,000 km by young birds.

We detected no long-term trend in Greater Crested Tern numbers in the estuary. The population seems to be stable here, unlike in Western Port in Victoria, where their numbers have decreased probably due to reduced food availability. However, these declines may have been due to a redistribution of feeding areas not to a general decrease (Menkhorst *et al.* 2015). Greater Crested Tern breed on off-shore islands and chicks generally fledge in late December and early January (Higgins & Davies 1996). Adults and fledged young returning from island breeding sites e.g. Broughton Island, approximately 60 km north-east of the estuary, may be responsible for higher numbers in summer and autumn.



### Australian Gull-billed Tern

Australian Gull-billed Tern breeds in inland Australia and is highly dispersive with movement northwards in winter, although at some sites in southern Australia they appear to be more abundant in winter (Higgins & Davies 1996). During the 1970s, this species was present in the estuary all year round but more common in winter (Gosper 1981), similar to our results. Surveys in Port Stephens north of Newcastle (Stuart 2020) and systematic surveys on Worimi Conservation Lands, situated between the estuary and Port Stephens show a similar pattern although numbers at the former site often peak in spring (<https://birddata.birdlife.org.au/>).

### Caspian Tern

Movements of this species in Australia are poorly known and they are considered to be partly resident, dispersive and migratory (Higgins & Davies 1996). In the estuary, surveys indicate that Caspian Tern is more common in autumn and winter than other seasons. In Port Stephens north of Newcastle, it is similarly more common in winter (Stuart 2020).

Banding studies have shown that adults and young move long distances (Higgins & Davies 1996), confirmed by 48 observations of leg-flagged birds in the estuary in the past 22 years. Most of the sightings were from Stockton Sandspit and all birds carried an orange flag from Victoria, over 800 km to the south. Among them were five birds that had been banded as pulli (J. Driessen pers. comm.). The increase in numbers in the autumn may be a consequence of immature birds arriving in the estuary after leaving their natal sites. There is some support for this theory in that two of the five leg-flagged birds were first resighted in autumn in the estuary. The overall increase in population may also be a consequence of the expansion of suitable habitat in the estuary.

### Whiskered Tern

The Australian sub-species *javanicus* is described as mostly migratory; it moves north and north-west to northern Australia, New Guinea, Indonesia and Borneo after breeding mostly in southern Australia (Higgins & Davies 1996). The survey results confirm its status in the estuary as a migratory species (Williams 2020). Whiskered Tern visits the estuary in spring presumably on its migration to breeding grounds in southern Australia. During the 1970s, it was irregular on the swamps of the Hunter River floodplain in winter (Gosper 1981). Although there were no winter records during the 253 scheduled monthly surveys between April 1999 and March 2021, single individuals were seen at Hexham Swamp in June 2020 and June 2021 (B. Watts pers. comm.; AL pers. obs.) and there are some eBird records for Hexham Swamp from earlier years (S. Gorta pers. comm.).

### Common Tern

This migratory species breeds in the northern hemisphere and usually arrives in NSW in late September (Higgins & Davies 1996). Survey data show that the estuary serves both as a staging site in spring and autumn and a non-breeding destination in summer, with the peak numbers occurring in the summer. The highest count was 81 individuals unlike the reports from the 1970s of 500-plus birds each summer (Gosper 1981). Many large counts came from a roost site on Kooragang Island but these ceased after progressive destruction of the site which was complete by 1972 (Maddock 2008).

### Little Tern

The Australian sub-species *sinensis* has three populations (Higgins & Davies 1996; Fraser 2017), two of which could occur in the estuary: the eastern Australian population that breeds as early as September on sandy beaches in spring and summer on the east coast (Higgins & Davies 1996); and the Asian population that breeds in the austral autumn and winter and migrates to Australia in the austral spring and summer (Higgins & Davies 1996). Higher numbers in the estuary in spring and summer may be of migrating individuals and post-breeding individuals. For instance, an adult in breeding plumage that had been flagged in Japan was observed on Stockton Sandspit in October 2011, while in January 2014 adults with two fledged young were observed at Stockton Sandspit (<https://birddata.birdlife.org.au/>). Although there are no records of breeding in the estuary since 1973 (Higgins & Davies 1996), successful breeding events occurred several times on the beach just to the north of the estuary near Fern Bay and on Worimi Conservation Lands along Newcastle Bight between 2009 and 2018 (Stuart 2009–2017, Williams 2019) and in Port Stephens (Fraser 2017, Stuart 2020). The 1973 record should not be treated as a breeding record from within the estuary as the parents were feeding fledged young and thus the natal site may have been elsewhere. Although the population now seems stable, this species has decreased in abundance in the estuary since the 1970s. At that time, it was described as a non-breeding summer visitor and 600-700 birds were recorded in the estuary (Van Gessel & Kendall 1974; Gosper 1981).

### Infrequent visitors

There was only one record of White-fronted Tern within the estuary. This species is a regular winter visitor in low numbers to the Newcastle area; however, individuals prefer to roost around the Newcastle Rock Platform rather than inside the estuary (e.g. Williams 2020) and they forage at sea rather than within the estuary.

White-winged Black Tern numbers have substantially decreased in the estuary, as in the 1970s they were regularly recorded in November–March,

with a maximum count of 81 individuals in March 1977 and many records of 10–20 individuals (van Gessel & Kendall 2015). In February 1995, approximately 300 individuals were present in Fullerton Cove (Stuart 1996). However, since 1999 there have been few records and none during 2018–2021. All records since 2011 have been of 1–3 and usually they were of single individuals.

The first record of a Common Gull-billed Tern in the estuary occurred in late December 2017 (Stuart 2019). Since then, there have been dozens of records, mostly from non-survey dates. Although most of the subsequent records have been in the summer months, there have been three records in May–August (including one from a nearby beach) which suggest that this species now might be a resident around Newcastle.

### Migratory and seasonal movement patterns

Most tern species recorded in the estuary undertake migrations or large-scale movements within the Flyway. The movements of Australian Gull-billed, Caspian and Greater Crested Tern are limited to within Australia, whereas Whiskered, Common, White-fronted, White-winged Black and Common Gull-billed Tern migrate to and from breeding grounds elsewhere in the Flyway (Higgins & Davies 1996, Rogers *et al.* 2005). The non-breeding range of the Little Tern population that breeds in eastern Australia is not completely known (Higgins & Davies 1996). White-fronted Terns breed in New Zealand and in the Furneaux Islands, Whiskered Terns in Indonesia, Borneo and Australia; and the other species breed in the northern hemisphere.

Although Caspian Terns were recorded in most surveys, their numbers peaked in autumn and winter in the estuary, consistent with a northern migration after breeding at southern breeding grounds particularly in Victoria and Tasmania. Also consistent with that post-breeding movement are the observations in the estuary of birds recently banded as pulli in Victoria.

The numbers of Australian Gull-billed Tern in the estuary peaked in winter, mirroring the results from a previous study (Gosper 1981), and numbers from the nearby Port Stephens estuary (Stuart 2020). This seems broadly consistent with the post-breeding dispersal of birds from inland areas. However, the frequent influxes of 30–100+ individuals appear to be linked to a combination of inland and local rainfall patterns. The presence of this species in the estuary might not be associated with a regular migration pattern but instead, might be driven by stochastic events.

Whiskered Tern numbers peaked in spring when birds presumably were migrating to southern breeding grounds. Before 2010, this species was uncommon in the estuary. Since 2010, there have been regular spring records, sometimes of 100 or more individuals, suggesting a more consistent use of the estuary, which appears to be linked to increased foraging opportunities on newly rehabilitated wetlands.

Common Tern was a regular visitor to the estuary in September–March, during the non-breeding season. Although this species breeds in the northern hemisphere, its breeding range is widespread and the natal origin of the individual birds that appear in the estuary is unknown. The only record of a marked bird was of an individual flagged at non-breeding grounds at the Gippsland Lakes in Victoria.

Little Tern was also a regular visitor to the estuary in September–March. The records include four birds that had been marked in Japan (Tokyo Bay), one in China (the Hainan – Guangxi area), and one in north-west Australia.

There were insufficient records of White-fronted Tern or White-winged Black Tern from the estuary to speculate about migration patterns. The former is a regular visitor to the Newcastle area, often in groups of 100–200 individuals, but it rarely uses the estuary, instead preferring to roost at the Newcastle Rock Platform and to forage at sea. They typically arrive at the end of May or early June and remain until early September.

The frequent presence of a single Common Gull-billed Tern since December 2017 is intriguing. This species breeds in Asia and migrates in modest numbers to northern Australia with some immature individuals remaining during the breeding season (Rogers *et al.* 2005).

### CONCLUSION

Regular waterbird surveys 1999 to 2021 confirmed that Silver Gull and Greater Crested Tern were regularly present in the Hunter Estuary and that Australian Gull-billed Tern and Caspian Tern were frequent visitors. Little Tern, Common Tern and Whiskered Tern migrated through the estuary and some individuals stayed over the summer. Three other species, Common Gull-billed, White-winged Tern and White-fronted Tern, were each observed on fewer than five occasions.

None of the gull and tern species bred in the estuary nor had significant numbers recorded relative to their estimated total Flyway populations. Several factors may explain trends and seasonal fluctuations. In the case of Silver Gull, the decrease may be linked to improved waste management practices and to coastal and inland rainfall patterns affecting food availability. The latter may similarly have affected movements of Australian Gull-billed Tern. For Australian Gull-billed Tern, Caspian Tern and Whiskered Tern, the expansion of estuarine habitat through recent rehabilitation projects may have been beneficial.

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