Waimakariri River Regional Park
Braided River Bird Management

2018-2019 Season

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Introduction

The Waimakariri River Regional Park (WRRP) largely consists of Environment Canterbury (ECan) owned land between the stopbanks from the Waimakariri river mouth to the Gorge Bridge, also including McLeans Island. The WRRP is managed by the ECan Parks and Forests Team, who seek to protect, promote and enhance this natural space through a variety of recreation and biodiversity projects. One of the main biodiversity projects in this space is management of the Braided River Birds during breeding season.

The Waimakariri River is home to some very rare and unique braided river bird species, including the Wrybill/Ngutu parore, Banded Dotterel/Tuturiwhatu, Black and White Fronted Terns/Tarapirohe and Tara, and the Black-billed Gull/Tarapuka. Typically, the Department of Conservation (DOC) is the lead agency for protection of native species in New Zealand, however DOC tend to have limited involvement in the lower Waimakariri River. Our ECan Parks Team has actively engaged in braided river bird management and monitoring in the WRRP for the past ten seasons as the landowner with some resourcing available to assist DOC.

Our main priority for the previous breeding seasons has been centred around management of black-billed gulls (*Chroicocephalus bulleri*) nesting and breeding within the WRRP boundaries. Black-billed gulls are a critically endangered native species that breed in a few dense colonies along the riverbed, as opposed to a lot of the other native species breeding in our river which tend to be more spread out geographically. The lower Waimakariri River is a relatively large space to manage so focussing on black-billed gull colonies allows us to target resourcing at those colonies, which has flow on benefits for other bird species around the periphery of these colonies.

We have also provided some trapping around large known black and white fronted tern colonies in previous seasons as resourcing allowed. However, the past two seasons we have made efforts to increase our monitoring and protection of black fronted terns in particular, with attempts to identify main breeding colonies early in the season, then continue to monitor the progress and success of those colonies. This has been met with mixed success and is something we hope to learn and further build from in future seasons.

Our main methods for assisting black-billed gulls, black fronted terns (and other surrounding birds by association) include:

- Use of a contract ornithologist to monitor and report on the nesting locations and breeding status of the target bird species,
- Mammalian predator trapping next to main breeding colonies (both black-billed gulls and black-fronted terns),
- Placing blocks and other barriers where possible to prevent vehicles accessing bird colonies,
- Putting out information signs near colonies, talking to members of the public, handing out stickers and other forms of public education,
- Control of southern black backed gull (*Larus dominicanus*) numbers in the lower Waimakariri River in partnership with Christchurch International Airport (CIAL),

- Social media promotions to improve awareness of the protected braided river bird species.

Approximately every second year we also host a Technical Advisory Group (TAG) meeting, inviting ecologists, ornithologists and other relevant industry members to give input on how best to proceed with braided river bird management in the lower Waimakariri for the upcoming season. At these meetings we discuss available funding for the season and what our priorities for spending should be, plus any other relevant industry learnings and experiences of those present. We did not host a TAG meeting prior to the 2018-2019 season but will prior to the upcoming 2019-2020 season.

This 2018-2019 season was one of mixed success. While we had a successful season in terms of pest control and some Black-billed gull fledging success, repeated flooding and human interreference in particular, meant the season was not as productive for the birds as we have seen in other seasons. We will discuss the successes and shortfalls of this season at the next TAG meeting to see what learnings and improvements can be made.

2018-2019 Season Summary

The season looked like it was getting off to an early start, with over 200 black-billed gulls plus oyster catchers, banded dotterels and black-fronted terns all gathered and looking like settling near a gravel extraction site upstream from Haul Road/behind Mcleans Island in late August. A colony of over 20 black-fronted terns was also looking like settling in early September near Harrs Road. Our Rangers continued to monitor these birds but as of late September, none were seen to be nesting yet.

In September we finalised our contract for the season with Niall Mugan and assistant Eleanor Gunby of Keystone Ecology. Niall is contracted as a specialist ornithologist to undertake monitoring and reporting of the braided river bird colonies in the lower Waimakariri River and to report information back to the Contract Manager in the Environment Canterbury Parks and Forests team, Courtney Popenhagen. Niall and his representatives also undertake mammalian predator trapping adjacent to the main black-billed gull and black-fronted tern colonies identified during the breeding season.

By late September there were over 500 adult black-billed gull pairs at the site upstream of Haul Road (Image 1 – Appendix 1), although not nesting. By early October this number had swelled to between 800-1000 adult pairs on site and there was evidence of nesting underway. During a visit to the site on the 8th of October, Courtney noted that most of the birds were swarming in the air and appeared agitated as she approached. Once closer, Courtney observed a swamp harrier (*Circus approximans)* sitting in on the ground in the middle of the colony. A short time later, Courtney observed the hawk flying away with an adult black-billed gull in its claws. It is unclear if the gull was alive or not when it was taken.

This colony was directly adjacent to an active gravel extraction site. The extractors attempted to move further upstream from the forming bird colony, but the birds did not seem concerned or disturbed by the machinery working close by. Surrounding this black-billed gull colony was a number of southern black backed gull (SBBG) pairs. Despite efforts to reduce the number of SBBG surrounding this forming black-billed gull colony, individual SBBG were witnessed harassing the black-bills on several occasions.

Upon returning to the Haul Road black-billed gull colony on the 16th of October, most of the 1000 pairs seen previously had abandoned the site with only 5 pairs remaining on nests. By the 23rd of October only one bird was left sitting on a nest and its partner was observed trying to fight off the persistent harassment of a southern black backed gull. The site was completely abandoned a few days later. Although we could assume the desertion of this site was due to predation and harassment, it is hard to say for sure. There was a small fresh through the Waimakariri River a few days earlier (Appendix 2) but this was not enough water to cover the nesting site. This sort of complete desertion is unusual when some of the birds had begun to nest. A subsequent walk through the colony revealed 40 abandoned nests.

The adult black-billed gulls from the Haul Road site remained unaccounted for in the lower Waimakariri until the 26th of October, when a very large colony of over 2000 adults was found to be settling upstream from an area known as The Sanctuary (Image 1 – Appendix 1). Around the same time a colony of 30 black-fronted terns was also found to be nesting near Dixons Bay (Image 2 – Appendix 1). The tern colony had it's first chicks hatching by the end of October and most of the black-bill gulls at the Sanctuary colony were on nests.

Another slightly larger fresh came through the river in early November. The black-billed gull colony remained relatively undisturbed by this event, although some nests on the edges did get wet or washed out. However, a visit to the Dixons Bay colony a short time after this fresh showed less chicks than previously counted. Approximately 200 black-billed gulls had also joined the terns at this site and were looking to nest.

In November a bird survey was completed from the Waimakariri Gorge to the Motorway Bridges. Of note – this survey revealed that there were around 150 black-fronted tern pairs spread out around the wider Dixons Bay area. The survey participants also recorded six white-winged black terns (*Chlidonias leucopterus)* in this area. We have recorded individual or pairs of white-winged black terns in the lower Waimakariri in previous years, but six is the highest number observed in one place to date.

Unfortunately, on the 9th of November a large flood event of around 2000 cumecs came through the Waimakariri River (Appendix 2). This flood was large enough that the water was bank to bank in some places and most colonies that had established were washed out, including those being monitored near The Sanctuary and Dixons Bay. We were unable to locate the large group of black-bills during visits to the river following the flood. However roughly a week later, a group of 1500-2000 birds were identified in the Ashley River/Rakahuri, further north of the Christchurch. We believe these were the birds previously seen in the Waimakariri River, which had now chosen a new site in the Ashley River/Rakahuri to attempt to nest.

Around the 14th of November a new colony of black fronted terns was noted to be forming slightly further downstream from Dixons Bay, closer to Groyne 44 on the north bank of the Waimakariri River. We believed these birds to be some of those displaced from Dixons Bay by the large flood a week earlier. By the end of November around 13 black-fronted terns were incubating eggs at this location.

At the end of November we also noted a group of around 300 black-billed gulls had joined the terns at the Groyne 44 site. We believed these gulls may have returned from the large Ashley River/Rakahuri group, following a small flood there a few days earlier. The Terns were closer to the berm, while the gulls settled in behind them, closer to the river. By the 10th of November a second group of black-billed gulls had settled next to the first group, bringing the total to around 700 black-billed gulls on site at Groyne 44. There were also numerous white-fronted terns in the wider area.

On the 13th of December, Niall recorded nine black-fronted tern chicks at the Groyne 44 colony. He also recorded observations of the black-billed gulls harassing and chasing two black-fronted tern chicks, as well

as a couple of abandoned tern nests where adults had been seen sitting on previous visits. We believe the black-billed gulls were predating the adjacent black-fronted tern nests in this instance.

Around the same time in early December, we were made aware of a colony of black-fronted terns that had settled downstream of the Old Main North Road Bridge in the lower end of the Waimakariri River. This is the second year in a row that we are aware of the terns choosing to nest in this site. Our Rangers set up signage around the periphery of the colony and checked on the site regularly. Unfortunately, evidence of human disturbance at this location was obvious and the numbers of adults on nests declined throughout December and January. No chicks are known to have fledged from this location.

During December Niall reported that the three main large colonies of black-fronted terns he was monitoring were near Courtenay Road, the Groyne 44 site and a smaller colony back down towards Haul Road. Predator trapping efforts were being focussed around the Groyne 44 site, which had the best access, highest number of birds present and black-billed gulls and white fronted terns also present.

On the 17th of December Niall visited the Groyne 44 colony and was extremely disappointed to discover that, of the 6-800 gull pairs evident before the weekend, now only around 200 pairs remained. Closer inspection of the site found that someone had been out over the weekend and shot at least two adult black-billed gulls sitting on nests. Empty .223 rifle cartridges were found nearby. The black-billed gulls had been settled in two groups side by side, with the group closer to the bank having been shot at and disturbed away from this location. The further away group of around 200 black-billed gulls remained.

The black-fronted terns were in the space between the gulls and the river bank, so would have also been in the path of disturbance. Niall noted that, of the nine tern chicks counted previously, four now remained. By the end of December no black-fronted terns were left at this location and no chicks are known to have successfully fledged. However, the 200 or so black-billed gulls and white-fronted terns remained nesting at this location.

Shortly after the disturbance of the Groyne 44 colony in mid-December, another colony of black-billed gulls was found to have formed further upstream near Downs Road (Image 3 – Appendix 1). Presumably these were the birds disturbed from Groyne 44 attempting to nest again (for the third or fourth time this season). As of the 4th of January, there were approximately 680 pairs of adult black-billed gulls present. Niall placed predator traps around this site to help their chances of success. Six white-winged black terns were also observed in this location, plus multiple black and white fronted tern pairs.

A visit to the Groyne 44 colony in on the 11th of January found 196 gulls present on site, with 160 of those estimated to be incubating eggs. However another visit to this site on the 18th of January found that all remaining black-billed gulls had abandoned this site, with 4WD wheel tracks visible right through the middle of where the colony had been. Niall counted 223 nests at this location, but no black-billed gull chicks were fledged. Niall left some predator traps at this location as around 45 pairs of nesting white-fronted terns still remained.

By late January, around 650 adult black-billed gulls remained at the Downs Road site. We observed southern black backed gull adults walking through colony eating eggs and disturbing adults off nests on at least two subsequent visits to the site. The black-billed gulls were attempting to dive-bomb and drive out the intruders but appeared unable to do so. We were unable to remove the southern black backed gulls doing the damage due to the location of this colony (unsuitable for shooting due to public safety).

Despite all of this, a final nest count of the Downs Road colony in mid-February revealed 559 nests, of which 291 chicks are estimated to have successfully fledged. We also spotted the six white-winged black terns at

this location, some of which were in breeding plumage, but we don't know if they produced chicks. We also believe at least 20 chicks to have fledged from the white-fronted terns at Groyne 44.

Summary of Results

Table 1 – Nesting Success Rates

	Final Nest Counts	Fledglings	Success Rate
White-Fronted Terns (G44)	45	20	0.44
Black Billed Gulls (G44)	233	0	0
Black Billed Gulls (Downs Road/G4)	559	291	0.52
Black Fronted Terns (G39)	35	0	0

Table 1 shows the final count of nests from each of the main colonies being monitored this season, the estimated number of chicks successfully fledged from each location, and the success rate for each colony. Success rate estimates the average number of chicks fledged per breeding pair of adults present.

Table 2 - Comparison of Black-billed Gull Chicks Fledged and Success Rates Across Previous Seasons

Season	Recorded Adult Breeding Pairs	Number of Known Chicks Fledged	Success Rate
2018 - 2019	792	291	0.37
2017 - 2018	1029	520	0.51
2016 - 2017	1120	738	0.66
2015 - 2016	804	339	0.42
2014 - 2015	1143	1550	1.1
2013 - 2014	243	121	0.5

Table 2 shows the known number of breeding Black-billed Gull pairs in the lower Waimakariri River and the estimated breeding success of each, compared of the previous six seasons.

Expenditure:

Contract for the Provision of Services to Assist Braided River Bird Breeding in the Waimakariri River Regional Park, 2018-2019 (Keystone Ecology monitoring and trapping contract)

- *Actual Expenditure: $14,137.60*

Regular checks of a trap line (Doc 200 traps and rat bait stations) along the lower end of the North Bank of the Waimakariri River (Appendix 3):

- *Expenditure to date $3,610*

Two additional checks of this trap line are scheduled before the end of the financial year, estimated to cost $600 each:

- *Estimated remaining expenditure $1,200*

Total season expenditure on monitoring and trapping works for braided river bird protection:

- *$18,947.60*

Southern Black-Backed Gull Control

Southern black backed gulls (SBBG) are widespread throughout the lower Waimakariri River and have a negative impact on other threatened and protected native bird species attempting to breed in the same space. Although SBBG are a native bird, they are generally accepted as a pest species that predate the chicks and eggs of other bird species and take up most of the prime breeding habitat, displacing the other threatened species to less favourable habitat. Christchurch International Airport Limited (CIAL) have worked collaboratively with us for several seasons to reduce SBBG numbers, as the birds in the lower Waimakariri also pose a risk of bird strike to CIAL air traffic.

Our main method for reducing SBBG numbers is through targeted alpha-chloralose poisoning of SBBG in main breeding colonies. This work is guided by a Technical Standard to ensure the poisoning in controlled within a certain radius of the targeted colony, and that risk of by kill to other species is absolutely minimised. Alpha-chloralose poisoning is also supported by a combination of shot-gunning and egg smashing throughout the season. Shot gun control is not considered the most efficient control method for SBBG in the Waimakariri River but is used as a supporting control method where alpha-chloralose poisoning would not be appropriate (i.e. it would not meet the requirements of the Technical Standard).

The 2018-2019 season was the third consecutive season where ECan Parks and CIAL have pooled funding, with an ECan Parks representative co-ordinating and overseeing the SBBG control throughout the lower Waimakariri River on behalf of both parties. We believe this is a successful approach that has allowed more efficient targeted control of SBBG. We hope to continue this model and build on our successful relationship with CIAL in future seasons, to the benefit of both parties.

Our control started with a trial shoot on the 13th of September at a roosting site for SBBG adjacent to The Sanctuary. This was an important trial to see if we could control birds outside of the proper nesting season. This colony has been controlled several years previously and the remaining birds are relatively spread-out and have shown bait shyness behavior in the past, so are very difficult to target with alpha-chloralose.

We pre-fed at this location several days prior to the shoot, but the birds were reluctant to eat the bread and often it was left behind. On the day of the shoot we placed bread out from our hiding spot in willow and shrub cover adjacent to the colony before sunrise, then waited until the first birds came close enough to be shot. Once we had the first couple of birds, we were able to set them up as decoys around the bread bait. As we made more decoys the process became easier as other birds were drawn in. Creating movement with the decoy birds seemed to help in attracting more SBBG. In the space of four hours, with one shooter and one assistant, we were able to remove 30 non-nesting SBBG from this location. We consider this a success as we may be able to continue to target pockets of nuisance SBBG outside of the main breeding season.

Our next control was on the 4th October, approximately 700 meters upstream from the black-billed gull colony near Haul Road. SBBG were spread throughout this wider area and beginning to nest. Individual birds were seen harassing the nearby black-billed gulls on several occasions. Again, we pre-fed the site prior to the shoot then on the morning we came out before dark, set up our bread bait and several SBBG decoys we had saved from the previous control, then hid in the adjacent vegetation. We had an ornithologist stationed nearby to observe the black-billed gull colony to ensure they weren't going to be disturbed by our shooting activity.

Two shooters and one assistant were able to remove 87 adult SBBG during this shoot, which went from 7am until around 10.30am. Three black-billed gulls were also drawn to the decoys and bait but our shooters were able to identify and avoid these birds. Our ornithologist was satisfied that the general black-billed gull colony nearby was not disturbed by this activity as the birds did not appear to behave differently once shooting started. We considered this a good result, as we were successfully able to remove a good number of SBBG from the area surrounding a nesting black-billed gull colony. We repeated a shoot at this location near Haul Road on the 5th of November, again with two shooters and an assistant, and were able to remove a further 90 SBBG from this location.

This season we targeted one large, densely packed SBBG colony upstream of Downs Road for Alpha-chloralose control, that had not been targeted previously. There was a delay in securing alpha-chloralose this season which meant that our contractor couldn't undertake a control at the chosen colony until January 2019 (i.e. late in the breeding season). In order to still undertake SBBG control this season according to the Technical Standard (which specifies that SBBG sitting on eggs are preferred rather than those with young chicks as it reduces the number of chicks needing to be dispatched), staff visited the chosen colony several times in the lead up to the alpha-chloralose poison to smash eggs and dispatch young chicks, in an attempt to delay the breeding cycle of the SBBG and keep adults sitting on eggs.

As part of our Technical Standard requirements for undertaking SBBG control, Courtney rang a list of landowners adjacent to the control site as well as the local vet clinics in Rangiora, to inform them of our intention to undertake an Alpha-chloralose control of SBBG at the chosen location. The phone calls were followed up by an informative email, as per the Technical Standard requirements. Although everyone spoken to was generally supportive or at least understanding of the control operations, one of the vet practices forwarded the email around their office which was then taken out of context and posted on their national office Facebook page. This led to negative publicity and widespread mis-information and confusion around what we were doing. We will be reviewing our Technical Standard prior to next season, which will include reviewing the communication and public notification requirements for these operations.

In previous seasons we have undertaken more than one alpha-chloralose control for the season, which was reflected in higher expenditure for control operations in those years. Although two or more alpha-chloralose controls were undertaken in the past seasons, subsequent controls throughout the season tended to become less successful as:

a) one colony was targeted more than once and the adults were wary of subsequent baiting,
b) there were less SBBG present to be baited in subsequent follow up baits,
c) targeted colonies were becoming more spread out over time after being baited in previous seasons, making them harder and more time consuming to target in subsequent years.

This year we trialed a follow up shot-gun control at the poison site as opposed to a second poison control at the same location. This was largely because it was getting late in the season and a high number of close fledged chicks were now present. This follow up shoot showed useful results in removing a further 160 SBBG from the control site, between six shooters over the course of a morning.

Table 3 - Summary of SBBG Control for 2018-2019 Season

Control Date	Type of Control	Number of Birds Culled	Comments
13 September 2018	Shot Gun	30 Adults	This was a test shoot to see if we could draw SBBG in to a site and successfully shoot outside of breeding season, so this shoot was successful in that regard.
4 October 2018	Shot Gun	87 Adults	X2 shooters, 1 assistant. Near to Black-bill site, but Black-bills not disturbed or harmed.
5 November 2018	Shot Gun	90 Adults	X2 shooters, 1 assistant. Very rainy day but good result, unsure if would have been better in clear conditions?
10 January 2019	Alpha-chlorlose control	800 Adults, 50+ chicks (follow up euthanasia)	Main control for the season, targeted at a dense colony upstream Downs Rd.
28 January 2019	Shot Gun	160 Adults	Follow up shoot at the poison site to further reduce adults present.
Extra:	Purchase of Alpha-chloralose power for next season	N/A	There was a delay getting powder this season which held up our control plans. We have used funding from this season to buy stock prior to next season, so we can begin control early (i.e. as soon as the birds start nesting)
	TOTAL:	**1,167 Adults**	

Table 3 shows a summary of SBBG controlled for the 2018-2019 season in the lower Waimakariri River. The total tally does not include chicks; numerous chicks were removed throughout the season, both to delay the breeding cycle at the Alpha-chloralose control site, and then as follow up euthanasia.

The estimated total Good and Services expenditure on SBBG control in the lower Waimakariri River for the 2018-2019 season is $12,045 plus $2,500 spent on securing Alpha-chloralose stock ready for next season. Total SBBG control expenditure: $14,545

Based on a season expenditure of $12,045 (not counting the additional Alpha-chloralose purchase) and a total of 1,167 Adult SBBG controlled, the average Goods and services cost per bird is around $10.50 (staff and volunteer time is not included).

The number of chicks euthanised and removed from colonies is not included in the final count. Chicks euthanised and eggs crushed was difficult to keep track of logistically.

Table 4: Comparison of Previous Season SBBG Counts and Control Numbers

	Breeding Pairs Counted	Breeding Colonies Counted	Mean Colony Size (breeding pairs)	Adult SBBG removed that season
11/11/2016	5,015	26	193	2,000
1/11/2017	3,031	23	131	1,265
2/11/2018	4,017	36	111	1,167

Wildlife Management international have been contracted for the previous three years to complete aerial SBBG counts from the Waimakariri Gorge to the River mouth. An individual colony was defined as a group of breeding gulls separated by over 500m of river bed which had no breeding gulls.

Wildlife Management noted in their 2018 report that "while the 2017 survey recorded considerably less SBBG than both the 2016 and 2018 surveys this is probably the result of the monitoring being conducted in the opposite direction leading to suboptimal viewing conditions (looking towards the sun) resulting in an underestimate of actual numbers (for 2017). To avoid this problem in future all surveys should be conducted in the morning starting at the river mouth and flying upstream towards the gorge".

Wildlife Management also noted that the colonies appeared to be shifting towards more numerous and spread out smaller colonies, rather than a few large and densely packed colonies, which is consistent with the ECan Parks team and Contract Ornithologist observations.

We hope to continue these annual surveys in future seasons with the support of CIAL, to build a picture of SBBG population trends in the lower Waimakariri River and gauge the success of our SBBG control work.

Total Season Expenditure

Table 5: Summary of Total Season Expenditure

Monitoring and Trapping (contract work)	$14,137.60
Additional Trapping (including estimated additional checks before years end)	$4,810
SBBG Control (includes budget spend on Alpha-chloralose for next season)	$14,295
Additional costs (extra signs, general consumables, hand sanitizer etc)	$800
Total Expenditure	$34,042.60

Further Discussion

This season in the lower Waimakariri was one of frustrations and mixed success. The black-billed gulls were washed out several times but showed their resilience in continuing to re-nest, only to face further interference from people and southern black backed gulls. Despite all the challenges facing the birds this season, the black-billed gulls still managed to produce chicks. Other positives from this season were the sighting of six white-winged black terns in the Waimakariri River, plus further removing a good number of SBBG from the total population throughout the riverbed.

This season further highlighted the relationship between the lower Waimakariri and Ashley/Rakahuri Rivers in terms of breeding habitat for the black-billed gulls. When the main colony of around 2000 black-billed gulls were washed out from the Waimakariri, we are confident it was the same group of birds that then showed up at the Ashley/Rakahuri a short time later. We are also confident that after a fresh through the Ashley/Rakahuri, a portion of those birds then returned to the Waimakariri. The birds appear to use the two as almost interchangeable habitat, which may have implications for the management of these spaces in future.

While we assume it was the same birds moving between the two locations, there is room for research to prove this theory. We will discuss this at the Technical Advisory Group (TAG) meeting prior to next season, as well as any options for better managing the two riverbeds as a joint breeding habitat. If we consider it to be the same group of black-bills split between the Waimakariri and Ashley/Rakahuri, then even though the Waimakariri produced relatively low numbers of fledglings for the season, the Ashley/Rakahuri group are reported to have fledged 400 chicks from 768 breeding pairs, so the overall result for this group of birds would be better than if we just looked at each of the rivers individually.

Monitoring black-fronted terns has proved to be a challenge again this season. In previous years, we decided that, due to the scale of the riverbed and difficulty of monitoring large and often spread out colonies, we would monitor a few “representative birds” at main large colonies and report on the success of those individuals, as a representative of the wider group. Unfortunately, this season we encountered a situation where all our “representative birds” being monitored failed to produce chicks and most abandoned the sites, leaving us little data for this season.

Keeping track of the black-fronted terns throughout the lower Waimakariri continues to be a challenge, due to the size of the area. This year we noted a group of 30 black-fronted terns nesting in the area adjacent to Dixons Bay, but the bird survey through the river in November identified as many as 150 Black-fronted Terns spread across a wider area at this location. As well as being hard to spot all birds present, accessing and monitoring the birds further out towards the middle of the colony would be very difficult without disturbing those attempting to nest closer to the edge. We still believe using representative birds that are easier to monitor is the best methodology to gauge black-fronted tern breeding success at chosen sites, but will raise this for further discussion at the TAG meeting.

We saw again this season again that, while the black-billed gulls are naturally resilient and programmed to keep re-nesting after flood events, they struggle to deal with the additional factors of human interference and unnaturally high SBBG numbers. The Groyne 44 black-bills this season would very likely have successfully produced fledglings if they had not faced the additional and totally unnecessary human behavior of being shot at and then in a separate incident also driven through with a 4WD vehicle. Despite

increasing awareness and publicity for these birds, there are still those that don't know or seemingly don't care that they are threatened and protected under the Wildlife Act. We will continue to explore options to further promote awareness of these birds, and ways to better protect and monitor breeding sites to try and follow up this kind of activity if it happens again.

In addition to human disturbance, we also witnessed more examples of the pressure SBBG place on nesting black-billed gulls. This season we saw an adult SBBG walking through the black-billed gull colony at Downs Road eating the black-bill eggs as it pleased, while the black-billed gulls were trying to drive off the SBBG with no effect. These black-billed gull adults were likely reaching the limit of their energy expenditure after having already withstood several flooding events and surviving being shot at, only to be further decimated by SBBG predation.

Reducing SBBG numbers is an area where we can make real improvement to remove some of the pressure on threatened bird species breeding in the riverbed. We believe that if the black-billed gulls only had to deal with flooding alone, the number of chicks fledged would have been higher this year. We will further discuss SBBG control at the next TAG meeting to ensure we are still following best practice and that the control is still supported by those present.

Because of the flooding this season the bird breeding season was delayed later than usual, with breeding activity evident right throughout February. The birds may have to deal with more erratic weather and river conditions in future, especially flooding events, due to global warming. This further highlights the need for us to reduce additional pressures on the threatened bird species wherever possible. If delayed breeding cycles continue to be seen in to February and March, this may also have implications for bird monitoring consent requirements which only specify the need to monitor birds until the end of January.

This season we were able to establish a permanent predator trap line along a lower section of the North Bank of the Waimakariri River using external funding (Appendix 3). In addition, we also completed a six-week feral cat trapping program along the river frontage between Taylors Road and Harrs Road. This trapping was completed during the winter months leading up to the bird season, in which time we removed eight feral cats from a 4km stretch of river. There is also a trapping program within The Sanctuary Wetland on the opposite side of the river. We hope to continue and expand on these trapping and predator reduction works, to continue reducing the overall predator populations in the riverbed so that there is less pressure on birds during the breeding season.

In addition to year-round mammalian predator reduction, we are also hoping to build on our trials of controlling SBBG outside of the main breeding season. This year we were able to successfully target roosting SBBG for shot-gun control before the birds were on nests. While we didn't remove as many birds as when we were targeting nesting colonies, we still removed a good portion of the colony and disturbed a lot of the birds away from that site. This may be a useful method for removing SBBG from areas we know that black-billed gulls prefer to breed in, prior to the breeding season. We also successfully completed a shoot of SBBG that were reasonably close to a black-bill colony (Haul Rd site), without disturbing the black-bills. This could be another useful tool for future seasons, but only where the shooters have experience in identifying black-billed gulls and their calls and can quickly distinguish these birds from SBBG.

In order to know which breeding areas black-bills prefer we need to compare the data we have from all previous monitored breeding seasons, to gauge if there are sites that the black-bills return to more often. If we can identify regular preferred habitat trends, we may be able to target habitat improvement works like weed clearing and predator reduction towards those sites. We will discuss these options at the TAG meeting.

This season we saw the incredible natural resilience and programming of black-billed gulls to continue attempting to nest and breed, even when faced with continued harsh conditions and additional disturbance. If we work on reducing or removing those additional pressures on the birds that are within our capabilities to reduce, we can hopefully tip the balance back in favor of these birds and help their populations to recover.

References

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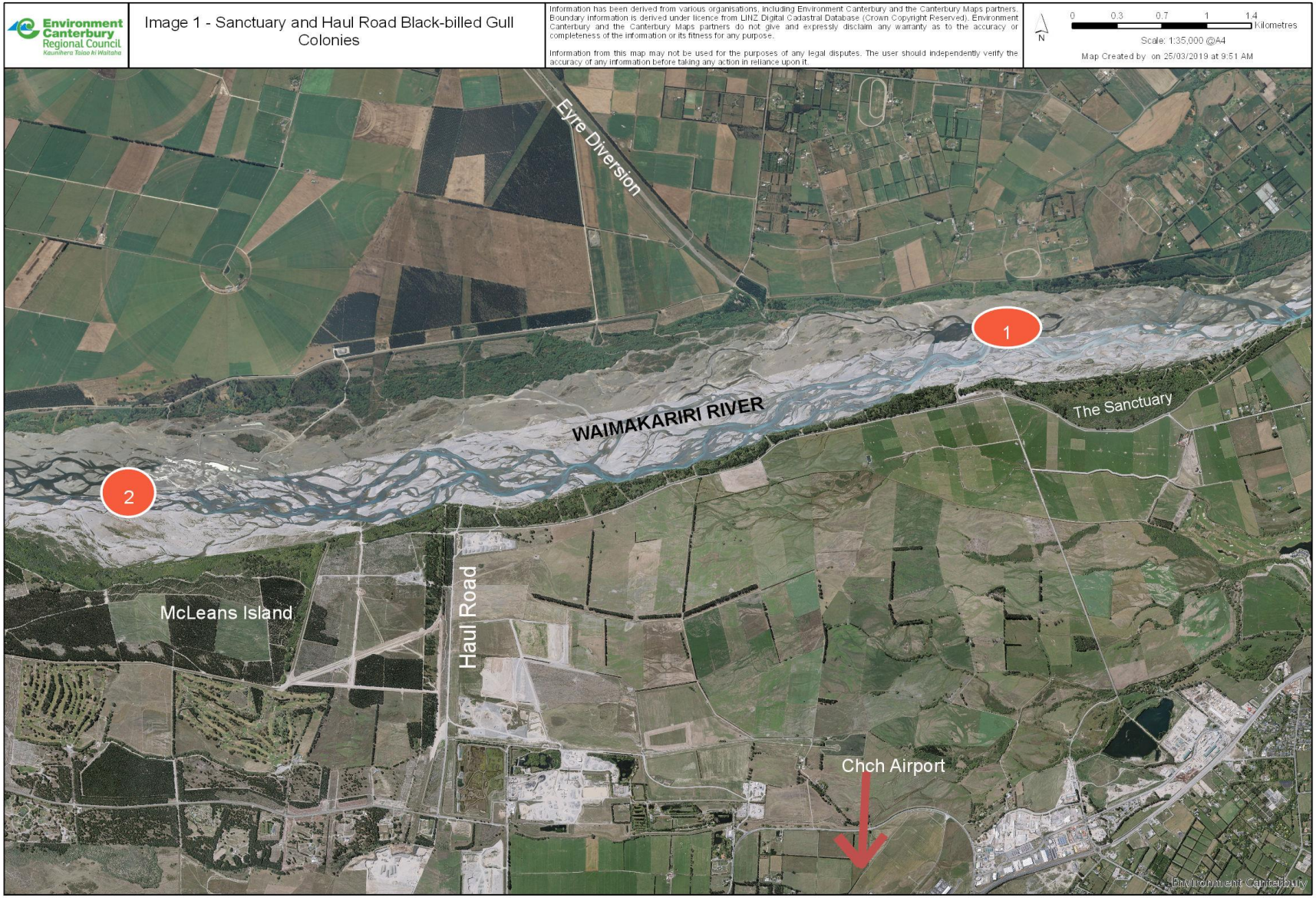
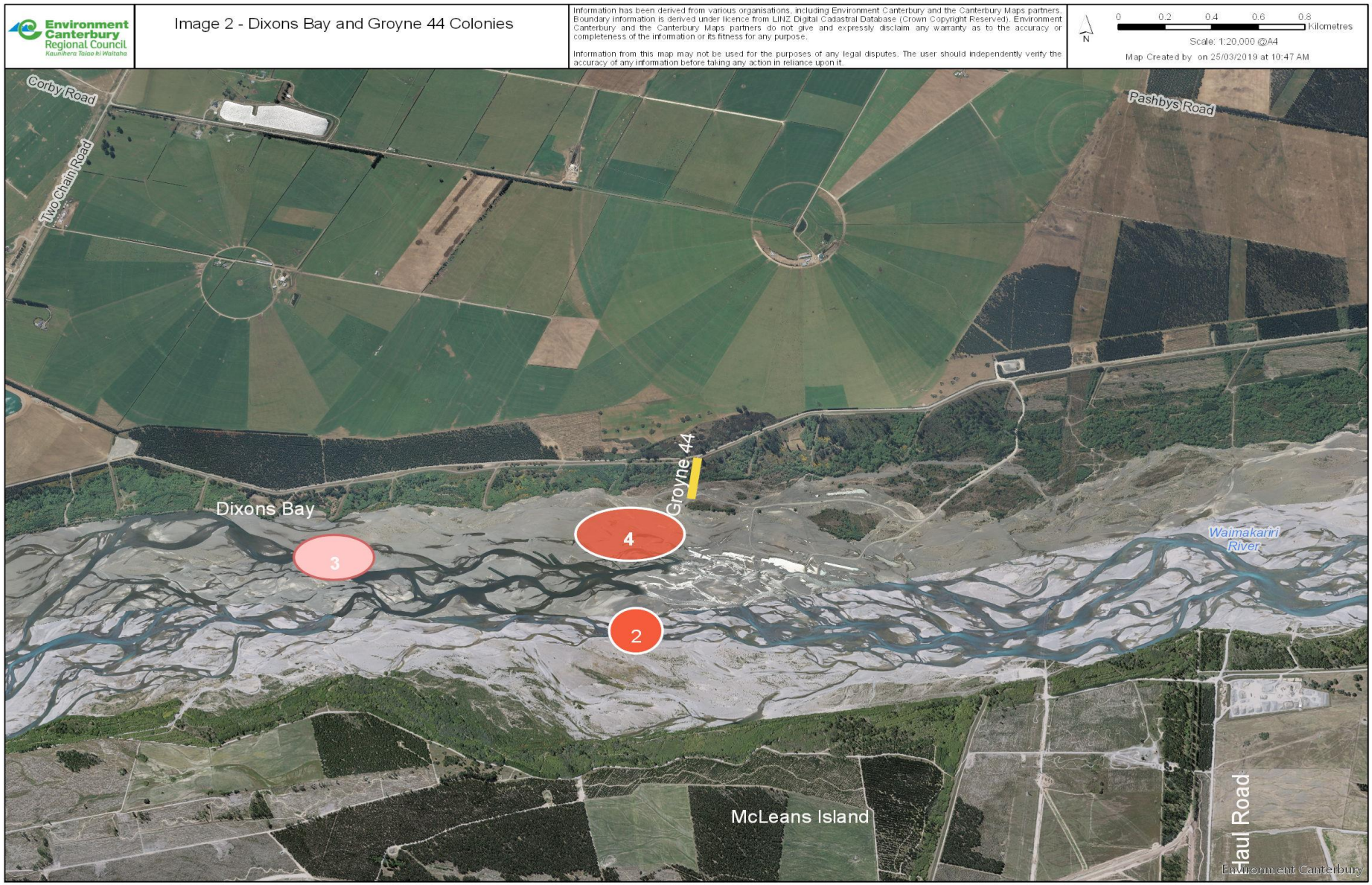
Appendix 1:



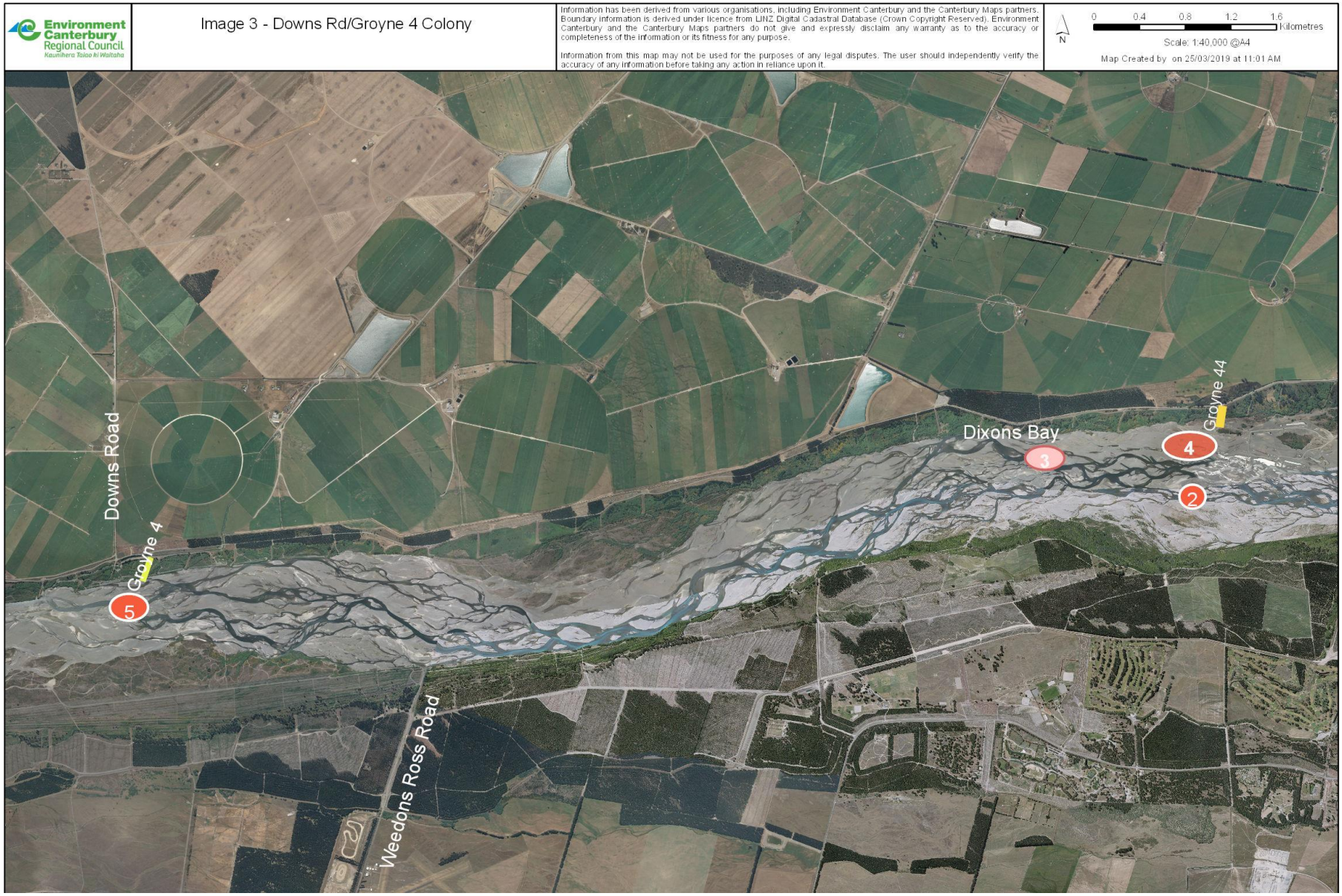
1: Black-billed Gull Colony near The Sanctuary

2: Black-billed Gull colony upstream from Haul Road.



3: Dixons Bay Black-fronted Tern Colony

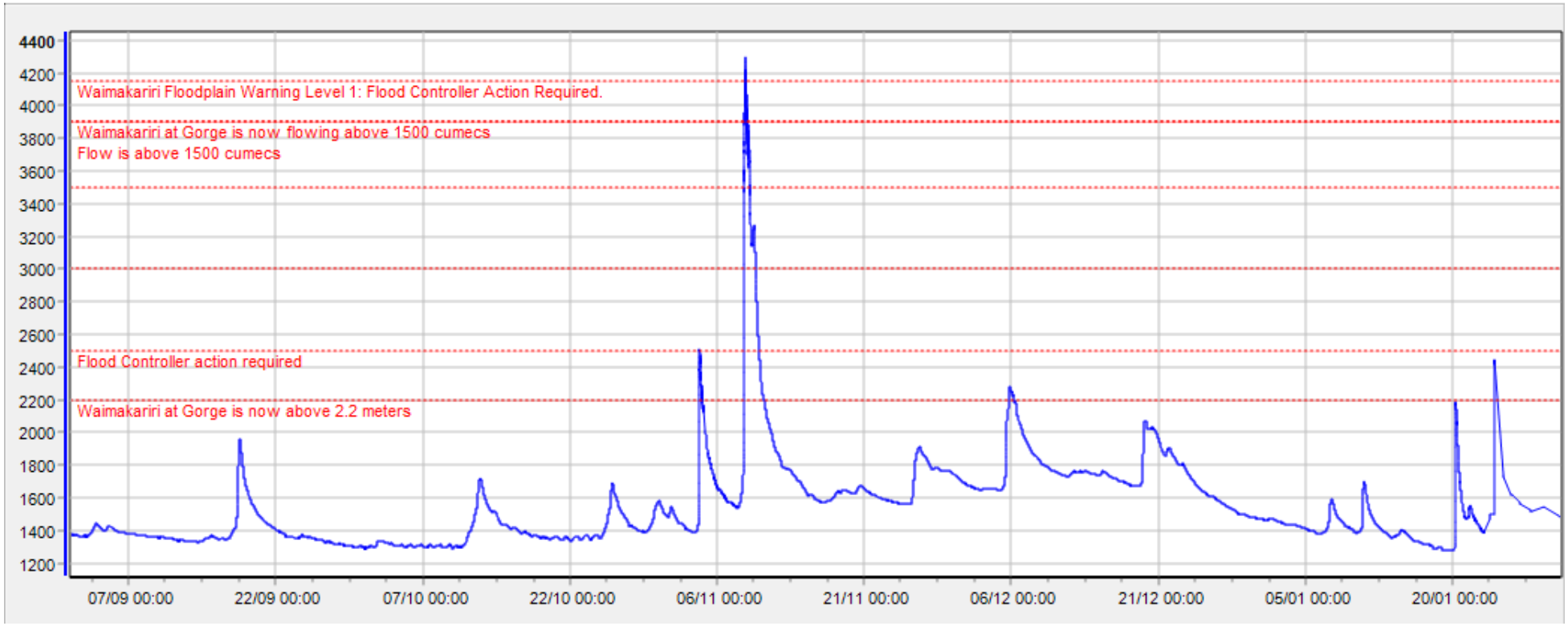
4: Groyne 44 Colony – Black-fronted Terns, White-fronted Terns and Black-billed Gulls



5: Groyne 4/Downs Road Black-billed Gull Colony

Appendix 2:

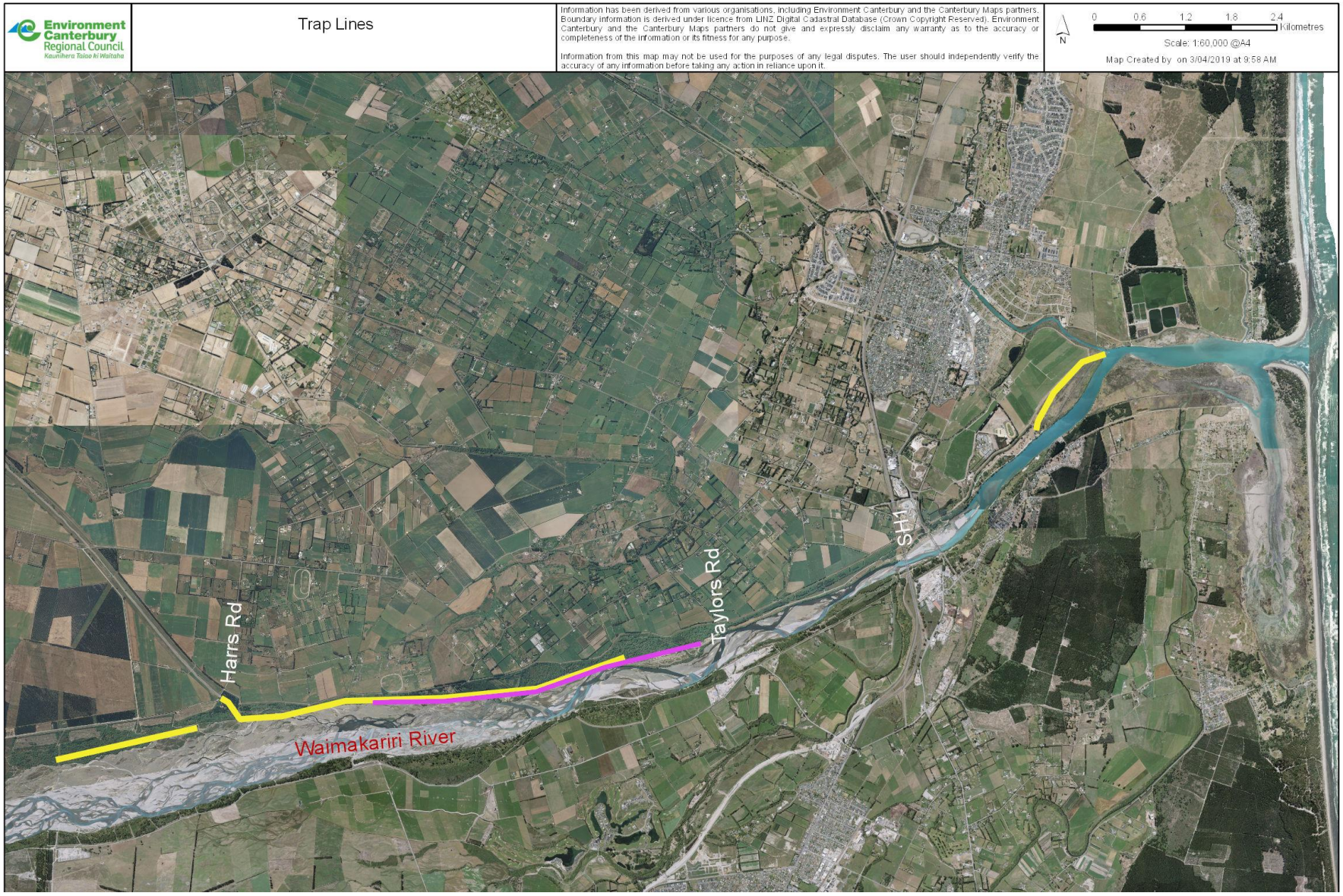
River Flow at the Waimakariri Gorge over the 2018-2018 Bird Breeding Season



Graph shows the river flow at the Waimakariri Gorge between September 2018 and February 2019. The main flood event in November is shown, peaking at over 4.2 metres at the Gorge. This was enough water to cover most of the riverbed downstream to the river mouth.

The graph also highlights several other fresh events during this time period.

Appendix 3:



Yellow line shows permanent predator trap line established in 2018. Purple Line shows extent of 2018 winter feral cat trapping program.