The status of the White-fronted Chat in the Hunter Region, NSW

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Records of White-fronted Chat *Epthianura albifrons* in the Hunter Region from 1969-2023 were analysed for annual Reporting Rate and maximum monthly count. The majority of the records were from Ash Island, Kooragang Island, Hexham Swamp and Tomago Wetland in the Hunter Estuary, Gir-um-bit National Park in the Port Stephens estuary, and the Worimi Conservation Lands. The populations at Hexham Swamp and Tomago Wetland have increased while the populations at Ash Island, Kooragang Island and Gir-um-bit National Park have decreased. The population trend at Worimi Conservation Lands could not be determined.

The population increases at Hexham Swamp and Tomago Wetland are attributed to the increase in area of saltmarsh, due to rehabilitation projects. The decrease at Kooragang Island and to a lesser extent at Gir-um-bit National Park is attributed to loss of habitat. The reason for the decrease at Ash Island is uncertain although disturbance may be a factor.

The regional decline in Reporting Rate from 2010 to 2023 was shown to be 64.5% which was in agreement with previous state-wide determinations. The study also highlighted that the sites used to collect data represented a limited selection of the suitable habitat available for this species in the Hunter Region, and the actual distribution and size of the population are not fully understood.

INTRODUCTION

The White-fronted Chat *Epthianura albifrons* is a member of the family Meliphagidae, the honeyeaters and Australian Chats, which is the largest passerine family in Australia (Higgins *et al.* 2001). The species is a saltmarsh and wetland specialist, preferring damp low shrubby open habit such as samphire flats, saltmarsh, saltbush plains and grasslands, especially on the edge of lakes, swamps, dams, estuaries and other wetlands, whether fresh or saline, permanent or ephemeral. In coastal areas, it frequents saltmarsh including samphire and sedges and also can be found in tussock grasslands, sand dunes, the edges of mangrove forests, and paperbark woodlands (Cooper *et al.* 2020). It forages on the ground, mainly for invertebrates and occasionally seeds. Nesting by the species is reported to be concentrated round areas of fresh water (Higgins *et al*. 2001).

The Australian IUCN Red List Status 2020 lists the species as Least Concern due to its extremely large range across southern Australia (BirdLife International 2024). However, in New South Wales (NSW) it is listed as Vulnerable on Schedule 1 of the NSW *Biodiversity Conservation Act 2016*, due to a moderate reduction in population size (NSW Department of Planning and Environment 2021). Jenner *et al*. (2011) analysed NSW Bird Atlassers data to determine change in annual Reporting Rate (RR) for all NSW Bioregions. The majority of White-fronted Chat records from the Hunter Region lie within the Sydney Bioregion. The analysis found a 53% relative decline in RR from 1981 to 2005 and a 32% decline from 1995 to 2005 for the region. Similarly, there was a 52% decline in RR for all of NSW between the 1977-81 and 1998-2002 BirdLife Australia Atlas periods (Barrett *et al*. 2007). Cooper *et al*. (2020) found the species was in serious decline in NSW with the annual RR changing from around 3.5% to less than 1% over the period 1986 to 2006 (70% relative decline). These studies all confirm the Vulnerable listing for the species in NSW based on a moderate reduction in population size.

Hunter Region

Although few bird lists for the Hunter Region prior to the 1960s exist, there were reports of several small flocks of White-fronted Chats between Newcastle and Nelson Bay in 1928 (Chisholm & Cayley 1929) and a bird at Salt Ash in 1931 (Hordern & Hordern 1931). In more recent times, birds were described as being locally common on Kooragang Island (van Gessel & Kendall 1972) and

on Ash Island (Stuart 2002). Throughout the Hunter Region, the species mainly inhabits coastal wetlands and is often seen in small flocks in the Hunter Estuary where it is resident and where it has been recorded breeding (Gosper 1981, Herbert 2007). In 2012 on Ash Island, White-fronted Chats were found to respond rapidly to new foraging opportunities created as the result of a fire that removed existing vegetation (Kyte & Newman 2013).

The objectives of our current study were to establish the distribution of White-fronted Chat in the Hunter Region and determine its population status. The location of the region is shown in **Figure 1**.

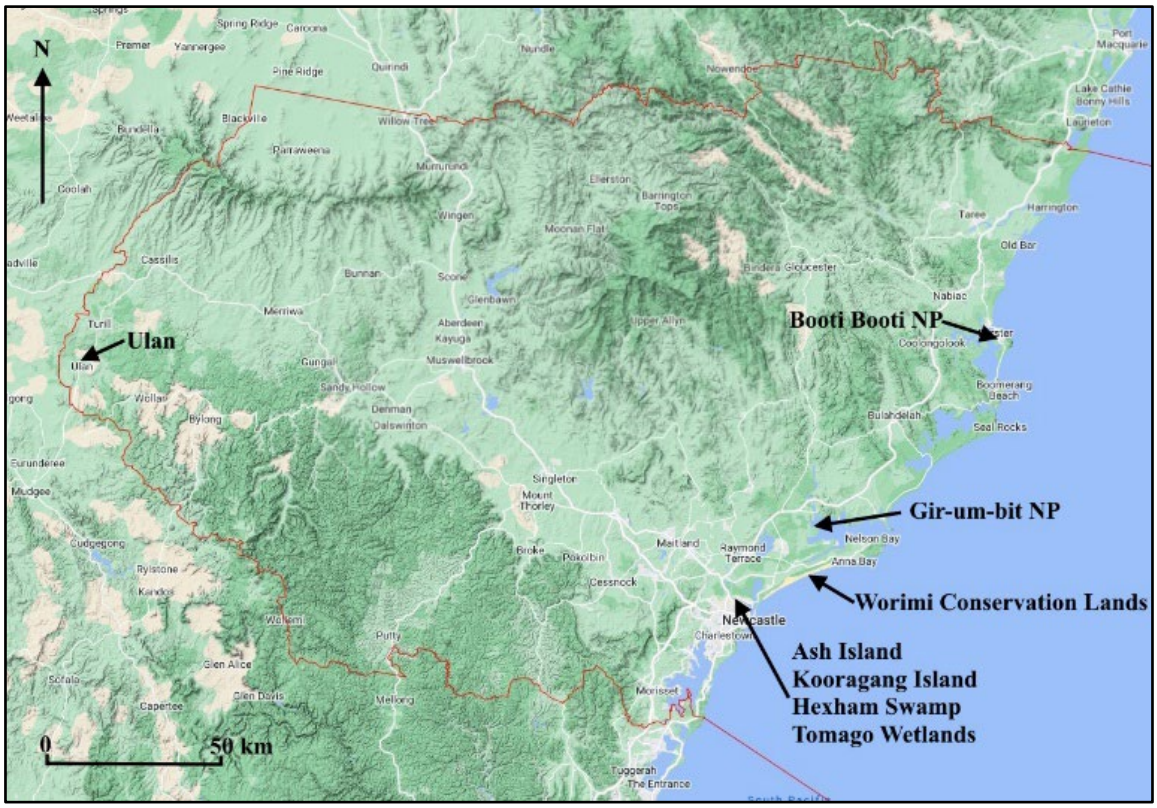

Figure 1. Map showing Hunter Region boundary (in red) and main sites with White-fronted Chat records. Image Birdata https://birdata.birdlife.org.au/explore#map=-33.2829441_153.1320520_7&region_id=20.

METHODS

Records for White-fronted Chat were extracted from the BirdLife Australia Birdata portal (https://birdata.birdlife.org.au/home), the Cornell Lab of Ornithology eBird Australia portal (https://ebird.org/australia/home) and the NSW Department of Environment and Heritage BioNet Atlas (https://atlas.bionet.nsw.gov.au/). Other records were extracted from Annual Bird Reports for the Hunter Region (https://www.hboc.org.au/publications/annual-bird-report/) for years 1993-2019 and from a spreadsheet of early avian records (1979-1993) for the Hunter Region (A. Stuart pers. comm.). Additional early records were obtained from Kooragang Island Bird Counts for 1969-1977 (van Gessel & Kendall 2015).

Sites with regular survey effort over extended periods were identified and their records compiled. The maximum and mean counts for months that birds were present were determined for each site and for the region.

The annual RRs for the sites were extracted from the BirdLife Australia Birdata portal. Birdata only provided RRs for those years that had more than 30 surveys. (RR is the number of records for a species divided by the number of surveys, expressed as a percentage). Only the data from 500 m, 5 km, fixed route and shorebird surveys were used. This was done to minimise potential bias resulting from the large number of 2 ha/20 min and incidental surveys from Ash Island and Hexham Swamp in some years. The annual RR data for six sites and for the region were charted using Microsoft Excel.

RESULTS

A total of 53 sites with White-fronted Chat records were identified, extending from Coopernook in the north of the region to Lake Macquarie in the south. Most of the sites were in near-coastal regions, with outliers at Gloucester and Maitland. A single inland site was identified at Ulan on the region's western

boundary. The records located spanned 1970-2023. The period over which records were available, the numbers of records and the maximum and mean monthly counts are summarised in **Table 1**.

Table 1. The record periods for each White-fronted Chat site, and the numbers of records and the maximum and mean monthly counts at each site.

Site	Record Period	Number of Records	Maximum Monthly Count	Mean Monthly Count
Hunter Region	1969-2023	2,737	85	10.2
Ash Island	1997-2023	734	60	6.5
Kooragang Island + Stockton Sandspit	1969-2017	256	60	8.6
Hexham Swamp	1979-2023	1,101	75	12.6
Tomago Wetland	2007-2023	324	47	10.0
Gir-um-bit NP, Swan Bay	1980-2023	144	34	5.6
Worimi Conservation Lands, Stockton Bight	1999-2023	44	14	8.9
Booti Booti NP, Wallis Lake	1985-2010	30	4	1.3
Ulan	2013-2021	20	4	2.3
Other (45 sites)	1970-2019	84	20	-

The majority of the records (95%) were from six sites: Ash Island; Kooragang Island; Hexham Swamp; Tomago Wetland; Gir-um-bit National Park (NP); and Worimi Conservation Lands (WCL). The first four sites are located in the Hunter Estuary, the Swan Bay site (Gir-um-bit NP) is in the Port Stephens Estuary and the WCL site is on Stockton Bight. The Kooragang Island site included records from Stockton Sandspit. Records for Ash Island and Kooragang Island were from 1999 onwards, Gir-um-bit NP from 2000, Tomago Wetland from 2007, and Hexham Swamp and Worimi Conservation Lands from 2009. Total count data were available for most sites from 2010 onwards. Apart from Booti Booti NP and Ulan, the other sites generally had only 1-2 records each.

Charts of Annual RR for the region are presented in **Figure 2** and for the six main sites in **Figures 3-8**. All available Birdata RR records from 500 m, 5 km, fixed route and shorebird surveys were used.

Hunter Region

The annual RRs for the Hunter Region for 2000-2023 are shown in **Figure 2** together with the linear trendline. Applying the trendline equation to the annual rates indicates a change in RR from 6.6% to 2.3% over the period. This is a decline of 64.5% over 24 years.

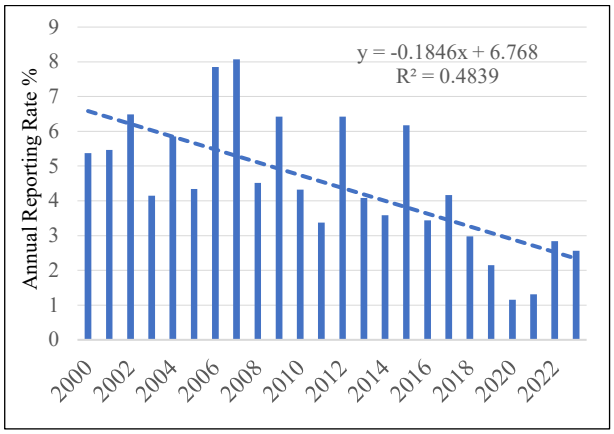

Figure 2. Annual Reporting Rate for White-fronted Chat in the Hunter Region, 2000-2023 with linear trendline and regression equation.

Ash Island

Figure 3 shows the annual RRs for Ash Island for 1999-2023. A decline was evident from 2003 and from 2012 it declined exponentially. After 2017 there were almost no records from the site until 2023 when there was a one-off record of 50 birds.

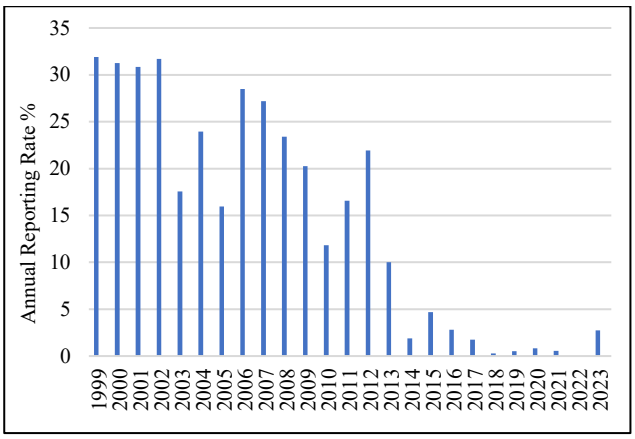

Figure 3. Annual Reporting Rate for White-fronted Chat at Ash Island 1999-2023.

Hexham Swamp

Figure 4 shows the annual RRs for Hexham Swamp from 2009-2023. It shows an uncertain trend increasing from 2012 to 2015, then remaining relatively unchanged.

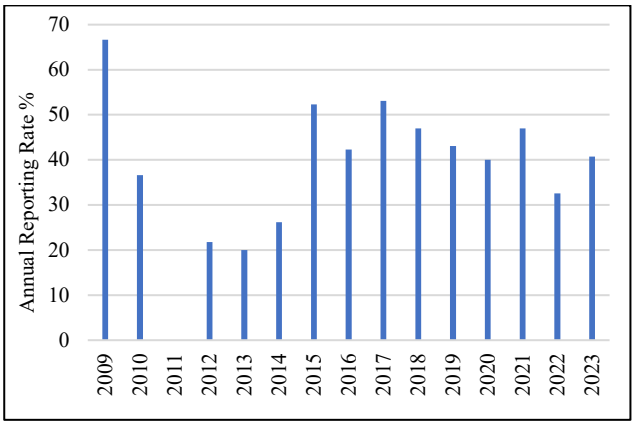

Figure 4. Annual Reporting Rate for White-fronted Chat at Hexham Swamp 2009-2023.

Kooragang Island and Stockton Sandspit

The annual RRs for Kooragang Island and Stockton Sandspit from 1999-2023 are shown in **Figure 5**. The majority of the records were from Kooragang Island and only 12 were from Stockton Sandspit. A rapid decline is evident from 1999 until 2012. Subsequently, the only record was in 2017.

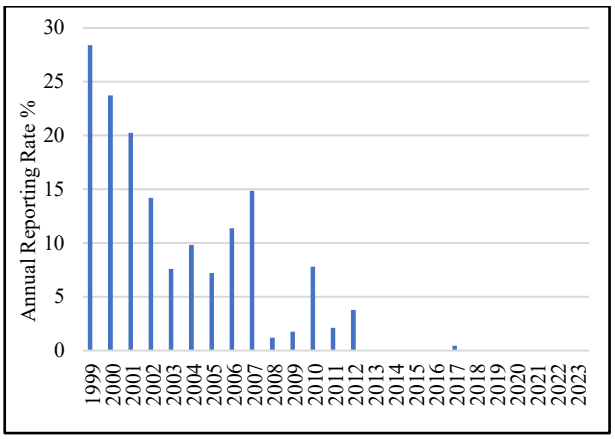

Figure 5. Annual Reporting Rate for White-fronted Chat at Kooragang Island and Stockton Sandspit 1999-2023.

Gir-um-bit National Park

Figure 6 shows the annual RRs for Gir-um-bit NP from 2010-2023. The number of data points is limited and there is no trend evident.

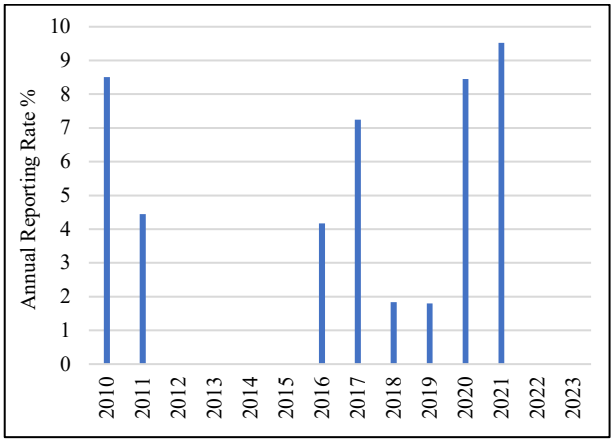

Figure 6. Annual Reporting Rate for White-fronted Chat at Gir-um-bit NP 2010-2023.

Tomago Wetland

The annual RRs for Tomago Wetland for 2010-2023 are shown in **Figure 7**. There is an uncertain trend: RR increased from 2010 to 2020, followed by a decline.

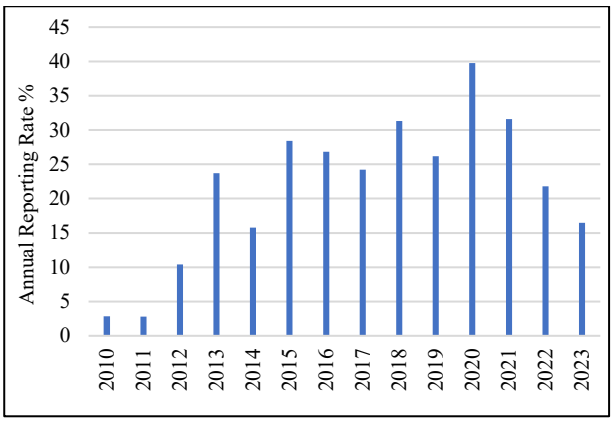

Figure 7. Annual Reporting Rate for White-fronted Chat at Tomago Wetland 2010-2023.

Worimi Conservation Lands

Figure 8 shows the annual RRs for Worimi Conservation Lands from 2014-2023. The data set is limited and no clear trend is evident.

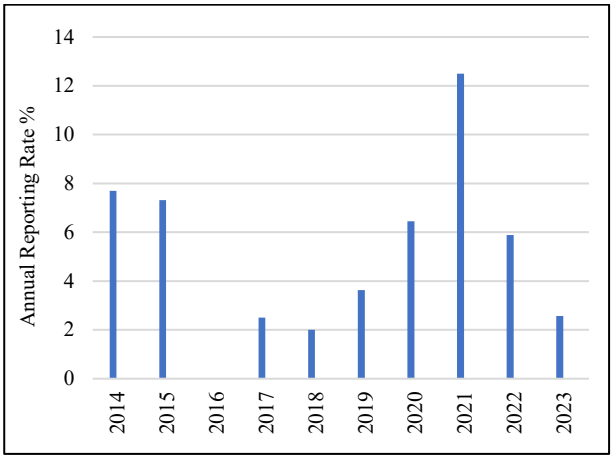

Figure 8. Annual Reporting Rate for White-fronted Chat at Worimi Conservation Lands 2014-2023.

DISCUSSION

The majority of the White-fronted Chat records were from sites in coastal areas, mainly around the Hunter and Port Stephens estuaries, plus a small number from Wallis Lake. However, these sites were chosen for surveying mainly because of their shorebird roosting habitat. There are many other sites in Hunter coastal regions with potentially suitable habitat for chats, which have not been surveyed. These include other parts of the Hunter and Port Stephens estuaries, the Lower Myall River, other parts of Wallis Lake and the Manning Estuary.

Threats to White-fronted Chat

The major threats to White-fronted Chat populations in coastal areas are reduction in habitat size and quality, human disturbance, and elevated nest-predation levels (NSW Department of Planning and Environment 2021). The species nests on the ground. Mangrove encroachment and sea-level rise associated with climate change present additional future threats to their preferred habitat. The species is strongly habitat-specific and sensitive to human disturbance and is unable to persist in the urbanised environments that often impinge on coastal saltmarsh (Jenner *et al.* 2011; Major & Sladek 2012). As populations become smaller and more isolated, genetic variability is lost along with recruitment opportunities from other nearby populations (Jenner *et al*. 2011; Major & Sladek 2012).

In the Hunter Region the White-fronted Chat is subject to all of the above threats although the extent of the threat may vary at different sites. However, as the sites in the Hunter Estuary are only a few km apart, the factors that influence population at a particular site should not be considered in isolation.

Hunter Estuary

Among the reasons for the decline of species numbers in the Hunter Estuary is the destruction of habitat. Over the past 200 years, tidal creeks have been filled in and the number of major islands in the river delta reduced from 21 to six (Williams *et al.* 2000). It has been established that over 80% of saltmarsh in the Hunter Estuary has disappeared since European settlement; in the lower estuary the area with saltmarsh decreased by 1400 ha between 1954 and 1994 (Williams *et al.* 2000). Construction of the Port Waratah Coal Terminal from 1982 and the Newcastle Coal Infrastructure Group terminal from 2008 resulted in the destruction of most of the remaining estuarine habitat on Kooragang Island, e.g. the Big Pond (Stuart & Lindsey 2021). Efforts to redress the situation began with the gazetting of Kooragang Nature Reserve in 1983, followed by the commencement of the Kooragang Wetland Rehabilitation Project (which included Stockton Sandspit, Ash Island and Tomago Wetland) in 1993 and the Hexham Swamp Rehabilitation Project in 2006.

Ash Island

The cause of the population decline on Ash Island is not known but the factors may include a combination of habitat change and increased

disturbance. However, recent habitat rehabilitation and modification may have been beneficial for White-fronted Chat populations. At the Fish Fry Flats site, mangroves were removed and mudflats and saltmarsh re-established as part of a rehabilitation project (Reid 2019). In June 2023, 50 chats were observed moving through the new saltmarsh (A. Stuart pers. comm.).

Kooragang Island and Stockton Sandspit

White-fronted Chat are no longer recorded on Kooragang Island or Stockton Sandspit although the reasons for its demise may be different at each site. In their *Checklist of the birds of Kooragang Island*, van Gessel and Kendall (1972) describe it as a breeding resident and rather common, with a maximum number of 50 birds recorded in August 1971 (van Gessel & Kendall 1972). At that time chats inhabited the areas where the two coal terminals were subsequently built (F. van Gessel pers. comm.).

On the other hand, Stockton Sandspit is within the Hunter Wetlands National Park and efforts to maintain it as a shorebird roost site have been successful. However, it is a small area of only approximately 10 ha. It is likely that the chat population was not large enough to be sustainable on such a small site which is constantly visited by fishermen and birdwatchers. In addition, there is little opportunity for population recruitment as the surrounding area has unsuitable habitat (being either urban, or riverine mangroves).

Hexham Swamp

Regular surveys of the eastern side of Hexham Swamp commenced in 2009, not long after the process of restoring tidal flushing to part of the swamp began in 2008. Although a range of wetland vegetation existed in the swamp (total area 2000 ha), over 1000 ha was Common Reed *Phragmites australis* (Winning & Saintilan 2009) which is unsuitable for White-fronted Chat. Tidal gates were progressively opened between 2008 and 2013 (Local Land Services 2022). A vegetation survey in 2021 found the area of mangroves had increased to 185 ha, saltmarsh to 109 ha and tidal mudflats and shallow ponds to 135 ha. The area of freshwater reed had reduced to 792 ha (Local Land Services 2022). The decrease in Common Reed and the creation of a mosaic of saltmarsh, mudflats and shallow ponds provided more habitat for White-fronted Chat and its population has increased. This is also evident in the RR trend which has increased until 2015, the remained relatively unchanged. Whilst the population of the species is stable at the moment, Grey Mangrove *Avicennia marina* is becoming the dominant vegetation on the eastern side of the swamp (AL pers. obs.) and its progressive advance into areas of saltmarsh may affect the chat population in the future.

Tomago Wetland

In 2007, members of Hunter Bird Observers Club commenced regular monthly surveys of a section of Tomago Wetland (450 ha in total area) to gather baseline data before the Tomago Wetland Rehabilitation Project commenced and tidal flushing to part of the wetland was reinstated (Lindsey & McNaughton 2012). White-fronted Chat was recorded in small numbers (1-3 birds) although the presence of 12 birds in June 2008 (Lindsey & McNaughton 2012) may indicate that a larger population was present. Expansions to the tidal footprint occurred in three stages – in 2008, 2011 and 2012-2015 (Lindsey 2021). The change from grassland to saltmarsh and sedges benefitted chats by providing additional habitat, and the maximum monthly count increased to become regularly more than 15 birds. The annual RR increased accordingly until 2020. However, the replacement of grassland by estuarine vegetation continues to be compromised by the limited tidal flushing of large areas to ensure that salt water does not encroach on adjacent private land. Human disturbance is minimal as the site is closed to the general public. The only site visitors are birdwatchers twice monthly, researchers and site managers. A fox abatement program and a program to manage introduced deer by National Parks and Wildlife Service (J. Erskine pers. comm.), have both contributed to the prevention of nest predation and trampling of saltmarsh.

Gir-um-bit National Park

White-fronted Chat are limited to the mudflats and saltmarsh in the Gir-um-bit National Park section of the Swan Bay survey area. The earliest record from the area was Bartrim (1980) who reported up to 18 birds in the saltmarsh year-round. Since 2000, maximum monthly counts of around ten birds were common. With limited data, the population trend is uncertain. Habitat loss has occurred gradually over the past 45 years. Mangroves have encroached on areas of saltmarsh and inundation of the site by high tides has become more frequent (Fraser *et al.* in prep.). The site is generally undisturbed, apart from monthly bird surveys by HBOC members.

Worimi Conservation Lands

During regular monthly surveys of the Worimi Conservation Lands, White-fronted Chats were mostly found behind the foredunes, in swales which fill with water after heavy rain, but then dry out rapidly. The vegetation in these swales is generally thicker and more diverse than surrounding areas and thus provides constant habitat for White-fronted Chat, except under drought conditions. Disturbance from off-road vehicles is common along the beach front and in some areas of the dunes.

Hunter Region population trend

The species is listed as Vulnerable under the NSW *Biodiversity Conservation Act 2016*. This listing requires a demonstrated decline of 30% over 10 years (NSW Department of Planning and Environment 2021). Our study has shown a decline of 64.5% in annual RR for the Hunter Region over the period 2010-2023. This change is in accord with the determination of the NSW Scientific Committee in 2010 (NSW Department of Planning and Environment 2021) and subsequent findings by other researchers (Jenner *et al.* 2011; Cooper *et al*. 2020).

CONCLUSIONS

Our study has confirmed that the population of White-fronted Chat in the Hunter Region is declining at rates comparable with previous state-wide determinations. However, the analysis is limited largely to a geographically restricted area comprising parts of the Hunter and Port Stephens estuaries only.

In the Hunter Region, White-fronted Chat populations are small, fragmented and vulnerable to extinction as a result of habitat destruction/ modification and disturbance. Populations continue to survive in the Hunter Estuary at Tomago Wetland and Hexham Swamp where, as part of two restoration projects, tidal flushing was reintroduced. As a result, the area of saltmarsh expanded and water quality and biodiversity improved, potentially resulting in more foraging opportunities for this wetland habitat specialist. However, both sites are compromised as there is a lack of reliable tidal flushing at Tomago Wetland to support the saltmarsh and, at Hexham Swamp, mangroves are taking over the re-established saltmarsh areas. Human disturbance would increase at the latter site if a proposed cycleway was installed.

The populations on Kooragang Island and Stockton Sandspit disappeared due to habitat loss and/or disturbance. The causes for the species' demise on Ash Island are uncertain but habitat modification and disturbance have probably played a role. Habitat loss may also be influencing a reduction in the population at Gir-um-bit NP.

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