

Lower Ashburton Riverbird Monitoring 2016/17 – Summary Report

The Ashburton River/Hakatere is considered to be one of the most important braided rivers in Canterbury for birdlife, supporting important populations of Tarāpuka (black-billed gulls) and Black-fronted terns (BFT). To inform the ongoing management actions on the river for the conservation of these species, Environment Canterbury monitored these river birds during the 2016/17 breeding season.

Keystone Ecology consultants were engaged under contract to monitor the size and productivity of the main Tarāpuka gull colonies and a subset of up to 40 BFT on the lower Ashburton/Hakatere river (below the State Highway 1 (SH1)). Monitoring involved regular checks of four Tarāpuka colony sites and BFT nests from November to mid-January to record bird activity and attain a fledging success rate for each colony and species. Observations of disturbance were also recorded. Cameras were set up overlooking the two main Tarāpuka colonies for the duration of the incubation and nesting periods to provide a means to capture general disturbances or review any major disturbance events reported (see Appendix 1a for methodology).

Tarāpuka fledging success

Tarāpuka counts indicated approximately 5,000 birds inhabited the river during the 2016/17 breeding season. The four main colonies monitored were located at: (1) the lower river mouth; (2) the beach bar (adjacent to a White-fronted tern colony); (3) at a site c.200m upstream of the river mouth on the true left and; (4) located c.300m downstream of the SH1 Bridge (Appendix 1). These colonies had fledging success rates of 22%, 49%, 25% and 60% respectively (average 39%); collectively fledging just over 1400 birds (Table 1).

Table 1: Tarāpuka colony fledging success during the 2016/17 breeding season

Colony	Nests on 04.12.2016	Fledglings* on 12.01.2017	Nests on 12.01.2017	Fledglings on 02.02.17	Fledging %
River mouth	1,761	394			22%
Beach	498	244			49%
Upstream river mouth			488	120	25%
Bridge	1,133	678			60%
Total fledgling count	1,436		Average fledglings across colonies:		39%

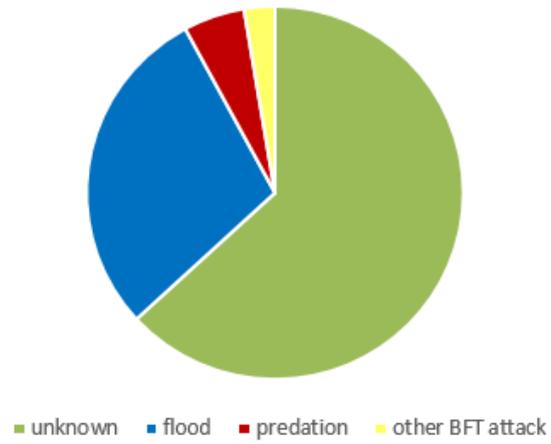
*Fledging count date was chosen when there were an estimated 10% chicks still to fledge while the majority were at fledging (a later date would have missed the main count).

Black-fronted tern fledging success

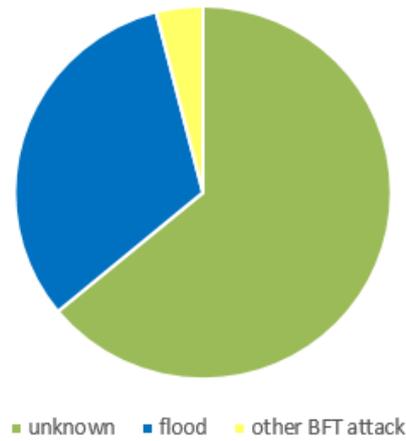
Thirty-eight Black-fronted tern nests were monitored at the river mouth area (see Appendix 2 map). All nests had eggs and 25 (66%) hatched chicks. However, no nests successfully fledged birds. For close to 2/3 of these nests the cause of nest failure was unknown (no observed causation) while the majority of the remaining third were affected by high flows (Figure 1).

Few terrestrial predation indications were observed, however it is probable that it is a key issue for the black-fronted terns. Unobserved avian predation by Black-backed gulls or Harrier may also have been occurring, with chicks being taken away from the area before being consumed.

Causation of BFT nest failure for all 38 nests



Causation of BFT chick mortality (n=25)



Causation of BFT nest (egg) failure (n=13)

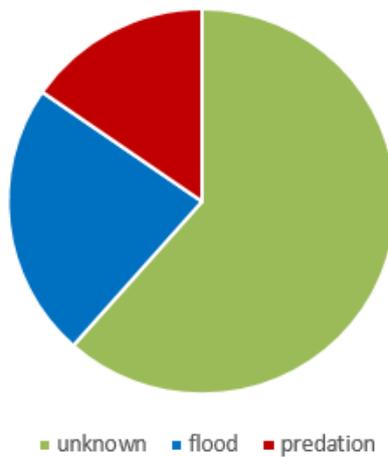


Figure 1: Observed causation of Black-fronted tern nest failures 2016/17. There is a high probability that predation is a major cause of the nest failures for which no causation was directly observed.

Disturbance of river bird colonies

Flooding

Flooding of nesting areas (caused by high flows (see Appendix 3) and large sea swells) were a significant issue for both bird species in terms of nest failure. Weeds appear to have compounded this issue by reducing the available area of suitable (higher) nesting habitat which would be less vulnerable to high flows. This resulted in both gull and tern colonies shifting repeatedly and the birds having to make several nesting attempts, likely reducing the fledging success rates. Additionally, the Tarāpuka may have been made up of young birds, and this may have affected the nesting success rate further than expected given that young birds may be less likely to nest multiple times as might older birds (N. Muggan, *pers. comm.*) The establishment of large, high and clean gravelled islands prior to the nesting season could reduce the impact of high flows upon nests.

Colony counts fluctuated in relation to high flow events (over 40cumecs or with high seas), dropping as birds evacuated flooded nesting and resting areas on the river. Flooding around the 16th of November appeared to displace approximately 2,000 birds to the upstream SH1 Bridge site (Figure 2 & 3) and also to both the beach and upstream river mouth colonies.

Note that counts of the beach and upstream river mouth colonies were only recorded twice and primarily to attain fledging success rates.

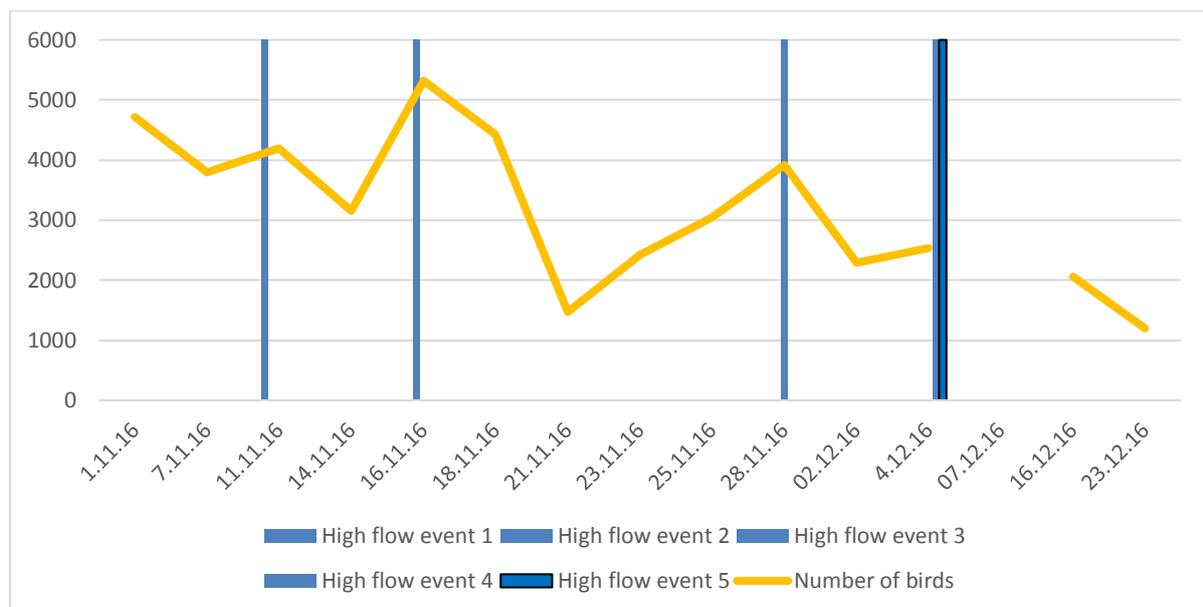


Figure 2: Tarāpuka river mouth colony counts and the five high flow events which were observed to disturb the birds nesting areas.

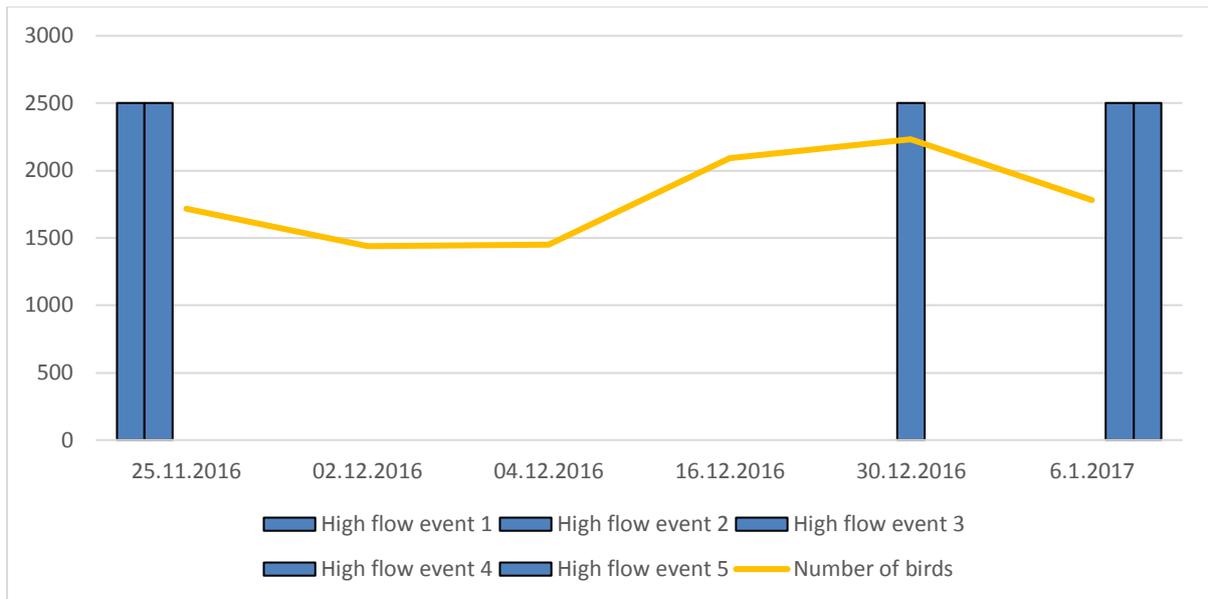


Figure 3: Tarāpuka SH1 Bridge colony counts and high flow events which disturbed colony areas.

Black-backed gulls

Black-backed gulls were counted at the river mouth area during monitoring visits (Figure 4). Numbers increased following some of the flooding disturbances. This may be due to this species also being disturbed by flooding, or this species may have become more active in the area to take advantage of the disturbed, and consequently more vulnerable, Tarāpuka and Black-fronted terns.

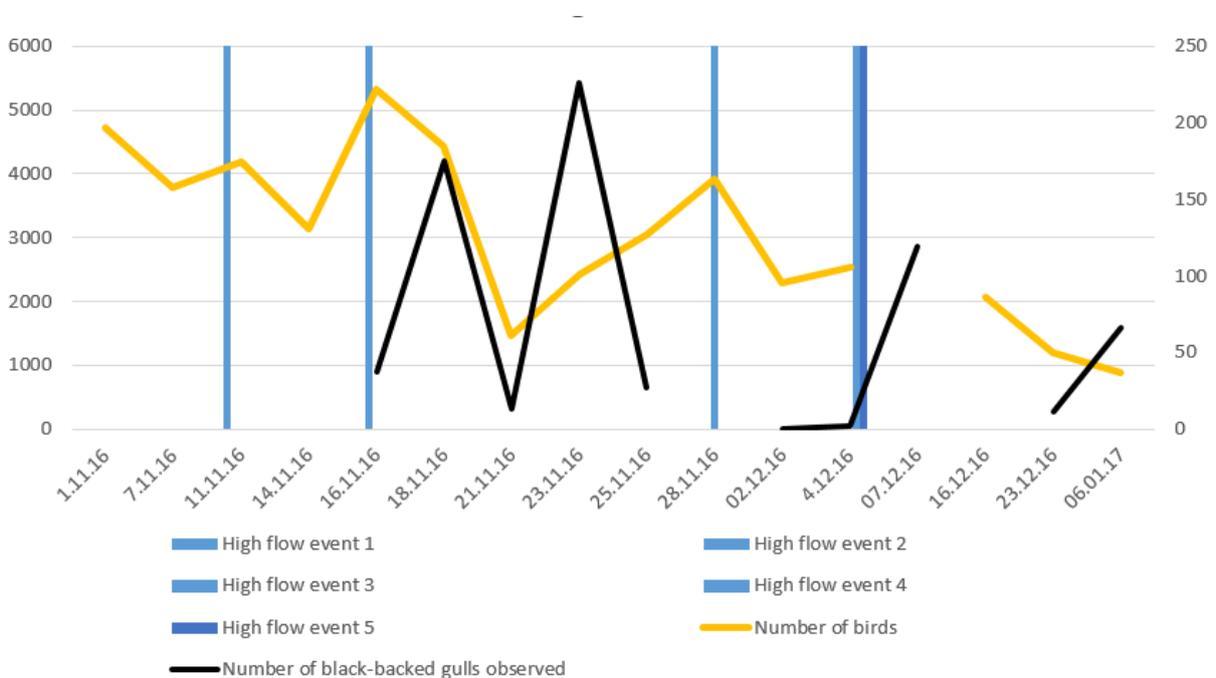


Figure 4: Tarāpuka river mouth colony counts with both high flow events and Southern black-backed gull counts.

Disturbance observations

During most monitoring visits to the river mouth contractors noted observations of bird disturbance. These disturbances primarily consisted of human disturbance (27%), black-backed gulls (13%), harrier hawks (12%) and flooding (10%) with other causes of including helicopters, dogs, vehicles, planes and other birds (Figure 5). Human disturbance events (n=14) included fishermen/white baiters (57%), dog walkers (14%), beach users (21%) and a person undertaking predator trapping (7%).

This provides some indication of the frequency of these types of disturbance, however high frequency will not necessarily mean the disturbance type is of greatest impact upon the birds. For instance several disturbance events caused by harrier hawks may have far less of an impact than a single flood event upon a colony. The observations are limited to those made during daylight hours (mammalian predator disturbance events for instance would occur mostly at night). This information reiterates that disturbance for the gulls and terns is a common occurrence at the river mouth.

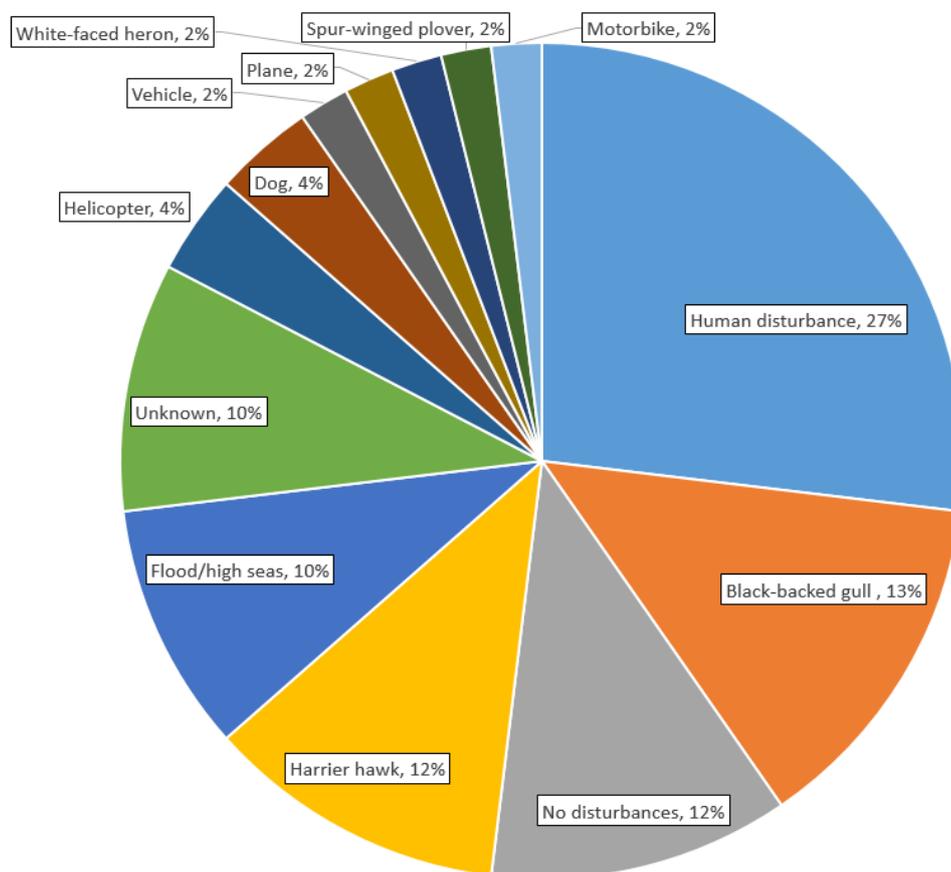


Figure 5: Observations of disturbances of birds at the Lower Ashburton river mouth. Observations were made during the 29 monitoring visits between 28th October 2016 and 6th of January 2017.

Camera footage of the two larger Tarāpuka colonies at the river mouth and SH1 Bridge (see Appendix 4 for camera frame views) provided some further insight into some of these disturbance types. Camera footage revealed aerial predators (likely harrier and black-backed gulls) caused the most significant ‘uplift’ of colonies (majority of colony taking flight in a defensive swarm), while humans appeared to have a less pronounced effect on a colony, particularly if passing through. Footage of a cat confirms these animals are present on the riverbed. Appendix 5 presents camera frames relevant to these general observations.

From observations it appears disturbance of the colonies is both common and diverse. Flooding was the most obvious and clearly detrimental disturbance and cause of nest failures. Island creation or reinforcement of likely nesting habitat could mitigate or avoid this significant threat to fledging success. Beyond flooding it may be that no one type of disturbance is highly detrimental to the birds, but rather that cumulatively their affects are significant. Management actions to reduce any of these disturbances is therefore recommended.

Recommendations for the 2017/18 season

1. Island creation at the SH1 Bridge area – larger, higher and established early (August/September)
2. Weed control across created island and upstream of rivermouth where 'new' colony was observed.
3. Maintain black backed gulls at (current) low numbers
4. Improved and more frequent media releases about the birds in local and regional media
5. More and larger signs put up at nesting areas (checked/maintained every 2-3 days)
6. Some dedicated resource for someone to be present during the nesting season (particularly during high-use times (whitebaiter season/tides & weekends)).
7. If resourced with some person time, then a more robust fence and one that is maintained every 2-3 days
8. Education about cats and discuss live trapping for them
9. Analyse predator trap catch data of the Lower Ashburton to provide further information on the pest assemblage of the area.
10. Consider permanent and extended predator trapping at (likely) colony sites

Additional information

Appendix 6 provides counts of other bird species observed on the river during monitoring visits by contractors.

Appendix 7 provides some general photographs taken by contractors while undertaking monitoring.

APPENDICES

APPENDIX 1A: Methods for black-fronted tern and black-billed gull monitoring October 2016 – January 2017

Surveyors: Niall Muga, Andrew Crossland and Stacey Bryan

Survey locations

At the commencement of the survey the lower Ashburton river, up to Thompsons Track (43°44'12.8"S 171°32'07.0"E), and surrounding land was surveyed to locate any black-billed gull (BBG) and black-fronted tern (BFT) colonies in the area. At this time the only established colonies were at the mouth of the Ashburton river and so the surveys were initially performed in this location. The length of river between the sea and the State Highway One (SH1) bridge was checked an average of once a week to look for any newly established colonies. When newly established colonies were located they were added to the monitoring programme. The final locations of colonies are described in Table 1.

Table 1: The names and locations of black-fronted tern (BFT) and black-billed gull (BBG) colonies surveyed from October 2016 to January 2017.

Species	Colony name	Colony location
BFT	Original colony	44°03'04.4"S 171°48'16.4"E
BFT	Beach colony	44°03'04.1"S 171°48'31.7"E
BFT	River colony	
BBG	Original colony	44°03'05.5"S 171°48'13.4"E
BBG	WFT colony	44°03'12.4"S 171°48'11.3"E
BBG	Bridge colony	43°54'53.2"S 171°44'30.3"E
BBG	New colony	

BFT monitoring

It was aimed to monitor 30 BFT nests over the course of the survey. Only 15 nests were located on the first day of observations and so nests were added to the monitoring programme as they were created or were located throughout the season. Given the high rate of nest failure, new nests were continually being built throughout the study and 27 were added to the original 15, bringing the total to 42 nests monitored. The success of the BFT nests were judged on hatching success (if live chicks were recorded in the nest) and fledging success (whether the chicks were observed at fledging age or not). Evidence of egg predation included the following: shell fragments, yolk spillage or blood stains found in the nest; ants or flies in the nest material; predated adult remains; mammalian tracks near the nest site; and an empty nest when the number of days since laying is insufficient for the egg to have hatched. Once the chicks were confirmed to have hatched, if the surveyors consistently could not locate the chicks, and there had been insufficient time passed for the chick to have fledged, then the latter was presumed deceased.

The first 22 BFT nests were located in the original colony area and were difficult to find using land marks. They were therefore marked with numbered stones placed one to two metres away from their nests, usually on the seaward side. These markers enabled the surveyors to easily locate the

nests and did not have any observable effect of the birds' behaviour. All other nests were identified and located using nearby features of the landscape such as bodies of water or driftwood etc.

The status of each BFT nest was recorded three times a week, in addition to any relevant information on environmental conditions, disturbances and other bird species present. Two of these three times the surveyor remained on the hill top and made conclusions on the nest status based on the birds' behaviour. Once a week A.C. performed a ground-check of all nests to confirm the observations made from the hill top. Given that most bird nests could be easily viewed from the hill top, it was deemed unnecessary and potentially detrimental to disrupt the colonies by doing a ground check more than once a week.

BBG monitoring

BBG colonies were also surveyed three times a week. Either a nest count or a bird count was taken on site at the time of the survey. Photographs were also taken of all the birds, which were then used to gain a more accurate count of the individuals present within the colony.

The majority of BBG colonies had fledging juveniles on January 12th 2017 and so the colony success was judged on how many fledglings were observed compared to the number of nests recorded in the same area approximately a month beforehand (Dec 4th 2016). A maximum population count of BBGs was calculated by doubling the maximum number of birds observed. This was to account for the fact that usually only one bird from each pair is present at the nest at any one time. This number was unsurprisingly early in the season as young birds often do not attempt to re-nest if their first nest fails.

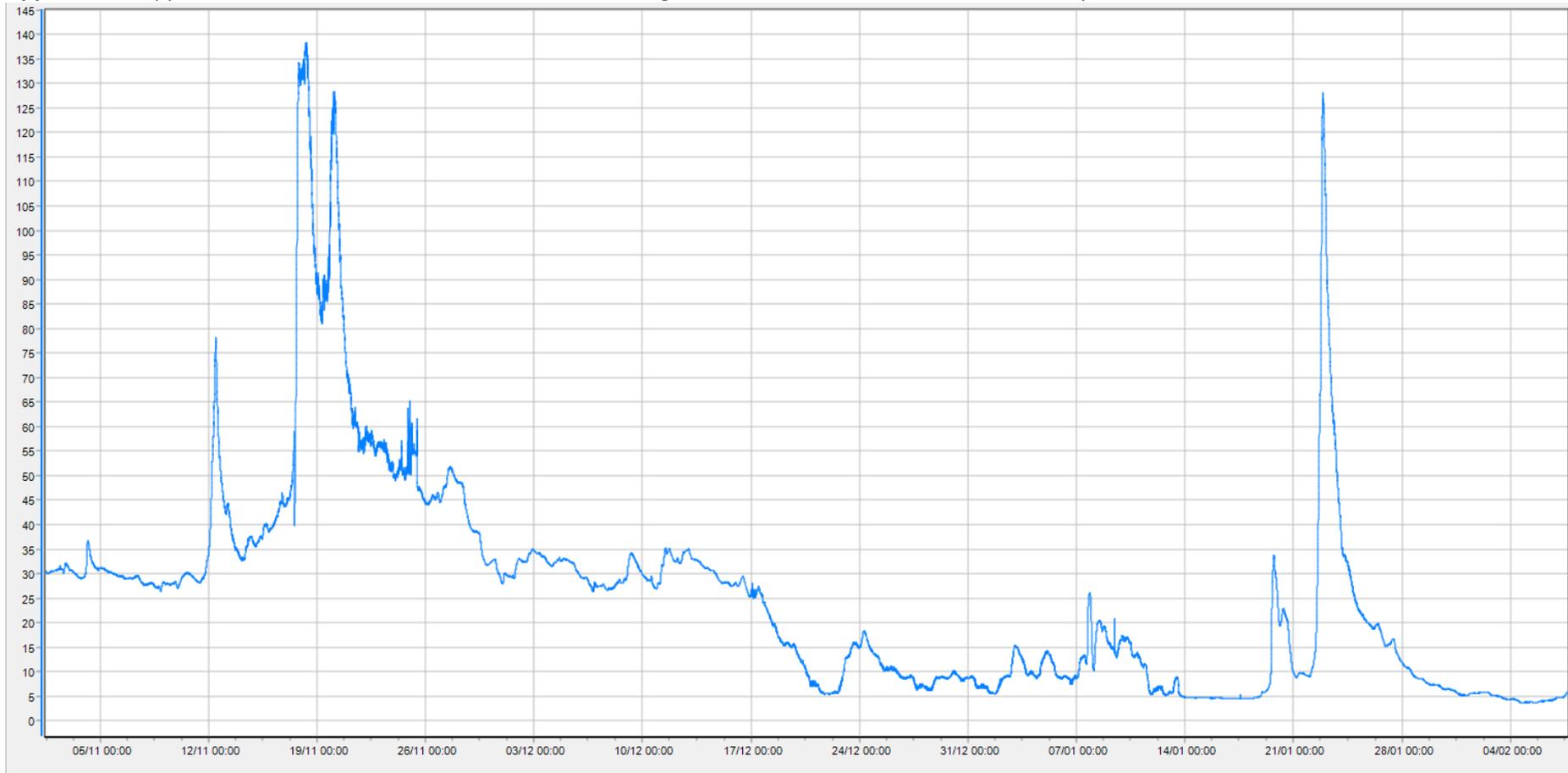
Appendix 1: Locations of the four monitored Tarāpuka colonies 2016/17



Appendix 2: Location of Black-fronted tern monitored nest area (red fill) 2016/17.



Appendix 3. Appendix River flow records for Ashburton SH1 Bridge from 1st November 2016 to 7th February 2017.



Flows over 40 cumecs appear to have caused nest inundation of BFT (observed flooding of nests occurred on 12th & 16th November, 28th December, 3rd and 5th of January). The flood observations of the 3rd and 5th of January while only reading as river flow maximums of 15 cumecs were exacerbated at the river mouth by high sea surges causing nest flooding.

Peaks: 12.11.16 to 14.11.16 (77cumecs); 16.11.16 to 27.12.16 (peaked twice at 137 cumecs and 127 cumecs, smaller peaks at 65 and 50 cumecs)); then stayed under 40 cumecs until 23.1.17 to 25.1.17 (127 cumecs).

Appendix 4: Camera view overlooking the river mouth Tarāpuka colony (above image) and camera view overlooking the SH1 Tarāpuka colony (below image).



Appendix 5: General camera footage observations from sites overlooking the river mouth and SH1 Tarāpuka colony sites

1. Camera footage at SH1 Tarāpuka colony showing Harrier-disturbance (above) and soon after human (monitoring contractor) disturbance – which appears to barely disturb the colony.



2. Camera frame at SH1 colony showing a cat moving along the river bed margin in the early evening



3. Camera footage of river mouth colony – a fisherman present for 1.5 hours (8pm to 9.30pm) and causing some disturbance.



4. Camera frame from river mouth showing human disturbance in the early morning – the person moves through in under 2 minutes and skirts the birds causing partial lift of the colony and for less than a minute.



Appendix 6. Other bird species observed at the Lower Ashburton river mouth during monitoring visits

Date	Observer	Species	Pairs	Adults	Chicks
4.11.16	Niall	Banded dotterels	3		
		Pied stilts	2		
		South Island oyster catchers	1		
		Mallard ducks			
7.11.16	Niall	Grey teal	1		
		White-faced heron		1	
11.11.16	Niall	Banded dotterels	1		2
14.11.16	Stacey	Spur-winged plovers	1		1
		Little shag		1	
		Banded dotterel		1	
21.11.16	Niall	Banded dotterel		1	1
		Pied stilt			2
23.11.16	Andrew	Red-billed gulls		22+	
25.11.16	Stacey	Banded dotterel		1	
		Pied stilt		2	1
02.12.16	Stacey	Pied stilt		2	
		Banded dotterel			1
		Canada goose		2	23
04.12.16	Stacey	Banded dotterel		1	
		Pied stilt		2	
12.12.16	Stacey	Banded dotterel		2	
		Pied stilt		1	
06.01.16	Andrew	Arctic skua		2	
		Harrier hawk		2	

White-fronted tern colony counts. Colony located on beach bar gravels at approximately NZTM: Easting: 1504215.50 / Northing: 5121492.15

White-fronted tern counts at river mouth – beach bar.

Date	Observer	Population	Method
04.11.16	Andrew	5560	Photo
11.11.16	Niall	3000	On site
14.11.16	Stacey	2408	On site
16.11.16	Andrew	3340	On site
18.11.16	Niall	450	On site
23.11.16	Andrew	1700	On site
28.11.16	Niall	4000	On site

Appendix 7: Photographs



Above: Black-fronted tern (BFT) chicks. Below: BFT nest with eggs





Above & Below: River mouth high flow water levels





Above & Below: Neglected river bird signage after high flow events





Above: Observed dead BFT chick (lower circle) near to BFT nest with an egg (upper circle).