

## Recent high counts of Sharp-tailed Sandpiper in the Hunter Estuary

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At least 1% of the total population of Sharp-tailed Sandpiper *Calidris acuminata* have visited the Hunter Estuary every austral summer since 2011/12. The peak counts have been 7,000-8,000 birds, which is around 9% of the total population. The birds prefer to use newly established salt marsh in areas where tidal inundation has recently been restored.

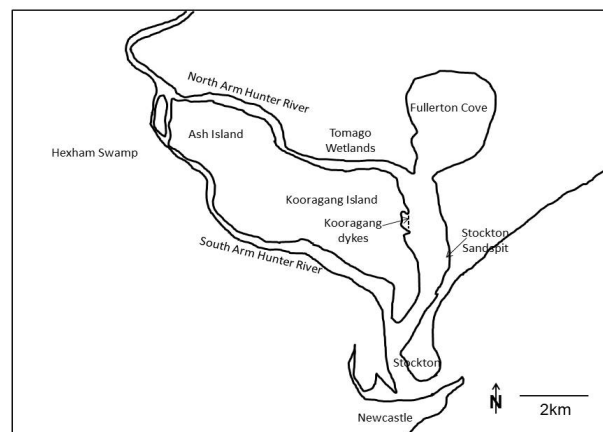
### INTRODUCTION

The Sharp-tailed Sandpiper *Calidris acuminata* lives within the East Asian – Australasian Flyway. Around 90% of the world's population comes to Australia after their breeding season (Bamford *et al.* 2008; Hansen *et al.* 2016). They often use ephemeral wetlands across inland Australia; hence their distribution varies considerably from year to year depending where inland rain has fallen. Bamford *et al.* (2008), using the then-current Sharp-tailed Sandpiper population estimate of 160,000 birds, identified 39 sites in Australia where more than 1% of the population had been recorded. The Hunter Estuary was not on the list although a record of 1,800 birds at Hexham Swamp in 2002 had been overlooked (Stuart 2003). The Sharp-tailed Sandpiper population estimate was revised to 85,000 birds in 2016 (Hansen *et al.* 2016).

Prior to the 2011/12 austral summer, Sharp-tailed Sandpiper were recorded only intermittently in the Hunter Estuary with occasional short duration reports of 1,000 or more birds (Stuart 2016). Since then, there have been large numbers present every summer. **Figure 1** shows the main sites where Sharp-tailed Sandpiper has been recorded in the Hunter Estuary.

In 2016 I documented the known records and demonstrated that the high numbers of Sharp-tailed Sandpiper were associated with newly rehabilitated wetlands at Tomago and Hexham (Stuart 2016). High numbers of Sharp-tailed Sandpiper have continued to visit the Hunter Estuary. This note places on record the 2015/16, 2016/17, 2017/18 and 2018/19 data and presents an overview of what

has happened over eight successive non-breeding seasons since 2011/12.



**Figure 1.** Main locations for Sharp-tailed Sandpiper in the Hunter Estuary

### Shorebird habitat rehabilitation projects in the Hunter Estuary

From the 1950s, for several decades there was considerable loss of shorebird habitat within the Hunter Estuary, mainly to create land for actual or proposed industrial developments (Herbert 2007). However, more recently there have been several rehabilitation projects, including:

- Re-opening of creeks on Ash Island to tidal flushing, and at around the same time the re-engineering of Stockton Sandspit to encourage tidal coverage of the area (Streever 1998; Svoboda 2017).
- Installation of smart gates at Tomago Wetlands in 2008 to allow tidal flushing (Lindsey 2012). Tidal flushing did not occur regularly until 2012 for various operational reasons, and was

again disrupted from October 2018 for several months (J. Erskine pers. comm.).

- Re-opening of the floodgates at Hexham Swamp. One floodgate opened in December 2009 but progress with the others was slow and it was not until July 2013 that all eight gates had been re-opened (Hunter Local Land Services 2015).

## METHODS

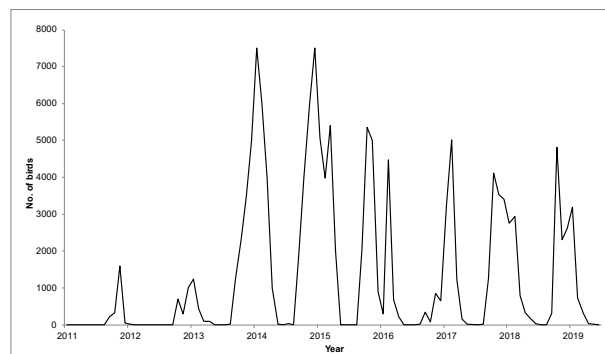
I extracted records from various sources. The main source was the monthly surveys of the Hunter Estuary done by members of Hunter Bird Observers Club (HBOC). Those surveys use a standard procedure involving multiple teams who visit all the known high tide shorebird roost sites (Stuart *et al.* 2013). Additional records were sourced from the Hunter Region Annual Bird Reports (e.g. Stuart 2018) and from the Birddata portal ([www.birddata.birdlife.org.au](http://www.birddata.birdlife.org.au)). For my analysis I used the highest daily total count of Sharp-tailed Sandpiper on record for each month. Usually this was the count obtained from the systematic surveys by HBOC members. However, sometimes higher peak counts were obtained by other observers who, for example, saw a large flock in flight. There are considerable practical difficulties in counting Sharp-tailed Sandpiper accurately as they often are widely dispersed when foraging or roosting and the entire flock is rarely on view simultaneously.

Data for Australian inland rainfall in 2014-2016 were sourced from the CHIRPS (Climate Hazards Group InfraRed Precipitation with Station data) dataset (Funk *et al.* 2014; Stuart 2017). Data for 2018 inland rainfall was obtained from the Bureau of Meteorology website (Bureau of Meteorology 2019).

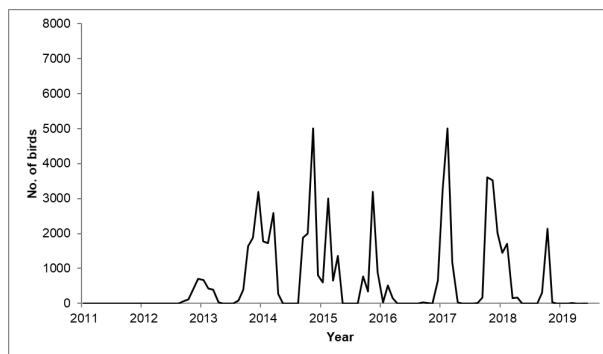
## RESULTS

**Figure 2** shows the monthly numbers of Sharp-tailed Sandpiper recorded in the Hunter Estuary between January 2011 and June 2019. There had been very few birds in the estuary in the 2010/11 non-breeding season (the maximum count was 40 birds, in December 2010). The period graphed spans eight non-breeding seasons. In the 2013/14 and 2014/15 seasons, there were many estimates of flock sizes of 7,000-8,000 birds in flight (these included some counts made from photographs). These are plotted as 7,500 birds in **Figure 2** and are the greatest counts on record for the estuary. However, more than 1,000 Sharp-tailed Sandpiper were present for at least some part of each of the eight non-breeding seasons. Since the 2013/2014 season, the maximum counts have been of more than 4,000 birds every austral summer.

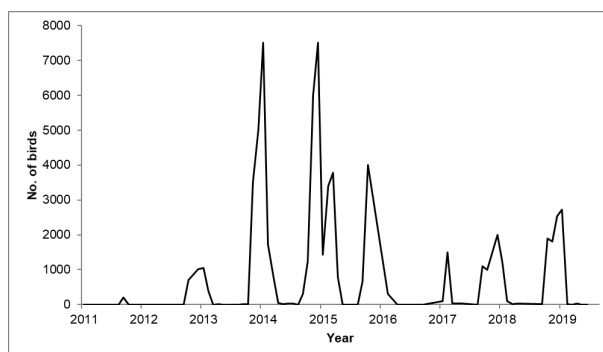
The Sharp-tailed Sandpiper was recorded at many sites within the Hunter Estuary but there were four main locations – Ash Island, Stockton Sandspit, Tomago Wetlands and Hexham Swamp. The latter two were the most important of the locations, often hosting more than 1,000 Sharp-tailed Sandpiper. **Figures 3** and **4** show the monthly highest records at Tomago and Hexham.



**Figure 2.** Monthly maximum records for Sharp-tailed Sandpiper in the Hunter Estuary for the period January 2011 to June 2019.



**Figure 3.** Monthly maximum records for Sharp-tailed Sandpiper at Tomago Wetlands for the period January 2011 to June 2019.



**Figure 4.** Monthly maximum records for Sharp-tailed Sandpiper at Hexham Swamp for the period January 2011 to June 2019.

## DISCUSSION

### International significance

Sites that host more than 1% of the population of a shorebird species are considered internationally significant (Department of the Environment, Water, Heritage and Arts 2009; Clemens *et al.* 2010). The estimated world population of Sharp-tailed Sandpiper is 85,000 birds (Hansen *et al.* 2016). Hence, the threshold for international significance is records of 850 or more Sharp-tailed Sandpiper. This threshold count of birds has occurred in the Hunter Estuary every austral summer from 2011/12 to 2018/19. More than 5% of the world population was present every summer from 2013/14 onwards. The peak counts of 7,000-8,000 birds in 2013/14 and 2014/15 were around 9% of the world population.

The importance currently of the Hunter Estuary for Sharp-tailed Sandpiper is very clear. The estuary has hosted internationally significant numbers of them for eight non-breeding seasons in succession since 2011/12. Only ten other sites in Australia have ever hosted more Sharp-tailed Sandpiper than the Hunter Estuary's peak counts of 7,000-8,000 birds (Bamford *et al.* 2008; Shorebirds 2020 database 2019). Those sites are: Lake Cawndilla NSW (37,522 birds February 1996); The Coorong, SA (33,740 birds January 2006, also 17,067 birds February 2002); Eighty Mile Beach, WA (25,000 birds date unknown); Port Hedland Saltworks WA (20,000 birds, date unknown); Tullakool Evaporation Ponds, NSW (10,000 birds, date unknown); Lake Gregory, WA (10,000 birds, date unknown); Lake Buloke, Vic. (12,000 birds, February 1984); Lake Hawdon, SA (16,430 birds January 2019, also 7,860 birds January 2010); Goolwa Barrage, SA (14,222 birds January 2012, also 11,542 birds January 2010) and Penrice SA (9,800 birds, December 1980).

BirdLife Australia's Shorebirds 2020 database has many thousands of records for Sharp-tailed Sandpiper in Australia, including the location and date and the numbers of birds present (D. Weller pers. comm.). Inspection of Shorebirds 2020 records revealed that, outside of the Hunter Estuary, there have been fewer than 20 locations where there have been 850 or more birds present (i.e. 1% or more of the Sharp-tailed Sandpiper total world population) in more than one year. The main sites elsewhere in Australia for >850 birds have been:

### Victoria

- Avalon Saltworks (2006-2008)
- Western Treatment Plant (2012-2018)
- Eastern Treatment Plant (2012-2018)
- Lake Connemara (2007-2010)
- Moolap Saltworks / Reedy Lake (2007-2009)
- Edithvale (2006-2015, some years)
- Hospital Swamp (2006, 2009)
- Lake Linlithgow (2007-2008)

### South Australia

- Coorong/Goolwa area (2006-2008)
- Cheetham Saltworks (2008, 2010)
- Morella basin (2006, 2018-2019)
- Lake Hawdon (2009-2010, 2017-2018)

### Queensland

- Cape Bowling Green (2011, 2013)
- Bishop Island (2005-2009)
- Ross River (2005-2006)

### New South Wales

- Fivebough Swamp (2013, 2015)

### Western Australia

- Lake McLarty (2005-2013, some years)
- Peel Inlet (2006, 2009-2010)

### Temporary departures from the Hunter Estuary

In some seasons the numbers of Sharp-tailed Sandpiper varied considerably, with a thousand or more birds sometimes disappearing for a period of time (**Figure 2**). The three most notable examples occurred in the 2015/16, 2016/17 and 2018/19 seasons. Those apparently temporary departures of 1,000-2,000 birds may be associated with difficulties in locating and accurately counting Sharp-tailed Sandpiper when they are dispersed in salt marsh habitat. That is, their numbers may have been under-estimated. However, all three instances corresponded with heavy rainfall events occurring inland. I have previously shown a strong relationship between inland rainfall and the numbers of Red-necked Avocet *Recurvirostra novaehollandiae* present in the Hunter Estuary

(Stuart 2017). The Sharp-tailed Sandpiper in the Hunter Estuary probably exhibits the same behaviour, based on examination of the three main instances of reduced numbers.

In February 2015, 3,974 birds were recorded in the Hunter Estuary with estimates in the two adjacent months of 5,000-5,500 birds. That decline of 1,000-1,500 birds corresponds with heavy inland rainfall occurring in the period December 2014 to January 2015 (see Table 1 in Stuart 2017). In October and November 2015, 5,000-5,500 birds were again in the estuary, declining to *c* 900 Sharp-tailed Sandpiper in December 2015 and *c* 300 birds in January 2016. The numbers rose again in February 2016 to a peak count of 4,467 birds late in the month. The 2-3 month absence of Sharp-tailed Sandpiper again corresponded to heavy inland rainfall, which commenced in November 2015 (Stuart 2017). Almost twice as much rain fell inland compared to the December 2014 - January 2015 period, perhaps explaining why almost all the Sharp-tailed Sandpiper departed the Hunter Estuary.

Substantial inland rain fell in South Australia and south-eastern parts of Western Australia over October to December 2018, with large parts of that area recording the highest rainfall on record (Bureau of Meteorology 2019). The numbers of Sharp-tailed Sandpiper in the Hunter Estuary dropped from *c* 4,800 birds present in October 2018 to 2,300-2,600 birds in November and December.

### Tomago Wetlands and Hexham Swamp

In every austral summer since Tomago Wetlands and Hexham Swamp began to be significantly affected by tidal flushing, they have each regularly hosted more than 1% of the total population of Sharp-tailed Sandpiper. Often there has been more than 5% of the population present.

A new smart gate system was installed at Tomago Wetlands in 2008 but tidal flushing only occurred intermittently for the next few years because of operational issues followed by a period of heavy rain, and shorebirds were only occasionally recorded (Lindsey 2012). Shorebirds began to visit Tomago Wetlands regularly from September 2012, including increasing numbers of Sharp-tailed Sandpiper which peaked at ~700 birds in December that season. In every subsequent austral summer, more than 2,000 have been present regularly and the peak counts were of ~5,000 birds (**Figure 3**).

The importance of the tidal flushing regime at Tomago Wetlands was clearly demonstrated in 2018/2019. Birds began arriving there in September 2018 and rose to a peak count of 2,132 birds in October (**Figure 3**). However, from late October 2018 the tidal gates were closed because of operability issues (J. Erskine pers. comm.). Sharp-tailed Sandpiper numbers plunged to zero within two weeks of the closure of the gates. Although one of the tidal gates was re-opened in late 2018, the resultant water flows into Tomago Wetlands were minimal and the Sharp-tailed Sandpiper did not ever return to the site in the 2018/2019 season.

The first of eight floodgates at Hexham Swamp was re-opened in December 2009 but progress in opening the others was slow and it was not until July 2013 that all eight gates had been re-opened (Hunter Local Land Services 2015). In October 2012, 700 Sharp-tailed Sandpiper arrived and the peak count for them at Hexham Swamp that summer was 1,057 birds in January 2013. Since then, more than 1,000 birds have been recorded every summer and the peak counts were of 7,000-8,000 birds in 2013/14 and 2014/15 (**Figure 4**).

### Salt marsh in transition

Sharp-tailed Sandpiper have foraged and roosted in large numbers each summer in the considerable tracts of salt marsh that formed at Hexham Swamp and Tomago Wetlands after each site became tidally influenced. There also are areas of salt marsh at Ash Island and Stockton Sandspit but Sharp-tailed Sandpiper have used those areas less frequently and/or birds were present in lesser numbers.

There are some records since 2013 of up to 1,000 birds at Stockton Sandspit but primarily these were of birds which were roosting not foraging.

Ash Island has large areas of salt marsh, most of which was formed after tidal flushing was progressively restored there in the early 2000s (AS pers. obs.). The highest counts for Ash Island occurred in 2002-2011 after tidal flushing had recommenced and salt marsh had newly established. The maximum count was 1,600 birds in November 2011 (see **Figure 2**). It is noteworthy that in the period since 2012/13 of regular Sharp-tailed Sandpiper visits to the Hunter Estuary, the birds have shown a decided preference for newly established salt marsh at Hexham and Tomago rather than the longer-established salt marsh

occurring on Ash Island. The peak count of Sharp-tailed Sandpiper on Ash Island since 2013 was 514 birds in October 2018. In the other periods when several thousand birds have been in the Hunter Estuary, the highest counts of them from Ash Island have been of fewer than 100 birds.

The importance of salt marsh in transition might also explain the much greater counts for Sharp-tailed Sandpiper at Hexham Swamp and Tomago Wetlands in the 2014/15 and 2015/16 seasons. However, other explanations may also be possible.

The pattern of visits suggests that foraging opportunities for Sharp-tailed Sandpiper are better when the saltmarsh is first establishing. There seem to have been no studies of what the birds are eating in the new salt marsh habitat and how saltmarsh food productivity changes as the saltmarsh becomes established.

## CONCLUSIONS

Since 2011/12, the Hunter Estuary has become a regular site for large numbers of Sharp-tailed Sandpiper. This contrasts with the sporadic nature of records of large numbers of them from elsewhere in Australia. More than 1% of the total world population has been present for at least some part of each austral summer for eight years in a row and often more than 5% of the total. Peak counts have been 7,000-8,000 birds, which is around 9% of the world population. Following brief periods of heavy inland rain, many Sharp-tailed Sandpiper temporarily depart the Hunter Estuary.

The birds prefer to use newly established salt marsh in areas where tidal inundation has recently been restored. A study seems warranted, to understand how saltmarsh food productivity changes as the saltmarsh becomes established.

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## REFERENCES

- Bamford, M., Watkins, D., Bancroft, W., G. Tischler, G. and Wahl, J. (2008). 'Migratory Shorebirds of the East Asian – Australasian Flyway: Population Estimates and Internationally Important Sites'. (Wetlands International – Oceania. Canberra, Australia.)
- Bureau of Meteorology (2019). Monthly rainfall totals for Australia. <http://www.bom.gov.au> (accessed 17 February 2019).
- Clemens, R.S., Weston, M.A., Haslem, A., Silcocks, A. and Ferris, J. (2010). Identification of significant shorebird areas: thresholds and criteria. *Diversity Distrib.* **16**: 229-242.
- Department of the Environment, Water, Heritage and Arts (2009). EPBC Act Policy Statement 3.21 – Significant Impact Guidelines for 36 Migratory Shorebird Species. (Department of the Environment, Water, Heritage and the Arts, Australian Government: Canberra.)
- Funk, C.C., Peterson, P.J., Landsfeld, M.F., Pedreros, D.H., Verdin, J.P., Rowland, J.D., Romero, B.E., Husak, G.J., Michaelsen, J.C. and Verdin, A.P. (2014). A quasi-global precipitation time series for drought monitoring: U.S. Geological Survey Data Series 832, 4 pp., <http://dx.doi.org/10.3133/ds832>. Data to March 2017 downloaded from the CHIRPS (Climate Hazards Group InfraRed Precipitation) satellite sensed rainfall dataset: <https://explorer.earthengine.google.com/#detail/UCS-B-CHG%2FCHIRPS%2FPENTAD>
- Hansen, B.D., Fuller, R.A., Watkins, D., Rogers, D.I., Clemens, R.S., Newman, M., Woehler, E. and Weller, D.R. (2016). Revision of the East Asian – Australasian Flyway population estimates for 37 listed migratory shorebird species. (Unpublished report for the Department of the Environment. BirdLife Australia, Melbourne.)
- Herbert, C. (2007). Distribution, abundance and status of birds in the Hunter Estuary. Hunter Bird Observers Club Special Report No. 4. (Hunter Bird Observers Club Inc.: New Lambton, NSW.)
- Hunter Local Land Services (2015). Report of the Lower Hunter Community Advisory Group. [www.hunterlls.nsw.gov.au](http://www.hunterlls.nsw.gov.au). Accessed 19 October 2015.
- Lindsey, A. (2012). Birds of Tomago Wetlands, Hunter Wetlands National Park 2007-2012. *The Whistler* **6**: 1-10.
- Shorebirds 2020 database (2019). BirdLife Australia, Melbourne, Victoria. Data extracted by D. Weller 20 February 2019.
- Streever, W.J. (1998). Kooragang Wetland Rehabilitation Project: opportunities and constraints in an urban wetland rehabilitation project. *Urban Ecosystems* **2**: 205-218.
- Stuart, A. (Ed.). (2003). Hunter Region of New South Wales Annual Bird Report Number **10** (2002). (Hunter Bird Observers Club Inc.: New Lambton, NSW.)

- Stuart, A. (2016). Records of Sharp-tailed Sandpiper *Calidris acuminata* in the Hunter Estuary, New South Wales. *Stilt* **68**: 18-21.
- Stuart, A. (2017). Red-necked Avocet *Recurvirostra novaehollandiae* in the Hunter Estuary of New South Wales. *Stilt* **71**: 3-8.
- Stuart, A. (Ed.). (2018). Hunter Region of New South Wales Annual Bird Report Number **25** (2017). (Hunter Bird Observers Club Inc.: New Lambton, NSW.)
- Stuart, A., Herbert, C., Crawford, L., Lindsey, A., Roderick, M., McNaughton, N., Powers, J. and Huxtable, L. (2013). Hunter Estuary Population Counts 1999-2010. *Stilt* **63-64**: 46-49.
- Svoboda, P. (2017). Kooragang Wetlands: Retrospective of an integrated ecological restoration project in the Hunter River Estuary. (28<sup>th</sup> NSW Coastal Conference, Terrigal NSW.)