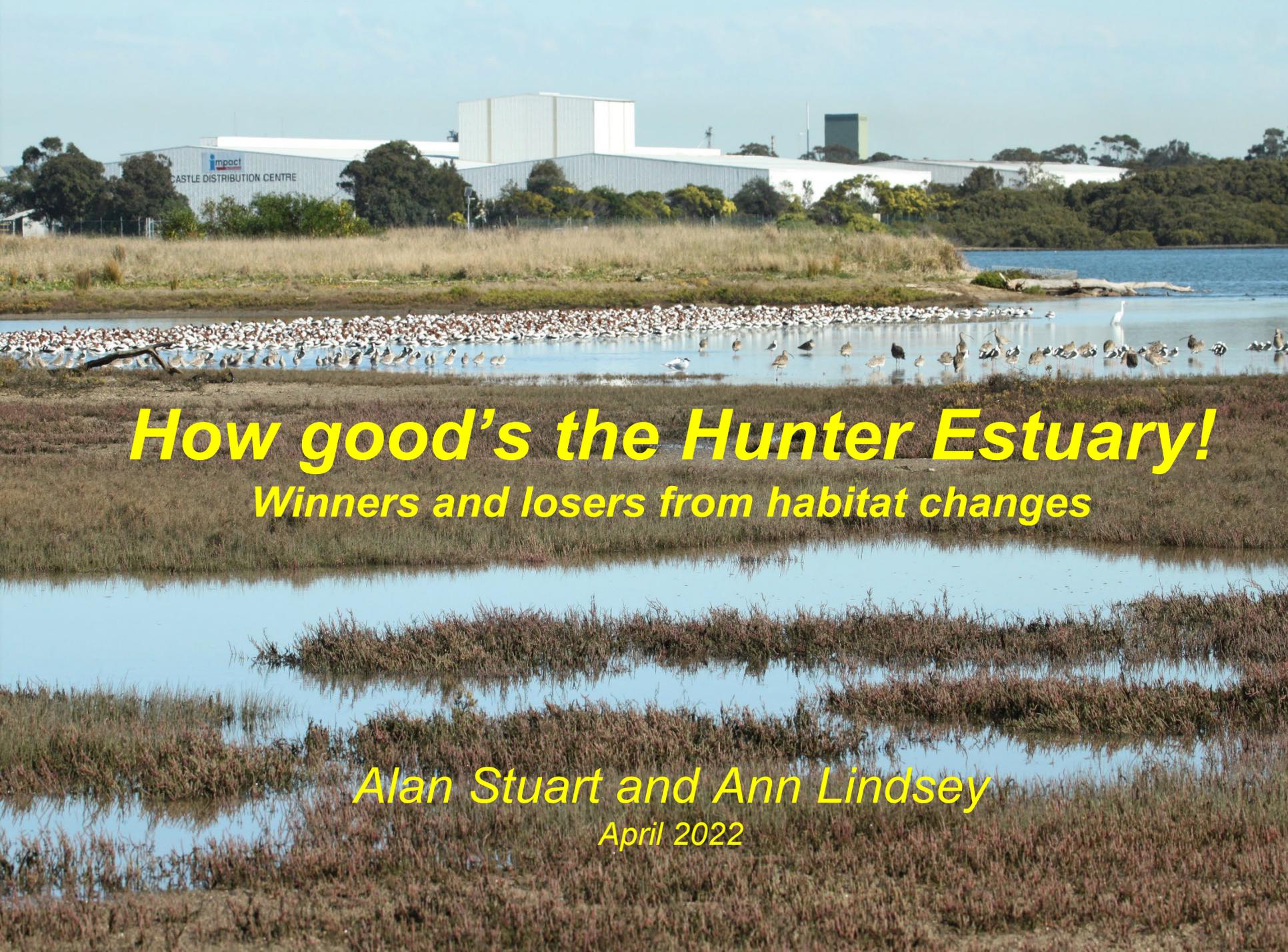


It's time to celebrate!



April 2022: HBOC members completed 23 years of monthly surveys of the Hunter Estuary



How good's the Hunter Estuary!

Winners and losers from habitat changes

Alan Stuart and Ann Lindsey
April 2022

Hunter estuary

- History of intermittent survey effort from 1960s to 1990s
- Monthly surveys by HBOC members since April 1999
 - Started with 4 people (Liz, Chris, Ann, Alan)
 - Since then, more than 200 people have helped with at least one survey
- All shorebirds and waterbirds monitored
 - 98 species recorded in 23 years
- Focussed on shorebird roost sites
 - Surveys done at high tide
 - Teams simultaneously visit all sites that are known to host shorebirds
- Insights into:
 - Seasonal variations
 - Longer-term trends
 - Effects of changes in habitat



The team at the 2006 anniversary (photo by??)

A brief history – some negatives

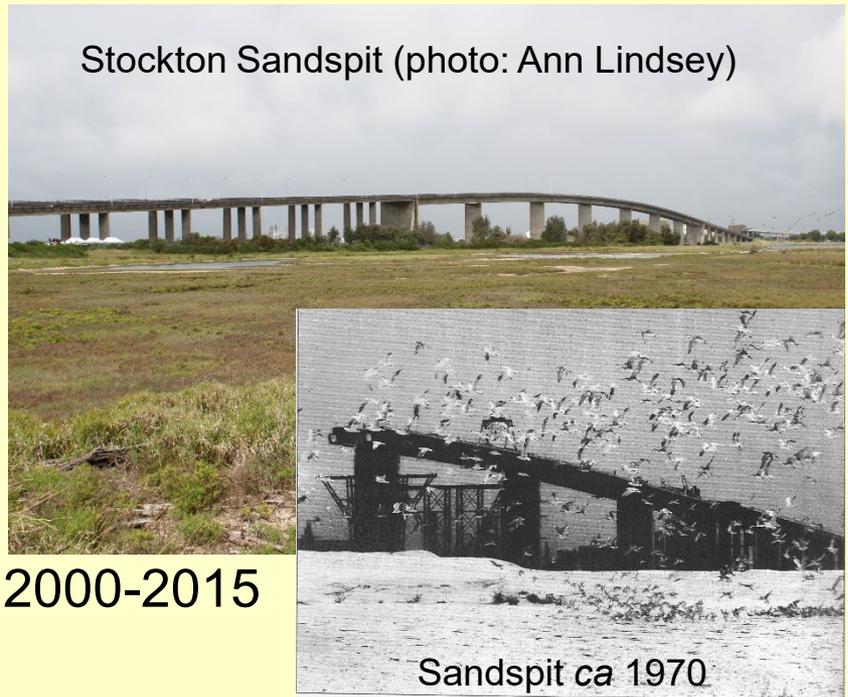
- Major losses of tidal wetland and shoreline habitat throughout the 20th Century
 - Dredging & amalgamation of islands (improved passage for shipping)
 - Industrial development (factories, coal-handling facilities)
 - Agriculture (esp. beef & dairy)
 - Floodgates (flood mitigation schemes, mosquito control)
- Multi-decade contamination of Fullerton Cove mudflats by firefighting chemicals from Williamtown Airport
- Closure of Stockton Sewage Works (a roost site)
- Oil spill in 2010 (impacts are uncertain)
- Key area of Ash Island is reserved for an infrastructure corridor

Aerial view of Newcastle harbour (photo by???)



A brief history – some positives

- Creation of Stockton Sandspit (from dredge spoil for bridge)
- Creation of the Kooragang Dykes roost site
 - Original intention: to build factories behind it
- Restoration of tidal flushing regimes at Ash Island, Hexham Swamp and Tomago Wetland in 2000-2015 (→ 1500+ ha of tidal wetlands)
- Conservation values formally recognised (Kooragang NR, since expanded as the Hunter Wetlands NP)
- Acceptance by NSW regulators of the value of targeted mangrove control measures



In this presentation

- Trends for endemic and migratory shorebirds
- Why are the numbers of some migratory shorebirds plummeting?
- The decline in Silver Gulls
- Trends for tern species
- The Black-necked Stork success story
- Trends for waterbirds
- The benefits for birds from local wetland rehabilitation projects

Far Eastern Curlew

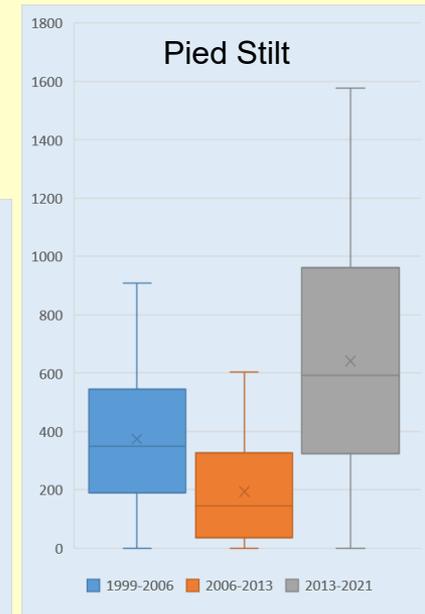
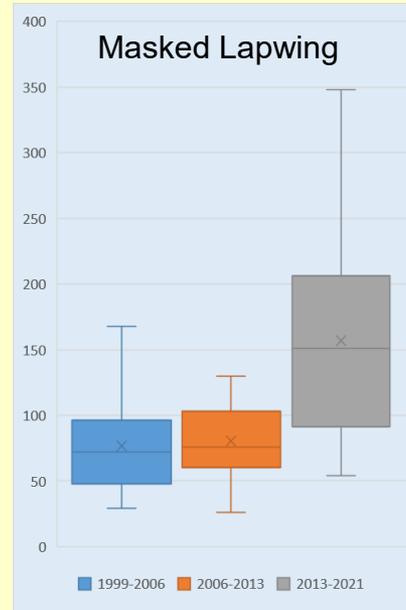


Pair of Black-necked Storks



Endemic shorebirds

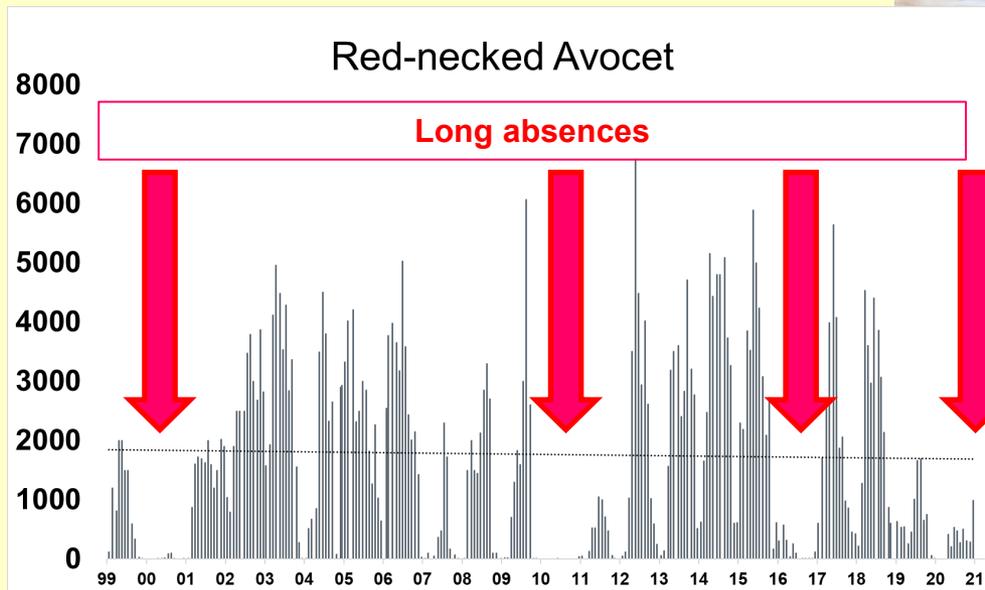
- Numbers generally stable or rising
- Major winners have been Pied Stilt and Masked Lapwing
- Increases in winter for Black-fronted and Red-kneed Dotterel
 - Variable numbers because of link with inland rainfall patterns



Graphs show the spread of monthly counts for three consecutive time periods

Red-necked Avocets

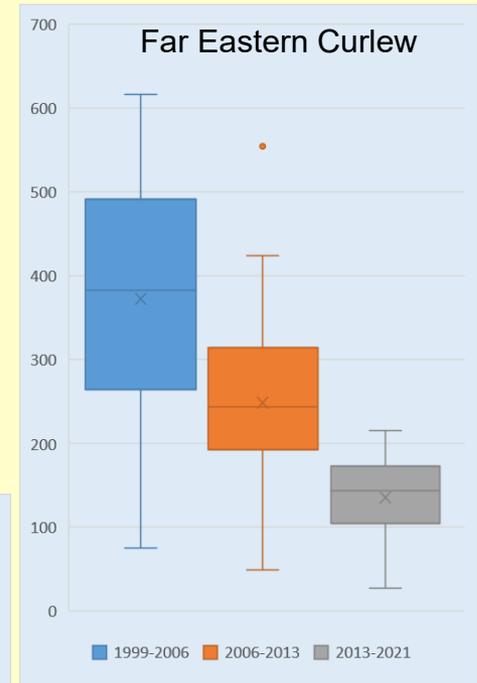
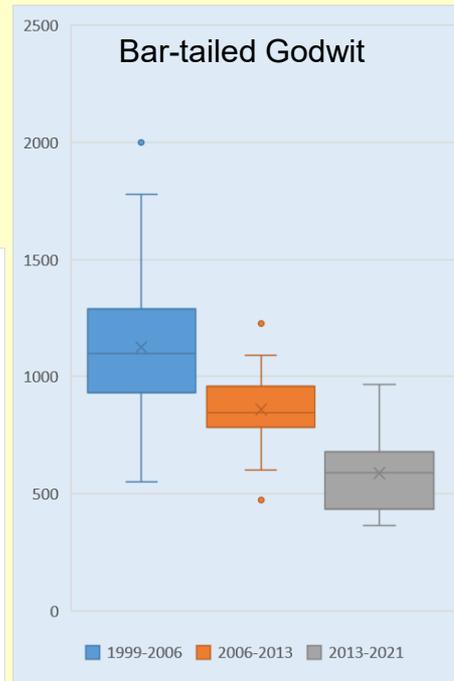
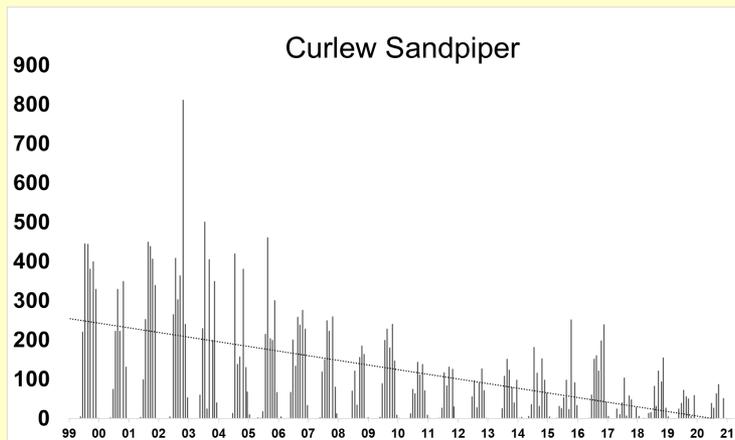
- Up to 5% of total population often present
 - Sometimes 7-8% are present
- Numbers fluctuate dramatically in response to inland rainfall patterns
 - Several long absences since 1999



Requires ~3 months of above-average inland rain for Avocets to depart the estuary

Migratory shorebirds

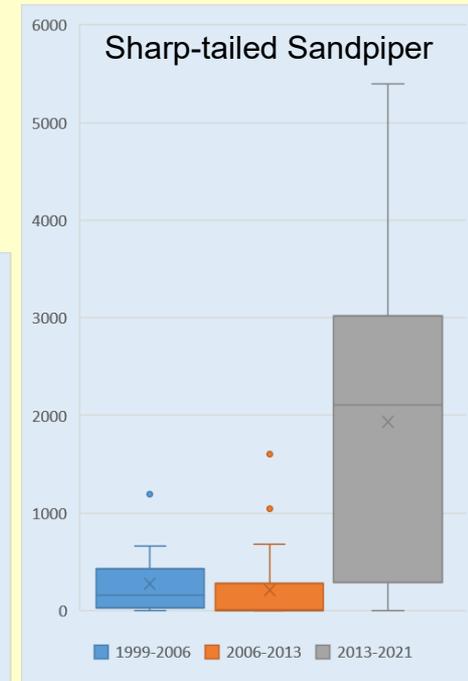
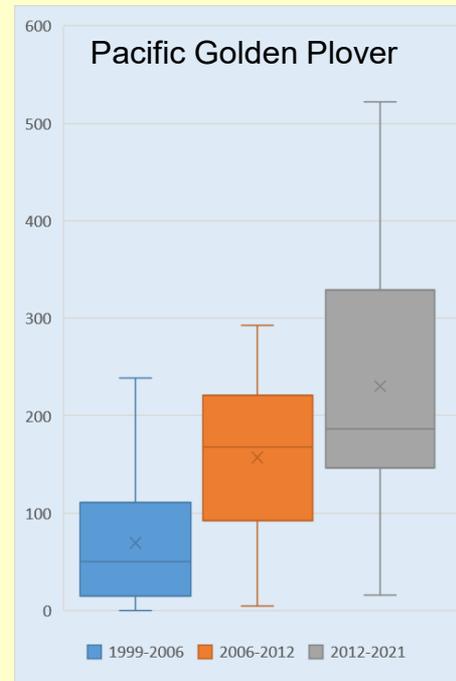
- Massive declines for most migratory shorebirds
 - Exceeding the national trend – the Hunter estuary has greatest decline of all Australian sites (Clemens *et al.* 2016)
 - Continuation of trends dating from the late 1980s
- Three exceptions
 - Sharp-tailed Sandpiper
 - Pacific Golden Plover
 - Grey-tailed Tattler (low base)



Graphs show the spread of summer counts for three consecutive time periods

Migratory shorebird winners

- Sharp-tailed Sandpiper, Pacific Golden Plover and Grey-tailed Tattler
 - Tattler increases are modest
 - STSP counts 2013-2019 were 1,000+ birds each year (peak was c 8% of total population)
 - STSP numbers since 2019 have been much lower
 - Pacific Golden Plovers almost recovered to 1980s levels (still stable??)



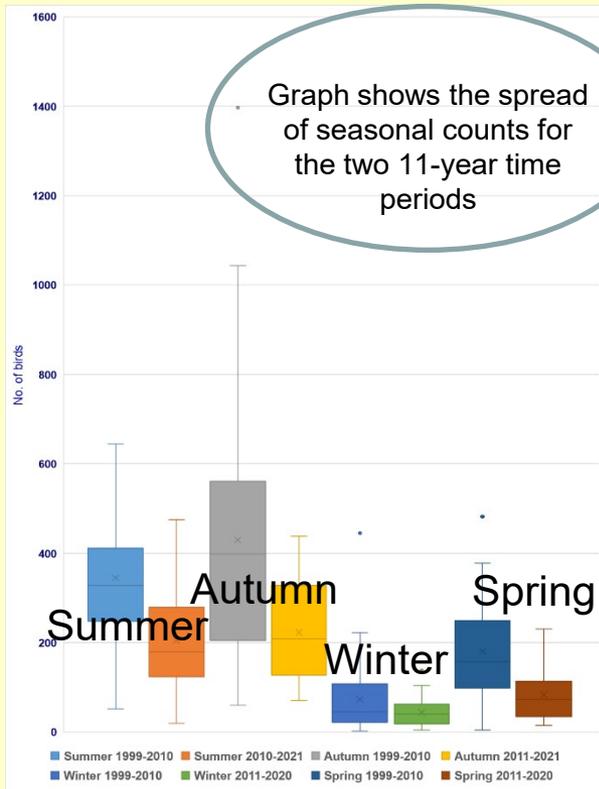
Graphs show the spread of summer counts for three consecutive time periods

Why are some shorebird numbers increasing and others decreasing?

- All shorebird species in decline have three features in common:
 - Migratory
 - The majority of their population stages in the Yellow Sea to feed
 - In the Hunter Estuary they forage mainly in Fullerton Cove
- The three migratory species not in decline mainly don't forage in Fullerton Cove. Nor do the endemic shorebirds.
- The newly-restored wetlands have benefitted many generalist species
- Has the contamination of Fullerton Cove affected the food supply?
 - PFOS/PFAS chemicals have been confirmed to be present
 - At levels below acute toxicity for benthic organisms
 - Chronic (= long-term) effects have not been investigated
 - Hunter Estuary has the greatest declines in migratory shorebirds, for all monitored sites in Australia

Silver Gull

- Numbers are highest in summer & autumn
- Statistically highly significant declines post-2010
 - Linked to changed practices at Summerhill waste management centre



Terns

- Increasing populations
 - Aust. Gull-billed Tern, Caspian Tern, Whiskered Tern
- Decreasing populations
 - White-winged Black Tern, Common Tern
- Stable populations
 - Greater Crested Tern, Little Tern
(longer-term declines currently are arrested)
- Decreases probably stem from Flyway changes
- Increases appear to stem from local wetland rehabilitation projects
- Little Terns probably have benefitted from improved conservation practices on Newcastle Bight (Worimi Conservation Lands)



Little Tern



Aust. Gull-billed Tern

Ducks and other small waterbirds

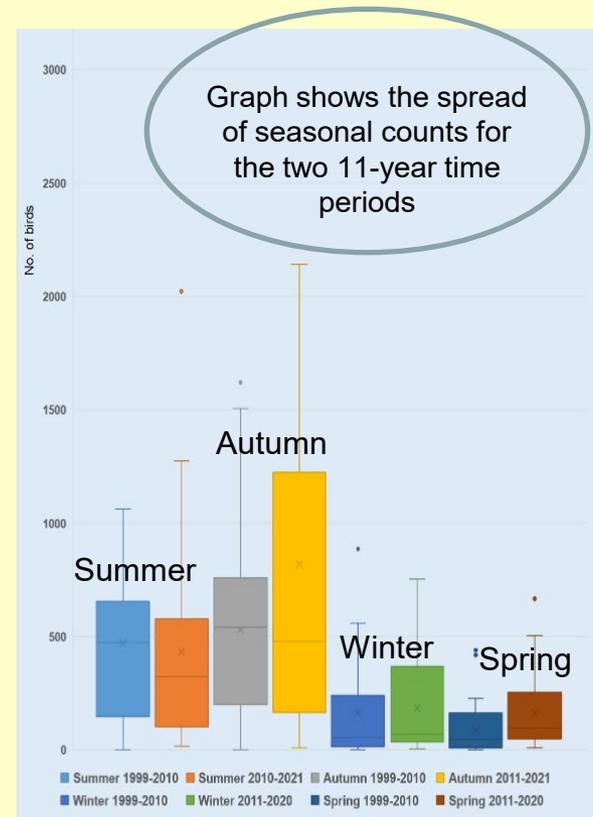
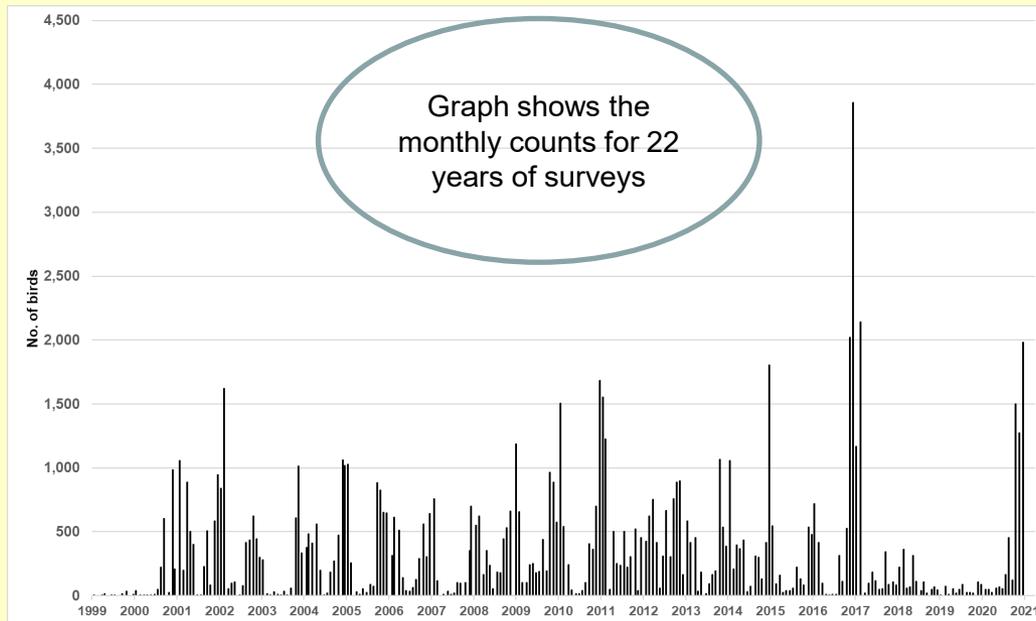
- Increasing populations (statistically significant changes)
 - Black Swan, Australian Wood Duck, Pacific Black Duck, Grey Teal, Chestnut Teal, Australasian Grebe, Purple Swamphen, Eurasian Coot
 - For some of the above species, the population changes have had strong seasonal aspects
- Decreasing populations – nil
 - However, some species have had fluctuating populations eg Pink-eared Duck, Hardhead, Australasian Shoveler, Hoary-headed Grebe
- Intermittent records of crakes
 - Baillon's, Spotless, Australian Spotted
 - Linked with conditions inland
- *Several freshwater wetlands in the lower Hunter which support waterbirds are NOT monitored in the monthly estuary surveys*



Pink-eared Ducks

Chestnut Teal

- >1% of total population (1,000 birds) has often been present
- The peak count in March 2017 was 3.8% of the total population
- The greatest numbers occur in autumn. The increase in autumn in the second 11-year period is statistically significant.



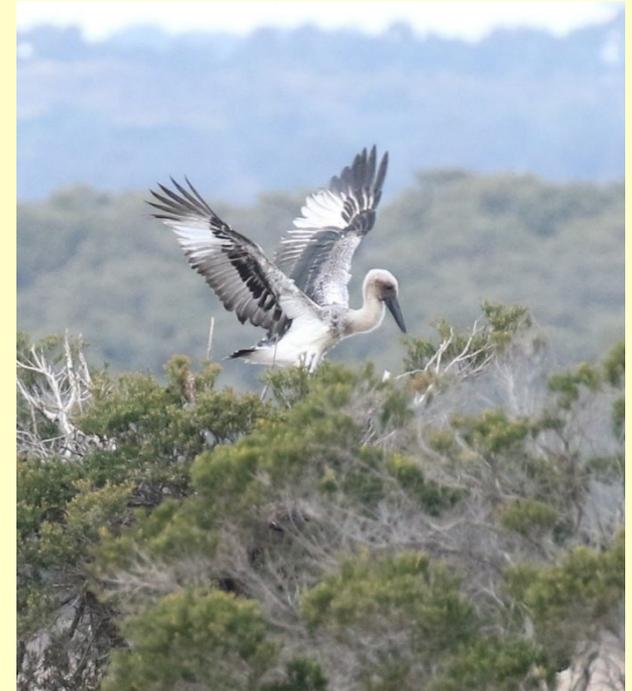
Black-necked Stork

- Sightings in the estuary were rare until late 2013, especially during surveys
- The Reporting Rate is 39% post-2013
- There now are two breeding pairs
 - Tomago pair has bred at least three times
 - A pair at Hexham has bred at least twice and probably 3-4 times



The first known Tomago chick (photographed at Tea Gardens in the following year)

Breeding success in the Hunter estuary may be what's driving increased sightings elsewhere in the region including a pair now breeding near Stratford, and recent Central Coast records



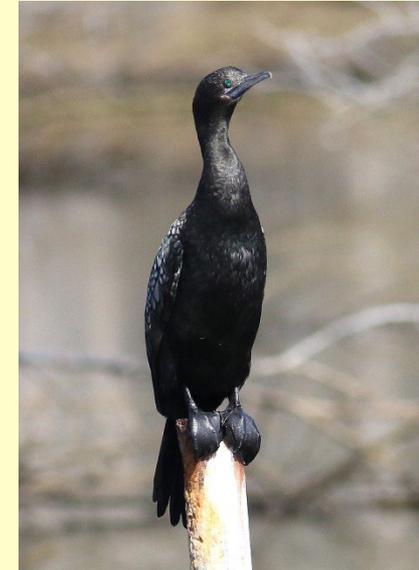
Black-necked Stork chick ready to fledge at Tomago Wetland (photo: Ann Lindsey)



A male on Ash Island

Other large waterbirds

- Increasing populations (statistically significant changes)
 - Australian White Ibis, White-faced Heron, Great Egret, Australian Pelican, Little Black Cormorant, Great Pied Cormorant
 - For some of the above species, the population changes have had strong seasonal aspects
- Decreasing populations (nil with statistically significant results)
 - Australasian Bittern?
 - Potentially there has been loss of habitat but there are insufficient records
 - Egrets?
 - The HBOC surveys suggest stability. Numbers have been fluctuating at the Shortland breeding colony but the trends there seem to be downwards.



Little Black Cormorant



Great Egret at the Shortland colony

Winners and losers (population trends)

Increasing

Shorebirds

Pacific Golden Plover, Sharp-tailed Sandpiper, Grey-tailed Tattler
Pied Stilt, Black-fronted Dotterel,
Red-kneed Dotterel, Masked Lapwing

Gulls & terns

Whiskered Tern, Aust. Gull-billed Tern, Caspian Tern

Waterbirds

Aust. Wood Duck, Pacific Black Duck, Grey Teal, Chestnut Teal, Purple Swamphen, Eurasian Coot, Black-necked Stork, Aust. White Ibis, White-faced Heron, Great Egret, Australian Pelican, Little Black Cormorant, Great Pied Cormorant

Decreasing

Shorebirds

All other migratory shorebirds

Gulls & terns

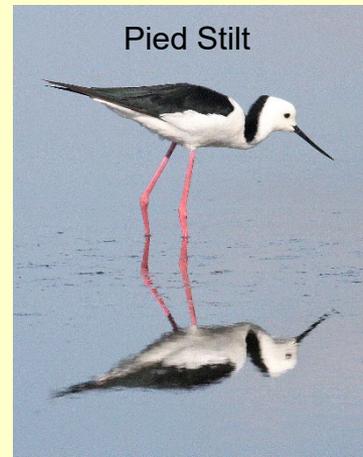
Silver Gull

White-winged Black Tern

Common Tern

Waterbirds

Nil (*Aust. Bittern??*)



Seasonality

(Species with significantly different seasonal populations)

Gulls and Terns

	Summer	Autumn	Winter	Spring
Silver Gull	✓	✓		
Greater Crested Tern	✓	✓		
Caspian Tern		✓		
Whiskered Tern				✓
Common Tern			X	
Little Tern	✓			✓

✓ numbers rise
X numbers drop

Seasonality

(Species with significantly different seasonal populations)

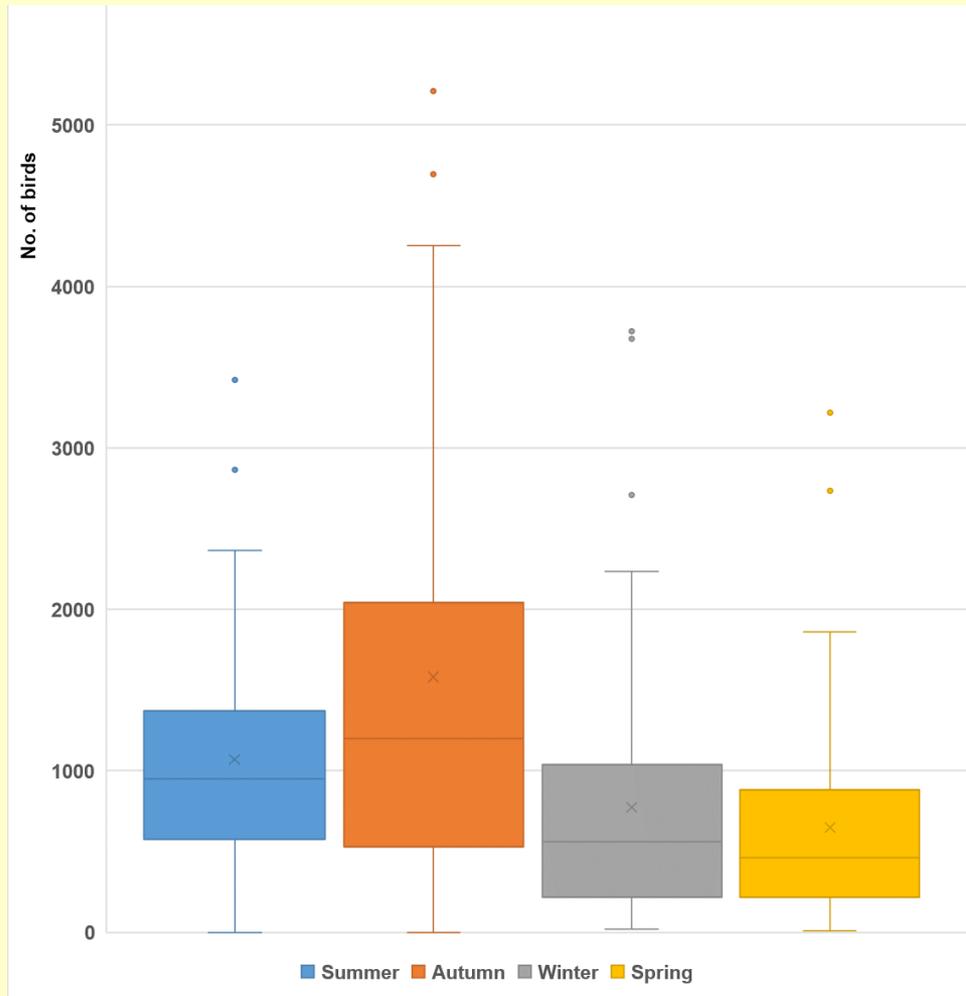
Waterbirds

	Summer	Autumn	Winter	Spring
Black Swan			✓	
Aust. Shoveler [#]		✓		X
Pacific Black Duck	✓	✓		
Grey Teal [#]		✓		
Chestnut Teal		✓		
Australasian Grebe		✓		
Hoary-headed Grebe [#]	X			
Royal Spoonbill	✓	✓		
Australian White Ibis	✓	✓		
White-faced Heron				X
Australian Pelican	✓	✓		
Great Pied Cormorant	✓			✓

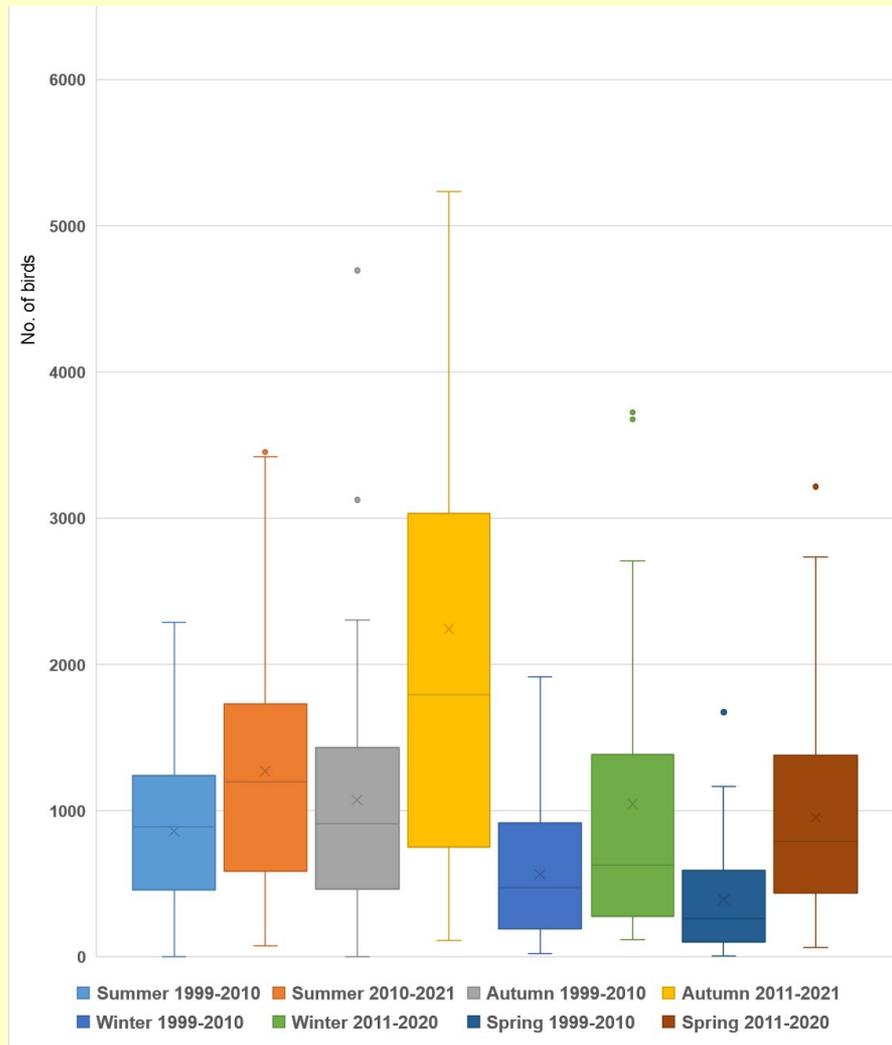
✓ numbers rise X numbers drop

[#]The presence/absence patterns have changed over time for these species

Seasonality (All small waterbirds)



Seasonality (All small waterbirds)



In conclusion

- Restoration of tidal flushing has benefitted many species
- The Hunter estuary is important for many shorebird/waterbird species in times of inland drought
- Is the contamination of Fullerton Cove affecting shorebirds?
 - Loss of benthic food sources
 - Chronic toxicity studies are urgently needed, and a clean-up plan
- It has been a team effort – c 200 people have helped with the surveys (and with many long-termers)
- Cooperation (“partnership”) with land owners/managers has been essential to success
 - NPWS, Hunter Local Land Services, NCIG
- Local interpretations of data complement a national database



Wader ID training session at Stockton Sandspit

Let's count some blessings

- The Hunter Estuary is a fantastic asset!
- Much of it is protected (Hunter Wetlands NP)
- Much of it is pro-actively managed
 - Tomago, Hexham and Ash Island rehabilitation projects
 - Kooragang Dykes restoration work
 - Mangrove control measures
 - Fox baiting program



Out on the Tomago saltmarsh



During a Tomago survey

Photos: Ann Lindsey



Kooragang Dykes

It's time to celebrate!



A special thanks to all the present and past HBOC members who have helped over the 23 years!