2023 Eastern Australian Waterbird Aerial Survey

Executive Summary

- The annual Eastern Australian Waterbird Aerial Survey (EAWS) began in 1983 to monitor annual continental scale changes in the distribution and abundance of waterbirds and their breeding, as well as change in the extent of wetland habitat over time. It tracks trends in more than 50 species of waterbirds.

- In 2023 (41st survey), dry conditions returned to much of eastern Australia (August-October) after record breaking rainfalls and flooding in 2022. Small areas of Queensland NSW are in drought or are drought affected.

- Wetland area decreased considerably from the previous flood year, to well below the long-term average. Some rivers and wetlands in the northern Lake Eyre Basin including the Diamantina and Georgina rivers, retained water in deeper channels and pools after moderate flooding and supported large numbers of waterbirds.

- After record high breeding in 2022, most game species of ducks had abundances well above long term

2023 Eastern Australian Waterbird Aerial Survey Results (continued)

10. Wetland area index (192,083 ha), decreased considerably from the previous flood year, to well below the long-term average. Some rivers and wetlands in the northern Lake Eyre Basin including the Diamantina and Georgina rivers, retained water in deeper channels and pools after moderate flooding and supported large numbers of waterbirds (Fig.7). Bands 2, 3 & 4 contained the largest areas of habitat – comprising 64% of the inundated wetland area sampled (Fig.2). Important habitat areas included Macquarie Marshes, Lowbidgee wetlands, Paroo Overflow lakes, Talyawalka Creek, Menindee Lakes and Proserpine Dam and Lakes Galilee and Moondarra in the north (Fig. 5).

11. The Macquarie Marshes had less extensive flooding than the previous year and supported relatively low numbers of waterbirds; no breeding colonies were active. The Lowbidgee wetlands also had intermediate inundation extent and supported moderate numbers of waterbirds and very low breeding. Most wetlands in the regulated Menindee Lakes system were full, including outside the survey band to the north - Copi Hollow and Lakes Wetherell, Pamamaroo, Bijiji and Balaka. Overall, there were moderate waterbird numbers and little breeding activity on these wetlands. The Talywalka Lakes systems also held considerable water and moderate to high numbers of waterbirds (Fig. 7).

12. Waterbirds had 72% of their total abundance distributed across thirty wetlands, making them less spatially concentrated and more evenly spread than the previous year. Nevertheless, two Band 8 wetlands (Lakes Torquinnie and Mumbleberry) supported more than 180,000 waterbirds representing 31% of the total abundance (Fig. 5). These wetlands together with the Talywalka Lakes and Proserpine Dam generally supported large numbers of waterbirds and high species diversity (Figs 2 & 6). Conversely around 40% of surveyed wetlands supported no

2023 Eastern Australian Waterbird Aerial Survey
Results (continued)

16. Selected species distribution and abundances are shown in Figures 10-20; Freckled Duck, Plumed Whistling Duck and Pelicans were included for comparison with game species. Map plots in these figures show 2023 distribution and trend plots show changes in abundance over time (1983-2023). Horizontal lines in trend plots indicate the long-term average.

17. Across Eastern Australia overall abundance, breeding index and breeding species richness were positively related to available habitat (wetland area index). Conversely, declines in wetland area were likely to result in declines in waterbird abundance, breeding and breeding species richness (Fig. 9).

Methods

Methods are described in detail in Braithwaite et al. (1985) and Kingsford et al. (2020) – a short description follows here. All waterbirds (including nests and broods) were counted from high-winged aircraft (e.g. Cessna 206 or 208) at 167– N P K U í D Q G D K46 nJ kW 150 m of the wetland's shoreline where waterbirds concentrated. A front-right observer (navigator) and a back-left observer independently record counts on audio recorders, with their combined counts making up a completed count. Counts are attributed on the recorder to a unique number for each wetland, and a geolocation (longitude, latitude), as well as the exact time of day the count commenced. All timing is synchronised to GPS time – this enables audio counts to be linked to location via a GPS track log of the flight path. The percent fullness (inundated area) of each wetland is also estimated, relative to the mapped high-water mark. Inundated areas (haJ 0.001 Tw3.2 (e1.31 (t)-1.1 (r)-6.3 (i)3.1 (but)-1.2 (ed)-12.130 1

Acknowledgements

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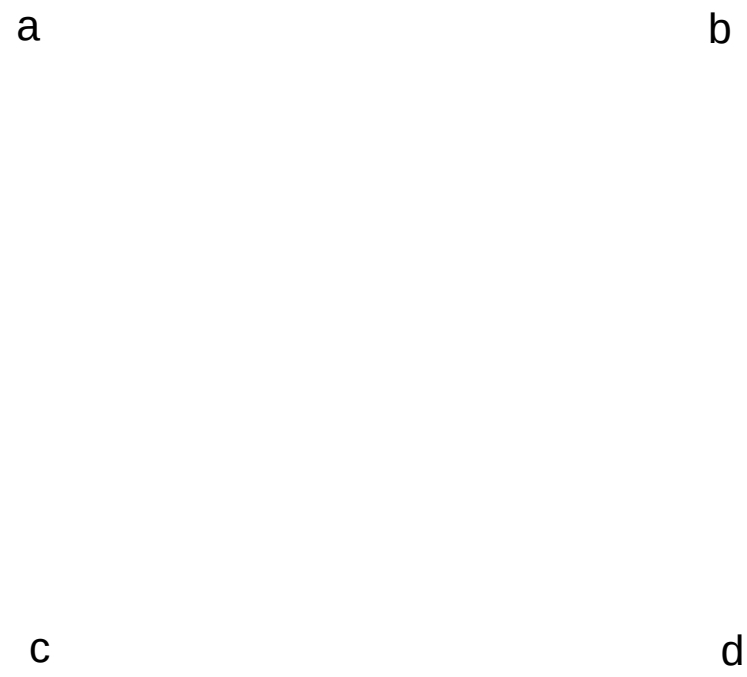


Figure 1 . Changes over time in a) total abundance, b) wetland area, c) breeding and d) number of breeding species in the Eastern Australian Waterbird Aerial Survey transects (1983-2023); horizontal lines show long-term averages.

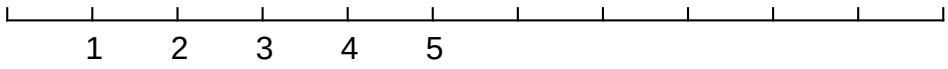


Figure 2 . Distribution of waterbird abundance, breeding index and wetland area index in survey bands 1-10 (south to north respectively) of the Eastern Australian Waterbird Aerial Survey in 2023.

Figure 3

Figure 4 . Decadal means of a) wetland area index, b) total abundance index, c) number of breeding species and d) breeding index in the Eastern Australian

Figure 5 . Distribution and abundance of waterbirds in the 2023 Eastern Australian Waterbird Aerial Survey bands. Dry wetlands and those with zero waterbirds not plotted.

2023 Breeding index – 6,036

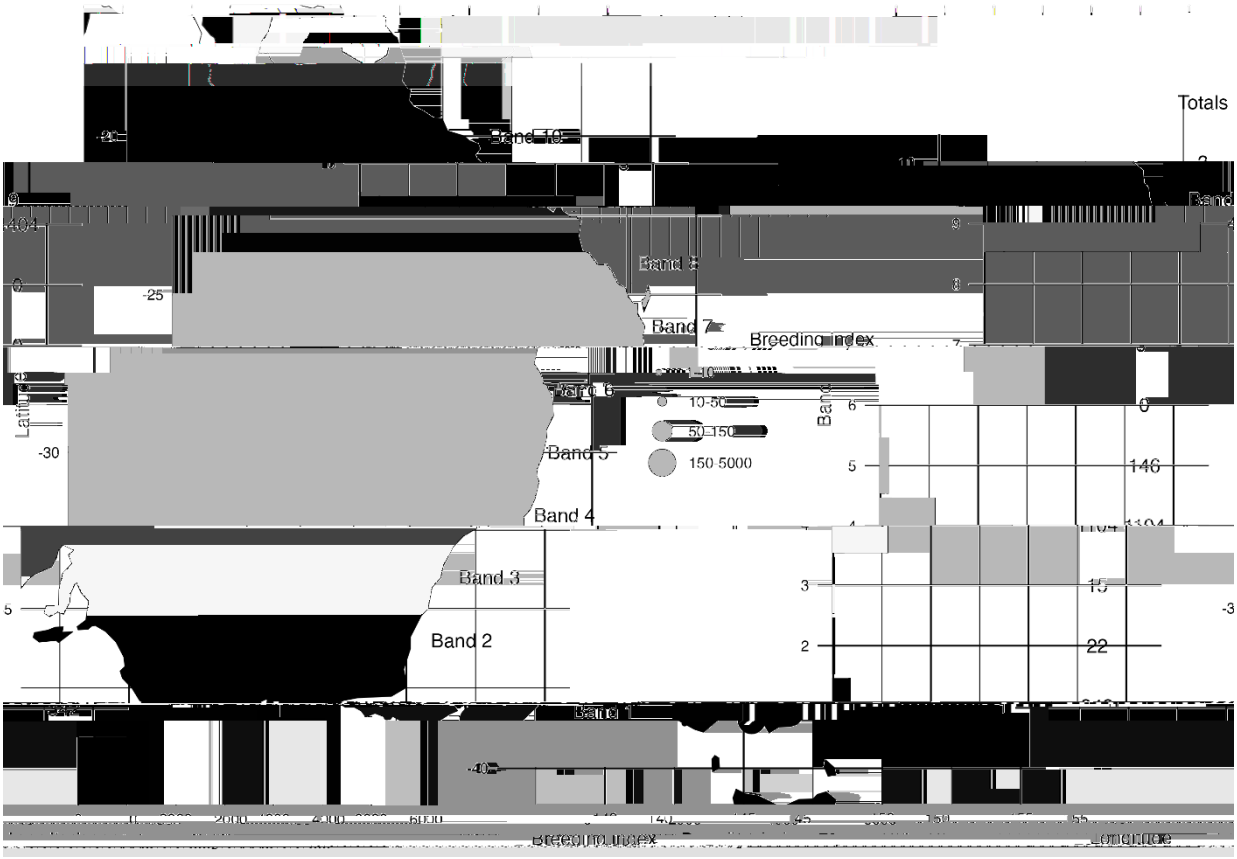


Figure 6 . Distribution of waterbird breeding in the 2023 Eastern Australian Waterbird Aerial Survey bands. Only wetlands with breeding recorded are plotted.

2023 Wetland area index –

Figure 7 . Distribution of wetland area in the 2023 Eastern Australian Waterbird Aerial Survey bands. All surveyed wetlands with surface water present are plotted; dry wetlands are not plotted.

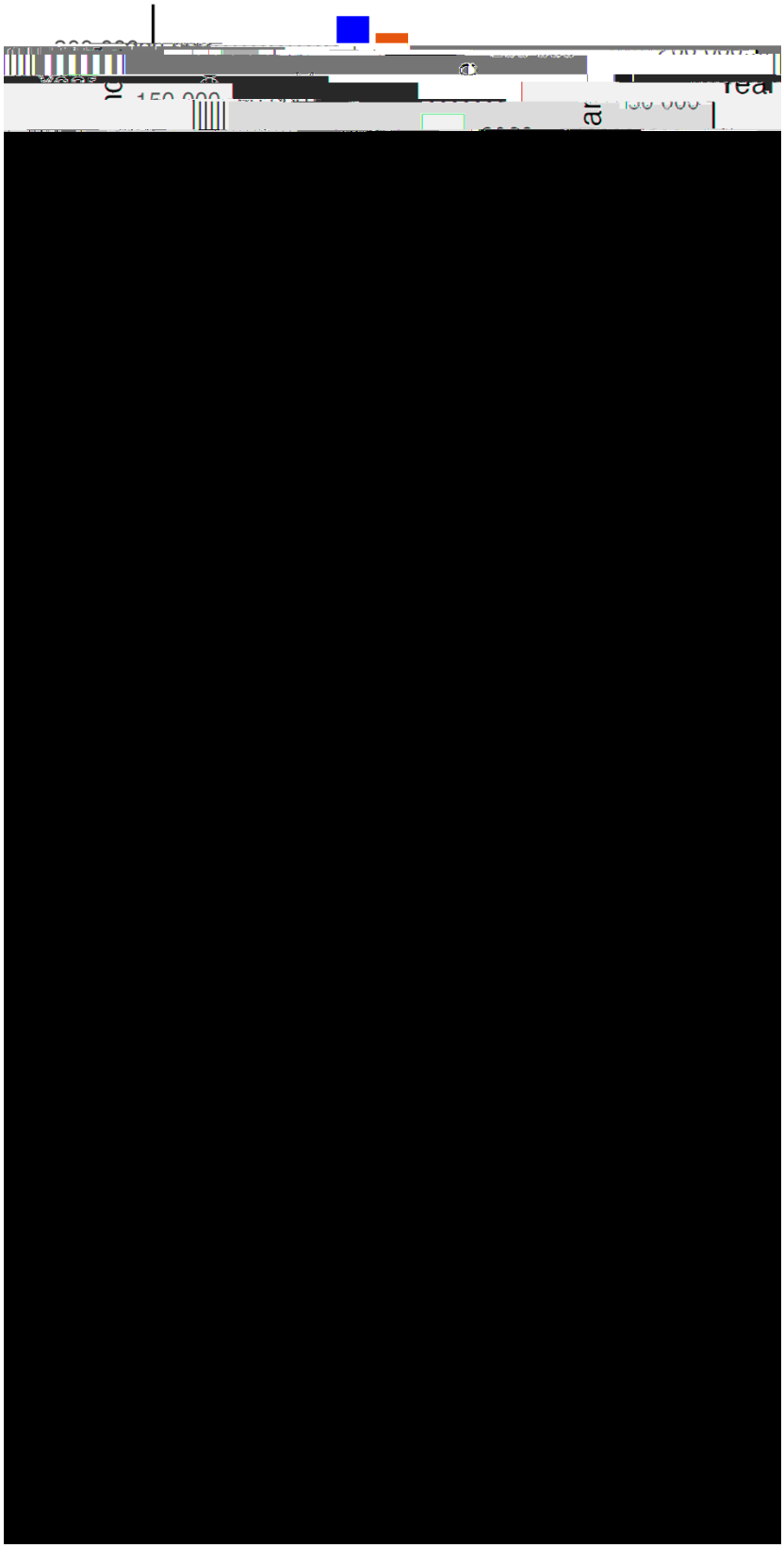


Figure 8 . Comparison of waterbird abundance, breeding and wetland area indices in major river basins 2022-2023.

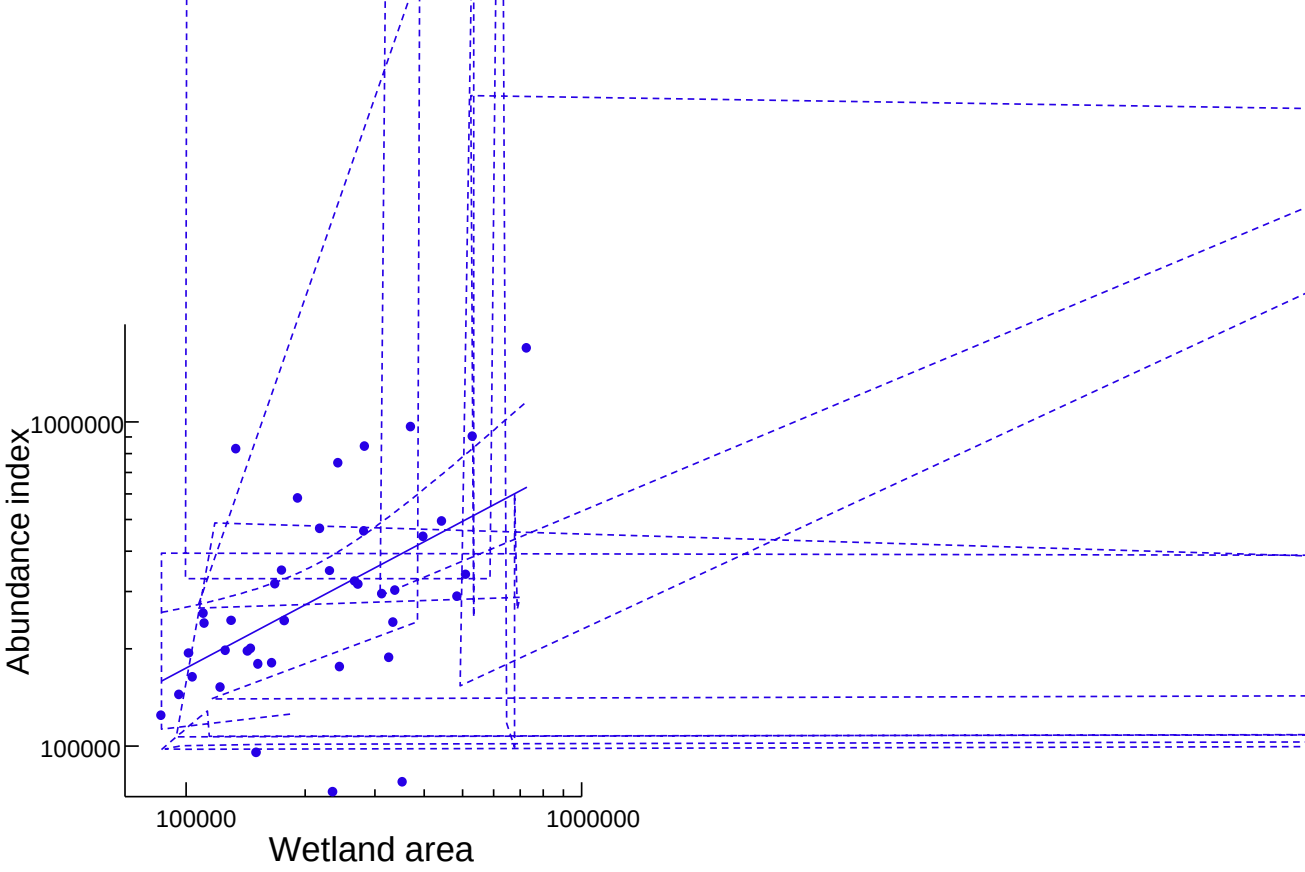


Figure 9 . Significant positive interactions between abundance index, breeding index and number of breeding species with wetland area index (ha) for the Eastern Australian Waterbird Aerial Survey (1983-2023). Dashed lines are 95% confidence limits.

Pacific Black Duck

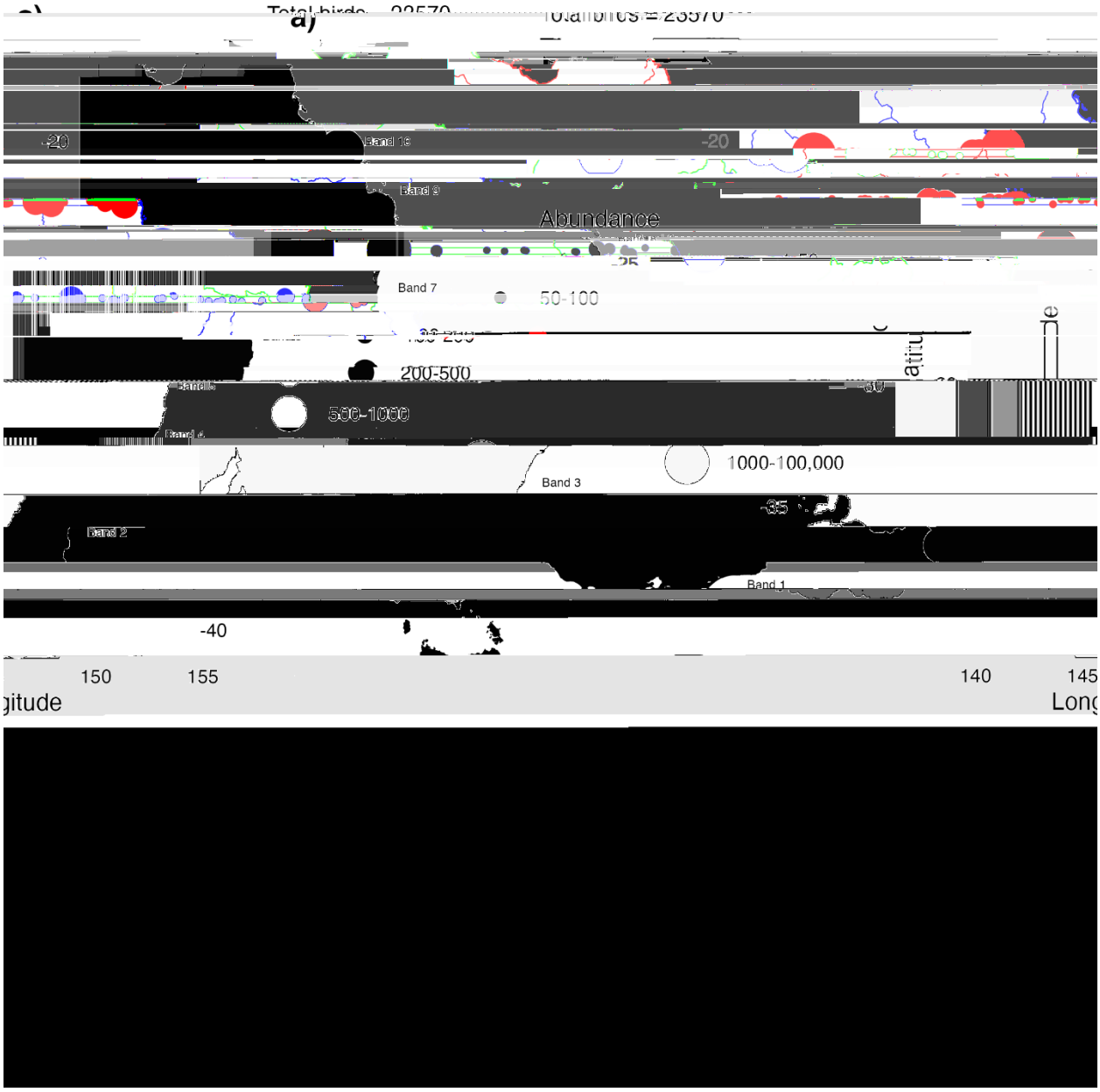


Figure 10 . a) Distribution and abundance of Pacific Black Duck during the 2023 Eastern Australian Waterbird Aerial Survey. B) Changes in abundance (1983-2023).

Chestnut Teal

Figure 12 . a) Distribution and abundance of Chestnut Teal during the 2023 Eastern Australian Waterbird Aerial Survey. b) Changes in abundance index (1983-2023).

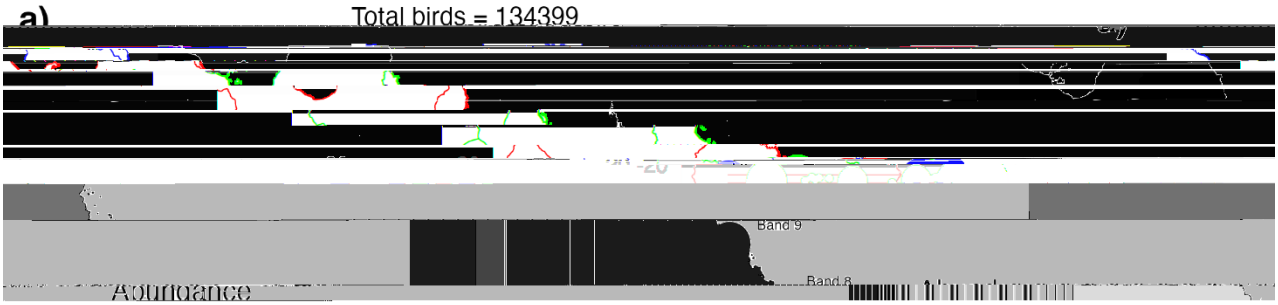


Figure 13 . a) Distribution and abundance of Grey Teal during the 2023 Eastern Australian Waterbird Aerial Survey. b) Changes in abundance index (1983-2023).

Figure 14

Freckled Duck

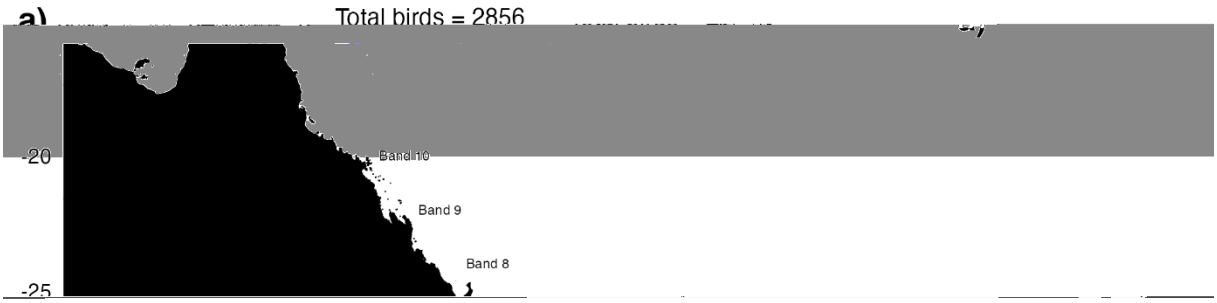


Figure 15 . a) Distribution and abundance of Freckled Duck during the 2023 Eastern Australian Waterbird Aerial Survey. b) Changes in abundance index (1983-2023).

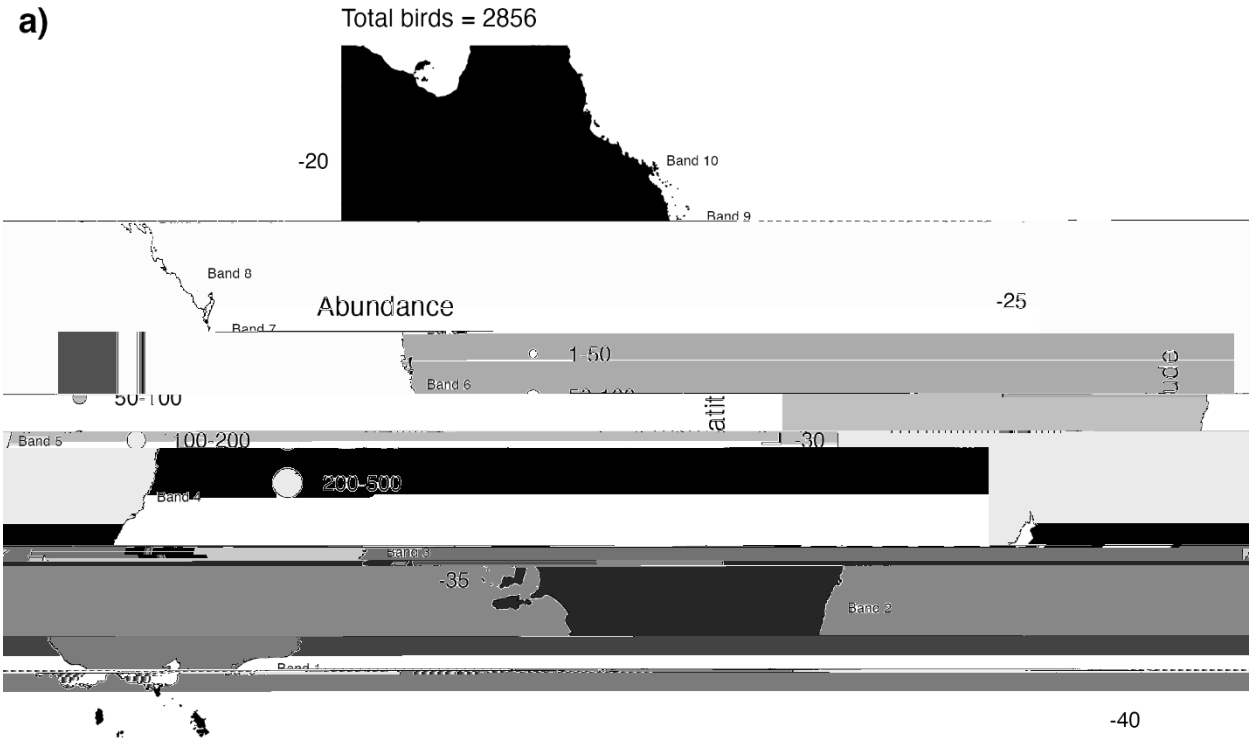
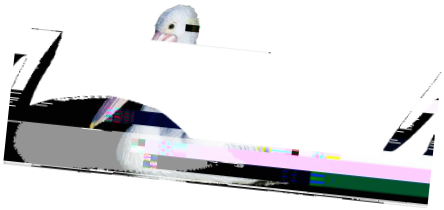


Figure 16 . a) Distribution and abundance of Australian Shelduck during the 2023 Eastern Australian Waterbird Aerial Survey. b) Changes in abundance index (1983-2023).

Australian Pelican



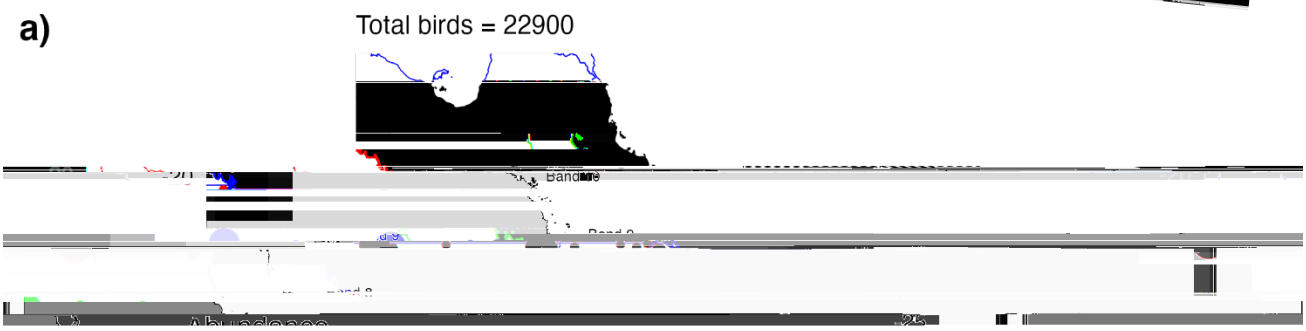


Figure 20 . a) Distribution and abundance of Australian Pelican during the 2023 Eastern Australian Waterbird Survey. b) Changes in abundance index (1983-2023).

References

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