

Observations and dispersal of black-billed gulls (tarāpuka, *Chroicocephalus bulleri*) banded at North Canterbury, New Zealand, 1958–1974 and 1983

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Abstract: A total of 15,694 black-billed gulls (tarāpuka, *Chroicocephalus bulleri*) chicks were banded at six braided gravel-bed rivers in North Canterbury, New Zealand, from 1958 to 1983, and at least 1,754 later sightings of dead or alive birds were reported to the Banding Office. The main banding sites were the Ashley River and its major tributary, the Ōkūkū River; other banding was carried out on the Kowhai River near Kaikoura, Conway River, Waiau River, Waipara River, and Waimakariri River. Colonies typically shifted location between years, as flooding and weed growth affected the habitat and suitability for nesting. Up to 6 colonies were found on the Ashley River system in a season. Average size of all colonies was about 230 nests, with the largest reaching about 800 nests. Some birds were found at rivers apart from their natal rivers. Birds bred when as young as 2-years-old. The furthest sighting was at Firth of Thames, 736 km NE of the banding site; the southernmost was at Waipahi, Otago, 412 km SW of the banding site; and the oldest recovery was 22.1 years after banding. Band loss likely affected recovery rates, as the oldest bird found with an aluminium band was only 10.9 years-old.

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INTRODUCTION

In the late 1950s through 1970s, Ken Rowe (my late father) held a general banding permit that allowed him to band most species apart from game birds. Banding was carried out at home, on rivers, coasts and on offshore islands. The aim of his programme was simple: band anything that could be caught, see what resulted, and make the data available for anyone who wished to use it. The best example was banding red-billed gulls (*Chroicocephalus novaehollandiae scopulinus*) at Kaikōura from 1959 to 1964, which progressed into a study being continued by Jim Mills through to the present day (e.g. Mills *et al.* 2018). I took over Ken Rowe's banding permit in later years, until the days of "band and fling" were over, and more focussed banding programmes were required. This paper is the last in a series in which information, mainly recovery and

dispersal data, is presented from that banding programme in order to have it in the public domain. Previous papers in the series included three that reported similar information for black-backed gull (*Larus dominicanus*), red-billed gull, and white-fronted tern (*Sterna striata*) (see Rowe 2013, 2024a & b), which allow comparisons with black-billed gull band recoveries.

This paper presents data from band recoveries of the endemic black-billed gull (tarāpuka, *Chroicocephalus bulleri*) on North Canterbury rivers, mainly the Ashley River. Black-billed gulls are widely found in inland areas of New Zealand and are classified as "Near threatened" by BirdLife International (2024) and as "At risk: declining" under the New Zealand Threat Classification system (Robertson *et al.* 2021). Black-billed gulls have been banded in New Zealand from about 1950 (Cunningham 1951a). E.W. Dawson appears to have banded the first black-billed gulls on the Ashley River, 304 in 1950–1951 (Cunningham 1951b; Dawson 1954). W.C. Clark and E.G. Turbott began banding

Table 1. Locations of northern South Island black-billed gull colonies where chicks were banded, 1958 to 1974 and 1983.

Locality	Coordinates
Kowhai River – Kaikōura	42.415°S 173.631°E
Conway River	42.608°S 173.311°E – 42.616°S 173.467°E
Waiau River – opposite Gabriel’s Gully	42.568°S 172.723°E
Waipara River – mouth	43.154°S 172.795°E
Ashley River – below gorge	43.232°S 172.235°E – 42.275°S 172.725°E
Ashley River – Ōkūkū River	43.154°S 172.404°E – 43.263°S 172.469°E
Ashley River – Lees Valley	43.143°S 172.213°E
Waimakariri River - gorge	43.360°S 172.054°E

black-billed gulls on the Ashley River in 1957-1958 (Kinsky 1958) and Ken Rowe in 1958-59. This paper provides longevity and dispersal data to supplement that collated in Higgins & Davies (1996) and McClellan & Habraken (2013).

METHODS

Black-billed gulls were banded on the braided, gravel-bed rivers listed in Table 1 from 1958 until 1974, and in 1983. Colonies outside the Ashley River system were found while travelling to Kaikōura to band red-billed gull chicks (Conway and Kowhai Rivers) or incidental to other activities. Those on the Ashley River, the closest to the author’s home, were found whilst searching the river; multiple visits were made to most colonies to band the chicks. Chicks were captured by hand when still in their nests or nearby before they could fly. Aluminium size E butt bands were used from 1958 to 1967, harder-wearing monel bands were introduced in 1968, and stainless steel bands from 1972.

Ken Rowe’s notebooks were not kept, and so banding and re-sighting/recovery data came from files held by the author or from Department of Conservation (DOC) Banding Office archives. Where locations of sightings were known to the author from Banding Office recovery slips, the distances from the banding sites were measured using Google Earth Pro™. For other records, the distances and directions calculated by the Banding Office record system were used. In the 1960s-70s, at least, many locations such as the Ashley/ Ōkūkū Rivers confluence, 43°16’E 172°28’S, were rounded down to 10’ and coded as 431E 1722S

(= 43.167°E 172.3335°) creating a potential error up to ± 23 km. Directions were given to ± 11.25° of arc, i.e. as SSW, which equates to about ± 20 km at 100 km distance.

Ages refer to the time difference between banding and reporting, not the hatching date. This time period will have a variable, inherent error and will underestimate age as chicks were banded from a few days after hatching when they were big enough for the band to stay on, through to almost flying. Studies quoted in Higgins & Davies (1996) give fledging between 20 and 24 days, while McClellan & Habraken (2013) give minimum fledging at 26 days.

RESULTS

A total of 15,734 black-billed gulls were banded (Table 2), including 13,102 on the Ashley River and its main tributary, the Ōkūkū River; 2,632 were banded on other rivers, mainly the Conway River. Non-flying chicks accounted for 15,694 of these banded birds, and 35 of the 40 adult birds were rebanded with stainless steel bands as the aluminium bands became worn. No banding was attempted from 1975 to 1982. On the Ashley River system, gull colonies were located anywhere between Lees Valley and the sea, and on the Ōkūkū River. While Table 2 shows nil bandings for 1968 and 1969, we did visit the Ashley River in these years as banded dotterels (*Anarhynchus bicinctus*) were banded in 1969 and black-backed gulls in 1968 (LKR *unpubl. data*). It is unlikely that we missed any colonies in these years, and any that were present must have failed as we did not find chicks to band; there are no paper records kept to confirm this.

Table 2. Numbers of black-billed gull chicks banded at North Canterbury colonies 1958 to 1974 and 1983. Each line represents one colony in the given year.

Locality	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1983
Kowhai River - Kaikoura		120																
Conway River			196	249	4	1,358		29						137				
								3										
Waiau R																		77
Waipara River - mouth									309									
Waimakariri River						150												
Ashley River system																		
Gorge to the sea	187	181	1,003	131	345	529	242	1,538	242	284			1,412	14	1,439	186		316
	119			32	155	385		294		198								
					117	268												
					29													
Ōkūkū River					1,587													
					506													
Lees Valley					6													
Total Ashley River	306	181	1,003	169	2,739	1,182	242	1,832	242	482			1,412	14	1,439	186		316

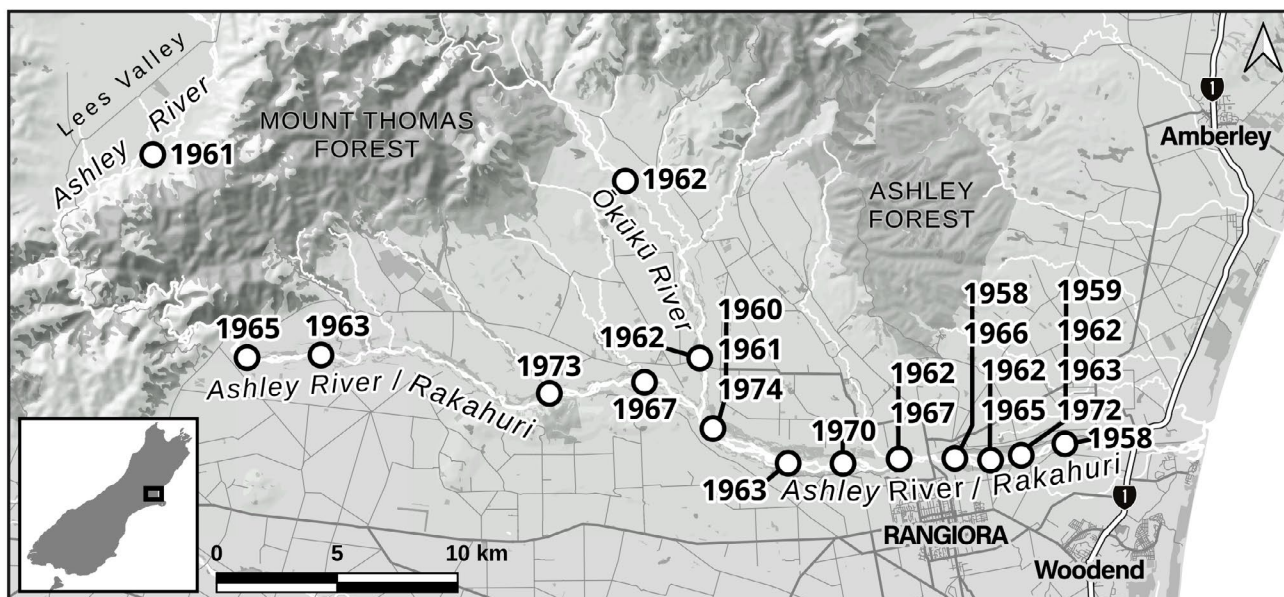


Figure 1. Ashley River showing locations of black-billed gull colonies between 1958 and 1974. Map created in QGIS, with data from the LINZ Data Service and OpenStreetMap Contributors, under CC BY 4.0 and ODbL respectively.

There was a large range in colony sizes – apart from 1968 and 1969 (when no chicks were banded), bandings at an individual colony ranged from 14 to 1,587. Bandings over 1,000 at a colony were: Ōkūkū River 1,587 (1962), and Ashley River 8 km upstream from the sea 1,538 (1965), 7.2 km upstream 1,439 (1972), 15.3 km upstream 1,412 (1970), 20 km upstream 1,357 (1974), opposite the Ōkūkū River 1,003 (1960). When the number of chicks banded each year from 1958 to 1974 were plotted as an X-Y graph, there was no trend with time (Olmstead and Tukey's corner test for association $S = 7 < S_{p=0.05} = 11$; Sokal & Rohlf 1981). Outside of the Ashley River, the largest banding operation was 1,358 chicks banded on the Conway River in 1963.

Post-banding records of black-billed gulls from the Ashley River (including the Ōkūkū River) totalled 1,670, with an additional 84 for birds banded on the other five rivers. The majority were sight records, at least 1,137. Of these, 992 sightings were made by J.R. (Dick) Jackson, mainly in Christchurch and its environs, but as far north as the Conway River, as far south as the Ashburton River, and inland up to the confluence of the Waimakariri and Hawdon Rivers.

Recoveries by banding location

1. Ashley River

More than one colony was found on the Ashley River system in any given season six times. The largest number of colonies was six in 1962 of which two were on the Ōkūkū River (Table 2). The Ashley River has a small, braided section in Lees Valley, about 65 km upstream from the sea and 23 km above Ashley Gorge. A small colony was found there in 1961 and six chicks were banded; one was sighted at Ashley Gorge two years later. The Ōkūkū River is the main tributary of the Ashley River joining about 22 km from the sea. There is a braided section about 13 km long where, in 1962, two colonies were found, OB at the road bridge 2 km upstream from the Ashley River and OH a further 8 km upstream at Hillside; 506 and 1,587 chicks were banded at OB and OH, respectively. On the main Ashley River, colonies were found from near the sea to below the Ashley Gorge, a stretch of 40 km; 11,003 birds were banded at 25 colonies between 1958 and 1983, (Table 2, Fig. 1).

From the 1,670 post-banding records of Ashley River birds, the furthest north a bird was found was the

Firth of Thames, 736 km NE of the banding colony, and the southernmost was at Waipahi, South Otago, 412 km SW of the banding site (Table 3). Thirteen other birds were found at distances greater than 200 km from their natal Ashley River colonies – six in the North Island, seven around Blenheim and Nelson, and none in the lower South Island or West Coast (Tables 3 & 4). Five of the 17 birds found 101–200 km distant were at the Ashburton River, with the remainder spread between Kaikōura and the Conway River. Two birds seen 85 km from the coast at the confluence of the Waimakariri/Hawdon Rivers were the furthest recorded inland. The other 55 birds found 51–100 km distant were as far south as Ashburton and as far north as the Waiau River near Hanmer. The 1,440 records within 50 km of the banding sites (86% of the total) included 955 sight records by J.R. Jackson and 51 by unnamed observers, and 101 dead chicks at the colonies; these birds were found between Lake Ellesmere and Christchurch to the south to 10 km north of the Ashley River.

Juveniles departed the breeding colonies shortly after fledging, as shown by E25115 found dead 6 km from the Ōkūkū River colony only 14 days after banding; other birds were seen at Christchurch, 28–40 km from their colonies, 17 (E359), 20 (E24703), and 27 (E46356) days after banding. Other examples of quick dispersal were birds seen at Culverden (58 km NE) after 42 days (E24707), Tinwald (82 km SW) after 61 days (E19033), Motueka (247 km N) after 69 days (E95979 dead), and Levin (370 km NE) after 106 days (E45326 dead). Birds banded as chicks on the Ashley River were sighted on most rivers in the region (Table 5), with breeding confirmed at Kaikōura Peninsula, the Waiau River, the Waimakariri River at its confluence with the Hawdon River and in its lower reaches, and the Rakaia River.

The oldest recovery among the Ashley River birds, E80308 banded in 1970, was found dead aged 22.1 years at Amberley Beach, 23 km ENE of where it was banded (Table 6). The second oldest recovery, E95695 was found dead near Christchurch aged 18.2 years, and the oldest live bird (E100401) was seen at the Waiau River upstream of the Hanmer turnoff at age 16.0 years. Both bands (which were monel and stainless steel respectively) were noted as very worn.

Table 3. Records of black-billed gulls banded in North Canterbury, 1958–1974 and 1983, found > 200 km from their natal colonies.

Natal river	Sighting locality	Band	Date banded	Date found	Distance (Km)	Age (Years)	Status
Ashley River	Firth of Thames	E37749	7 Dec 1963	13 May 1972	736 NNE	8.4	Shot
Waipara River	Tutaekuri River	E46468	20 Nov 1966	11 Apr 1968	527 NE	1.4	Dead
Ökükü River	Waipahi, Otago	E24669	2 Dec 1962	20 Mar 1963	412 SW	0.3	Dead
Ökükü River	Wairarapa	E12048	11 Nov 1962	4 Oct 1963	408 NE	0.9	Dead
Ashley River	Levin	E45326	27 Nov 1965	12 Mar 1966	370 NE	0.3	Alive
Conway River	Herbertville Beach	E32619	10 Nov 1963	11 Apr 1966	358 NE	2.4	Alive
Conway River	Waitaki River	E3258	27 Nov 1960	11 Jul 1962	312 SW	1.6	Alive
Ashley River	Haitaitai	E25444	9 Nov 1963	17 May 1968	299 NE	4.5	Dead- car
Ashley River	Eastbourne	E76486	13 Nov 1970	10 Oct 1971	297 NE	0.9	Dead
Ashley River	Seatoun	E105355	21 Nov 1974	30 Apr 1988	291 NE	13.4	Alive
Ashley River	Oriental Bay	E7120	10 Dec 1960	2 Jun 1963	290 NE	2.5	Alive
Ashley River	Punga Cove	E100399	8 Nov 1974	23 Apr 1975	275 NNE	0.5	Dead
Kowhai River	Rangitata River	E3361	6 Dec 1959	21 Oct 1970	269 SW	10.9	Alive
Ashley River	Tory Channel	E100683	11 Nov 1974	15 Feb 1976	265 NNE	1.3	Dead
Ashley River	Motueka	E95979	19 Nov 1972	28 Jan 1973	247 N	0.2	Dead
Ashley River	Blenheim	E100340	8 Nov 1974	6 Dec 1979	230 NNE	5.1	Dead
Ashley River	Nelson	E45079	27 Nov 1969	8 Apr 1969	228 NE	3.4	Alive
Ashley River	Blenheim	E7759	10 Dec 1960	6 Dec 1963	227 NNE	3.0	Dead
Ashley River	Blenheim	E81587	11 Dec 1972	10 Mar 1980	220 NNE	7.3	Dead

Table 4 Distances moved by black-billed gulls after banding. Numbers in parentheses are % of birds banded. There were 141 records from the Ashley River with no localities/distances given.

River	Chicks banded	Post-banding records	Individual birds	Post-banding records			
				>200 km	101–200	51–100	0–50
Kowhai	120	10 (8.3)	10 (8.3)	1	6	0	3
Conway	1,976	69	65 (3.3)	2	26	5	36
Waiau	77	1	1 (1.3)	0	1	0	0
Waipara	309	4	4 (1.3)	1	0	0	3
Waimakariri	160	0	0	0	0	0	0
Ashley	13,062	1,670	1,183 (9.1)	15	17	57	1,440
Total	15,694	1,754	1,263 (8.1)	19	50	62	1,482

DOC supplied files contained 79 sightings of 60 breeding birds, all from the Ashley/ Ökükü Rivers system. Other birds were found on colonies in the breeding season, e.g. as given in Table 5, but with no indication of their breeding status. Thirty-four birds were 2-year-olds, of which 30 had eggs or chicks; the oldest was a 16-year-old. Thirty-three birds were breeding on their natal river, 27 more probably were but some could have been on the Waimakariri River, and the balance were at other rivers (Table 7). Birds were seen breeding on the Ashburton River (39813, 111 km SW), the Waiau River (E100401, 80 km NNE), and the confluence of the Waimakariri and Hawdon Rivers (E18595, 65 km WNW) indicating the presence of a colony there. Another bird, (E11848) was listed in DOC files as being seen with chicks 143 km NE of the Ökükü River bridge colony. Because the coordinates of the sighting location (43.330°S, 173.667°E) are rounded down the nearest 10' (0.167°), this places the bird in a block SE of that point which includes the Kaikōura Peninsula red-billed gull colony where black-billed gulls have bred (LKR *pers. obs.*).

2. Conway River

Over six seasons between 1960 and 1971, 1,976 chicks were banded on the Conway River 3–12 km upriver from the coast, with two colonies present in 1965 (Table 2).

The most chicks banded in a season at a colony was in 1963, when 1,358 chicks were banded in 1 day. There were 69 banded birds recorded later, with 31 being on the Conway River or at its mouth. Records away from the colonies were made between Herbertville Beach, East Coast North Island, 358 km NE of the banding sites, and the Waitaki River, 312 km SW (Table 3). One bird found at Blenheim and 25 near Christchurch were over 100 km from the Conway River; 4 of the birds between 50 and 100 km away were also near Christchurch, the other having travelled north. The oldest sighting was E32493 at Christchurch aged 7.4-years-old. Apart from on the Conway River, birds found during the breeding season were near/at colonies on the Ashley, Ökükü, and Waimakariri Rivers with no indication of their breeding status; three 9-month-old birds were found at Ashley Gorge at the start of a breeding season (Table 5). After fledging, birds soon left the colony with one found dead at Kaikōura 35 days after banding and others being sighted in Christchurch 3 months after banding.

3. Waipara River mouth

Black-billed gull chicks were banded near the Waipara River mouth solely in 1966 (309 chicks; Table 2). One of these was recovered nearly 15 months later at the mouth of the Tutaekuri River (527 km NE of the banding site;

Table 5. A selection of black-billed gull sightings at rivers other than natal rivers during the breeding season (Sep–Dec). Movements between the Ōkūkū and Ashley Rivers are not included as the Ōkūkū River is a tributary of the Ashley River.

Natal river	Resight river	Band no.	Date banded	Date found	Age (Years)	Breeding status	
Kowhai River	Conway River	E3329	6 Dec 1959	8 Dec 1962	3.0	Unknown	
		E3344	6 Dec 1959	8 Dec 1962	3.0	Unknown	
		E3347	6 Dec 1959	8 Dec 1962	3.0	Unknown	
		E3361	6 Dec 1959	21 Oct 1970	10.9	Unknown	
Conway River	Ashley River	E5115	27 Nov 1961	18 Nov 1962	2.0	Unknown	
		Ashley R–Gorge	E3210	27 Nov 1960	3 Nov 1963	2.9	Unknown
	Ōkūkū River	E11210	26 Nov 1961	5 Sep 1964	2.8	Unknown	
		E25965	10 Nov 1963	5 Sep 1964	0.8	Unknown	
		E25975	10 Nov 1963	5 Sep 1964	0.8	Unknown	
		E32833	10 Nov 1963	5 Sep 1964	0.8	Unknown	
		E3252	29 Nov 1960	4 Nov 1962	1.9	Unknown	
Waimakariri River	E37792	10 Nov 1963	15 Sep 1965	1.9	Unknown		
Waipara River	Ashley River	E46730	20 Nov 1966	20 Dec 1972	6.1	Dead on colony	
		E46739	20 Nov 1966	11 Nov 1970	4.0	Unknown	
Ashley/ Ōkūkū River	Kaikōura Peninsula	E11848	11 Nov 1962	12 Dec 1965	3.1	With chick	
		E100401	11 Nov 1974	5 Nov 1990	16.0	Breeding	
		E24483	2 Dec 1962	14 Nov 1964	2.0	Unknown	
		Waimakariri River	38062	5 Dec 1958	6 Dec 1962	4.0	1 egg
			E7130	10 Dec 1960	24 Nov 1963	3.0	Unknown
			E7177	10 Dec 1960	11 Dec 1962	2.0	Unknown
			E7228	10 Dec 1960	2 Nov 1963	2.9	Unknown
		Rakaia River	E7741	10 Dec 1960	7 Dec 1963	3.0	Breeding
			E7775	10 Dec 1960	24 Nov 1963	3.0	Breeding
			E7805	10 Dec 1960	2 Nov 1963	2.9	Breeding
	E7909		18 Dec 1960	20 Dec 1962	2.0	>1 egg	
	E7997		18 Dec 1960	2 Nov 1963	2.9	Breeding	
	E8004		10 Dec 1960	18 Dec 1962	2.0	1 egg	
	E8064		10 Dec 1960	3 Nov 1963	2.9	Unknown	
	E8075		10 Dec 1960	23 Nov 1963	3.0	Breeding	
	E8078		10 Dec 1960	11 Dec 1962	2.0	Not Breeding	
	E76566		13 Nov 1970	10 Dec 1982	12.1	>1 egg	
	Ashburton River	E80872	16 Nov 1972	10 Dec 1982	10.1	>1 egg	
		E100246	8 Nov 1974	10 Dec 1982	8.1	>1 egg	
		E100421	11 Nov 1974	10 Dec 1982	8.1	1 egg	
E100477		11 Nov 1974	10 Dec 1982	8.1	>1 egg		
E100630		13 Nov 1974	10 Dec 1982	8.1	>1 egg		
E105109		15 Nov 1974	10 Dec 1982	8.1	>1 egg		
39813		12 Dec 1958	2 Dec 1962	4.0	>1 egg		
39824		12 Dec 1958	2 Dec 1962	4.0	Unknown		
E7562	10 Dec 1960	2 Dec 1962	2.0	Not breeding			

Table 6. Oldest sightings of black-billed gulls banded at the Ashley River.

Natal river	Resighting location	Band	Date banded	Date found	Age (Years)	Status
Ashley River	Amberley Beach	E80308	22 Nov 1970	6 Jan 1993	22.1	Recently dead
Ashley River	Christchurch–Templeton	E100973	13 Nov 1974	15 Oct 1995	20.9	Farm–band only in soil
Ashley River	Christchurch–New Brighton beach	E95695	19 Nov 1972	12 Jan 1991	18.2	Shot
Ashley River	Waiau River upstream of Hanmer turnoff	E100401	11 Nov 1974	5 Nov 1990	16.0	Sight
Ashley River	Central Christchurch	E81427	5 Dec 1972	1 May 1988	15.4	Sight
Ashley River	Central Christchurch	E81087	3 Nov 1972	24 Apr 1988	15.4	Sight
Ashley River	Waikuku Beach	E100934	13 Nov 1972	26 Jan 1990	15.2	Dead

Table 7. Sightings of breeding black-billed gulls banded on the Ashley and Ōkūkū Rivers and found breeding elsewhere, with breeding locality and age.

Breeding Status	Total	Breeding locality								Age (Years)							
		Uncertain river	Ashley/ Ōkūkū Rivers	Kaikōura Peninsula	Waiiau River	Waimakariri River	Hawdon River	Rakaia River	Ashburton River	2	3	4	8	10	12	16	
Breeding - no detail	32	21	5		1	5				3	27	1				1	
With mate	3	1	2							3							
With 1 egg	16	1	12			2		1		10		5	1				
With > 1 egg	23	4	10			1	1	6		1	14	2	4	2	1		
With 1 chick	3		2	1						2	1						
With > 1 chick	2		2							2							
Total	79	27	33	1	1	8	1	7		1	34	28	8	5	2	1	1

Table 3). Another two were seen at Ashley River colonies, about 20 km SW, during breeding seasons, but with no record of their breeding status (Table 5).

4. Waimakariri River

During 1962, 150 chicks were banded on the Waimakariri River (Table 2); none was sighted subsequently.

5. Kōwhai River near Kaikōura

During 1959–1960, 120 chicks were banded near the SH1 road bridge, 0.4 km from the sea (Table 2); 10 of these chicks were subsequently recorded away from the Kowhai River. The only bird found over 200 km away from the colony was E3361 269 km SW, probably near the Rangitata River mouth given it was caught in a fishing line and this site was in the rectangle based on coordinates in the database (Tables 3 & 4). Six birds were found 101–200 km away (Table 4), five at Christchurch to the south and one at the Wairau River to the north. Three 3-year-old birds were sighted at the Conway River (Table 5). The oldest sighting was E3361 seen at the Rangitata River at almost 11-years-old.

6. Waiiau River

Seventy-seven chicks were banded in 1973 opposite Gabriels Gully on SH7, 5 km above the Hammer Springs turnoff and 62 km from the sea (Table 2). A bird found at Wakanui Beach, 177 km SSW of the banding site, 7 months after banding was the only subsequent record.

DISCUSSION

Site fidelity of black-billed gull colonies was low, with colonies found in different locations on a river from year to year. For example, in the Conway River, colonies were found 3 km from the sea, at Glen Colwyn 10 km upstream, and at Ferniehurst 15 km upstream. Only two colonies were found in the Ōkūkū River, both in 1962. In other years, these birds probably nested in the Ashley River where 1–4 colonies were found in any one year from Ashley Gorge down to 5 km from the sea, a distance of 35 km, and in Lees Valley (Fig. 1). Colony locations changed from year to year, probably due to changing habitat conditions as a result of flooding or weed encroachment (Beer 1966; McClellan 2009; McClellan & Habraken 2013).

Treating the numbers of chicks banded as a surrogate for colony population size, there was a large variation in the numbers of chicks produced. Four studies listed in Higgins & Davies (1996) plus that of McClellan (2009) had an average clutch size of 2.0 eggs. Assuming this average applied to the Ashley River, all eggs hatched and all chicks were banded, the six largest colonies would have been in the region of 500–800 nests (average about 700 nests),

and the others between about 10 and 260 nests (average about 110 nests); the average for all colonies was about 230 nests. These ballpark figures will be underestimates to an unknown degree as some eggs would not have hatched, some chicks died before banding, and we did not band all chicks despite attempting to do so. The average Ashley River colony size, 230 nests, is 23% more than the average size from 5 censuses from 1995–96 to 2016–17 of Ashley River. However, Ashley River colonies were much smaller than the average size of all Canterbury colonies: 768 nests/colony (calculated from Tables 2 & 5 in Mischler 2018), and the super colony of about 7,500 nests on the Ashburton River in 2017 (Bell & Harborne 2019). Other super colonies have been noted on the Ashburton River in 2014 and the lower Rangitata River in 2015, each over 10,000 birds (McClellan & Habraken 2013), and in Southland where, for example, the Eyre Creek and Whitestone colonies were over 5000 birds in 2006 (McClellan 2009). No trend was detected in the numbers of chicks banded over time in the period 1958–1974 in the Ashley River, probably because of the large annual fluctuations shown in Table 2.

Sightings of Ashley River juveniles revealed that they leave their natal colony soon after fledging, with one seen off-colony only 14 days after banding as a chick, and others less than one month after. This fits the pattern of black-billed gulls rapidly abandoning the colony after breeding finishes (Higgins & Davies 1996; McClellan & Habraken 2013). Previous examples of black-billed gulls dispersing rapidly after fledging included one found dead at Waikuku Beach 27 km away 37 days after banding (Kinsky 1957), one found at Pelorus Sound 54 days after it was banded on the Wairau River 64 km away, one found at Island Cliff 69 days and 240 km from the Aparima River, and one that moved from Oreti River to Christchurch (450 km) within 85 days (Kinsky 1963).

Sightings of birds banded in this study revealed that individuals bred at colonies up to 135 km from where they fledged. The furthest of these was one that nested next to a red-billed gull colony at Kaikōura Peninsula, 135 km away from the banding site. The longest river to river movements were from the Ashley River system to the Ashburton River (110 km SSW) and the Hawdon River mouth (65 km WNW). This may not be unusual as a bird from the Ashley River was previously reported at the Waipara River (Dawson 1954) and McClellan (2009) reported extensive movements of black-billed gulls between rivers in Southland. Similarly, red-billed gulls have been shown to disperse and breed away from their natal colonies (Mills 1970; Rowe 2024b).

Black-billed gulls can start breeding in their second year (Heather & Robertson 2005; McClellan & Habraken 2013), though this is based on very few records. A bird banded on the Ashley River was found nesting at the Waipara River as

a 2-year-old (Bull 1953; Dawson 1954) as were other 2-year-olds at the natal colony (Dawson 1954). McClellan (2009) found 2-year-olds breeding in her Southland study. This study provides additional support for these findings, with 34 records of 2-year-old gulls found breeding at natal and non-natal rivers.

The furthest distance a bird from this study was found away from its natal colony was 736 km that E37749 travelled from the Ashley River to the Firth of Thames, a distance 31% more than the maximum dispersal of 560 km given in McClellan & Habraken (2013); the second furthest was E46468 from the Waipara River to the Tutaekuri River (527 km). These distances are comparable to those travelled by Southland birds to Ngakutu Bay near Picton, about 700 km, and Goose Bay near Kaikoura, about 570 km (McClellan 2009). Other long distance recoveries included 480 km from Aparima River north to Christchurch, 470 km from Ashley River to Wellington, and 450 km from Oreti River to Christchurch (Kinsky 1961, 1962). The longest distances travelled by black-billed gulls banded in North Canterbury cover a similar range to that reported for red-billed gulls banded at Kaikōura Peninsula, about Auckland in the north to Stewart Island in the south (Rowe 2024b).

The oldest of the banded chicks found was a dead bird aged 22.1 years-old, which is less than the maximum longevity of 27.3 years given by McClellan & Habraken (2013) and the maximum of 28.2 years for a red-billed gull at Kaikōura (Rowe 2024b). Age records in this study have to be qualified by the band types used, which were mainly less durable aluminium. Mills (1972) has shown that for red-billed gulls losses occurred after 4 years for butt-to-butt aluminium bands, which limited reliable re-sighting duration estimates unless birds were rebanded with stainless steel band; losses of aluminium H bands occurred after 6 years. Black-billed gulls in Southland have been shown to lose metal bands at ages between 7 and 9 years (McClellan 2009). The oldest recovery of an aluminium banded bird in this study was 10.9 years, which suggests that band loss may have occurred. Only seven birds of the 15,734 banded in this study were recovered over 15-years-old, the oldest (at 22.1 years) had a monel band that was reported as very worn, as was the oldest stainless steel band recovered (on a bird shot aged 18.2 years).

In summary, black-billed gulls colonies in North Canterbury rivers move up and down stream from season to season, individuals have been shown to move distances up to 736 km, and to live up to 22 years. They have bred at 2-years-old and many have been found at sites other than their natal rivers. McClellan (2009) postulated that dispersal by Southland black-billed gulls meant they could constitute a single intermixing population, and movements by black-billed gulls banded in Canterbury support this.

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