An evaluation of the Ashley Rakahuri Rivercare Group (ARRG) predator trapping data from 2004 to July 2019

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1. Introduction

In the 2018 - 2019 nesting season the majority of banded dotterel and black-fronted tern nests (and that of a wrybill) in the Swamp Road area – near Line A on Figure 1 - were raided by mammalian predators. Rats are suspected. Also at least 9 chicks were taken by ground predators, perhaps ferrets, from the 2018 – 2019 black-billed gull colony near Line N. Nine chicks from a total of approximately 500 is not a significant outcome, but predators could decimate smaller colonies of black-fronted terns or nests of non-colony breeding birds. It is not known if predators ate any of the eggs from the gull colony.

Due to the well-known influence of predation on native bird breeding, including many local incidents such as the above, the ARRG has been conducting systematic predator trapping of the Ashley River margins since 2004. Records of this were kept by Geoff Swailes until February 2019 and have been summarised in the ARRG Annual Reports. Data used in this evaluation report was mainly extracted from the annual report for 2017 – 2018 with some from spreadsheet and database records for data collected subsequent to the date of this annual report. Prior to 2004 some trapping was done, but records are not available. Since February 2019 data has been kept in a purpose-built Microsoft Access database which allows for easy data input and graphical output for user-input time periods.

Figure 1 shows the current locations of traps - which consist predominantly of DoC 200 and Timms types. These were also the most used trap types in the past. Within the last year many any new traps have been installed at approximately 100m intervals. Prior to this time spacings were less regulated but they have generally been about 150m apart. One of the trap lines, Line G, has a DoC and a TIMMS trap at each location. In several other locations this is and has been the case. Traps are now labelled with a trap line and a number, generally running from west to east – e.g. A1, A2. Currently the 17 trap lines are being checked and rebaited at an average of just under twice a month.

Bait for DoC 200 traps has always been eggs, augmented with whatever the individual trapper decides – this has included cat biscuits, Eraze, fresh meat and curry powder. Timms traps have most often been baited with salted hare meat, but other meats are used, including cheerios and Eraze. Details of bait have not been recorded so nothing can be said about the efficacy of different types.

Prior to the start of March 2014, traps were kept out only for the nesting season – approximately August to February. These traps were largely in the area to the north of Rangiora and extending upstream and downstream for about 2- 3km. Since that date traps have been installed and checked all year round and trap numbers have markedly increased from about 50 to the current 242 – with new lines installed both upstream and downstream of the original traps, and new traps installed to fill gaps in existing lines. Currently the 17 lines are checked by 16 volunteers.

From June 2018 new traps were installed around the margins of the Ashley estuary and as far upstream as State Highway 1 – there are now 138 traps in this area. Traps in this area are checked by a separate group of volunteers and the data is collated separately from that of the ARRG proper. There is currently a well-advanced plan to install traps on either side of the river as far upstream as the Ashley – Okuku confluence and as far downstream as State Highway 1. This would bring the total number of river-side traps to 380.

Temporary traps are often placed around nesting colonies, for example in 2018 – 2019 some were installed around the black-billed gull colony near Line N and the tern colony (with many banded dotterels in the area) near the top of Line A.

The Ashley River does not currently have a problem with predation by black-backed gulls which are the main predator for breeding birds on the Waimakariri river. Despite large breeding colonies of these birds at the estuary, few are seen up the river. Since 2004 just a single black-backed gull nest has been located in the study area.
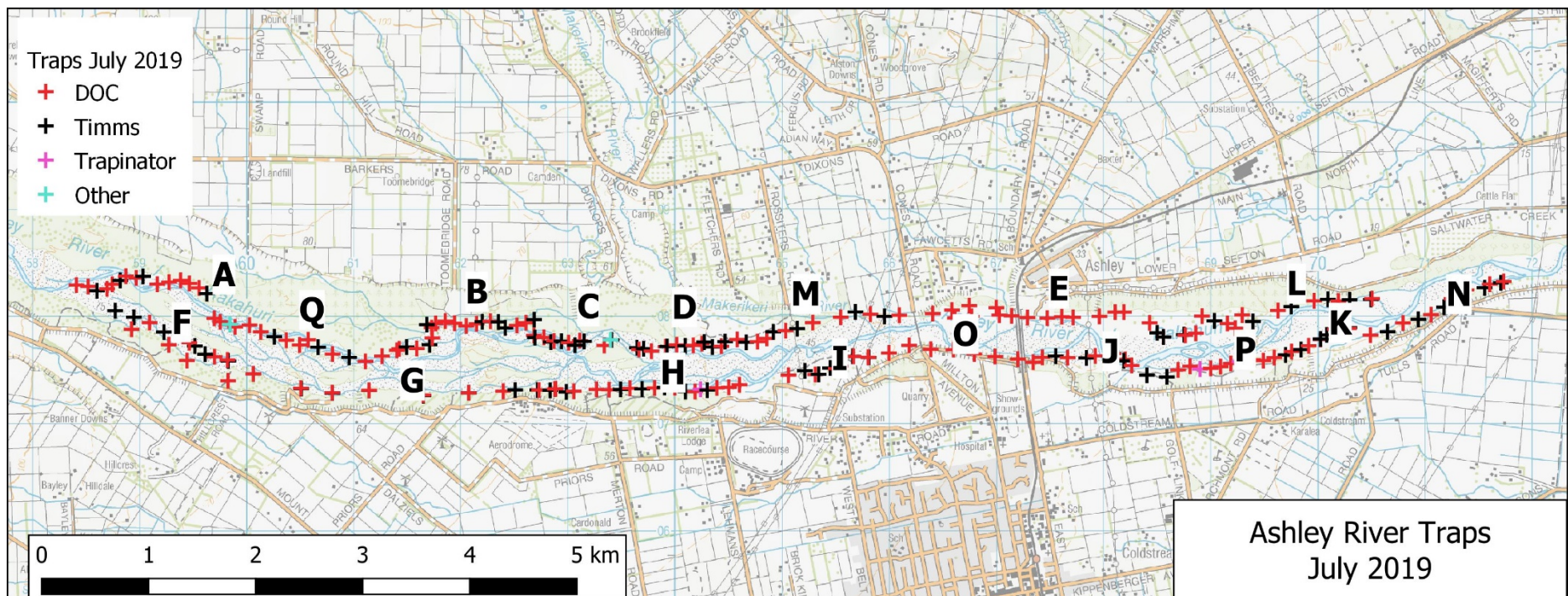
Figure 1. Trap locations in July 2019

2. Trapping Results Evaluation

2.1 Results for the Period 2004 - 2019

Figure 2 graphically represents the predators trapped per year (grouped by species) and the trap numbers and trap nights. The large increase in the number of predators caught since 2014 is, as mentioned above, due largely to year-round trap checking and a large increase in trap numbers. Other features of note are the decreasing percentage of the hedgehog make-up of the total catch over the years and the large increase in rats since 2016. Hedgehogs were by far the most common species caught, with 856 in total from 2004 to April 2019.
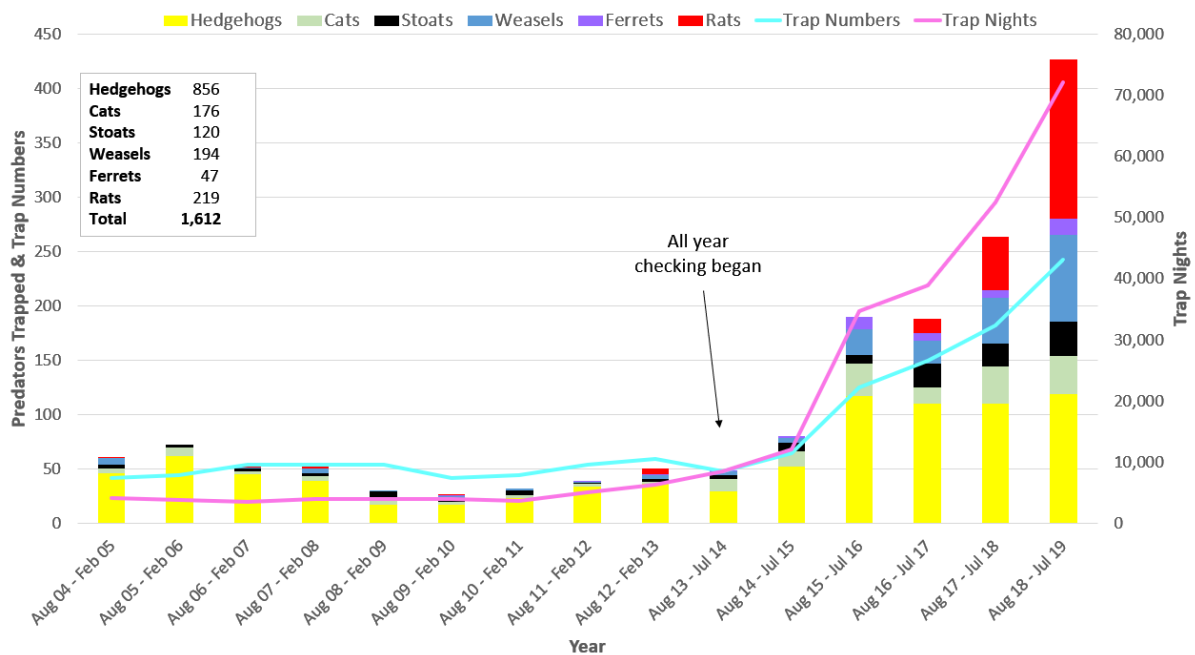

Figure 2. Predators trapped, trap numbers and trap nights - 2004 – 2019

Figure 3 is a plot of total predator catch per hundred trap nights (CPHN) from 2004 to 2018. This shows a marked general decline over the years. The ARRG have previously interpreted this to be due to the trapping programme reducing the predator population. However, if trapping had led to a decrease of CPHN over time, there should surely have been an increase in this measure since 2014 due to the large increase in trapped area. Given that predators will enter the trapped area from upstream, downstream and either side of the river to replace those caught in traps, the approximately 50 traps used prior to 2015 cannot have significantly decreased the predator numbers in the new areas trapped since then. Other interpretations of the declining CPHN trend could involve predators becoming more wary of the traps over time, or possibly something unrelated to trapping.

It is also interesting to note that the CPHN at the estuary from August 2018 to February 2019 (trapping started there in late June 2018) was 0.5 compared with 0.43 for the river in the same period. These are different areas, but the very similar results do not seem to indicate significantly fewer predators along the river than at the estuary – which might be expected if trapping had reduced the predator population along the river.
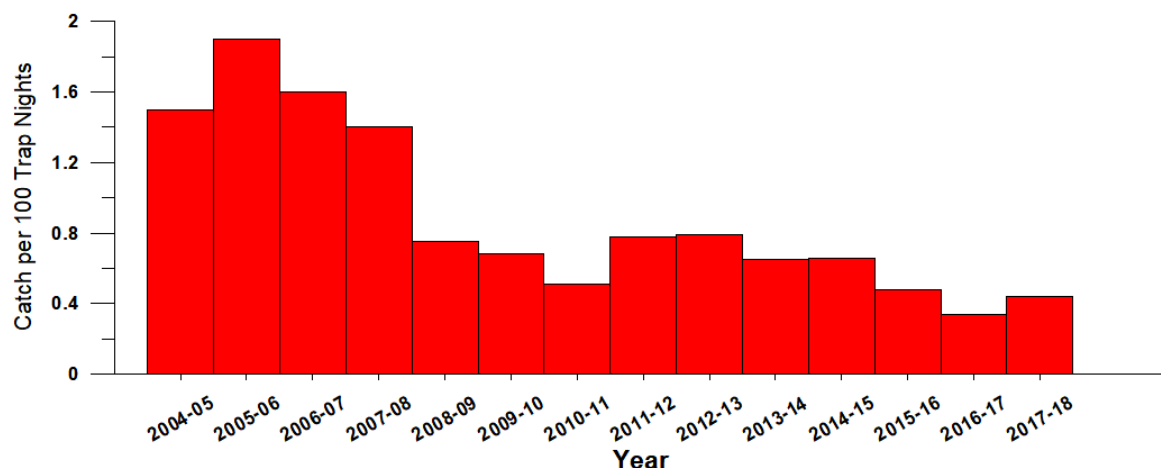
Figure 3. Catch per 100 trap nights, 2004 - 2018

When CPHN is separated into the individual predator species (Figure 4) it is clear that the decline has only been for hedgehogs. This is further emphasised in Figure 5. It seems probable that this decline is due to either a natural boom – bust cycle of hedgehog numbers or perhaps more likely to a factor such as disease. Also, it is thought that major floods affect hedgehogs more than other predators. For reasons unknown, the number of hedgehogs caught at the estuary has been extremely small – only 8 from a grand total of 298 predators caught between late June 2018 and the end of July 2019.

Rats as a percentage of total catch have been much greater at the estuary than along the river – 55% at the estuary in total, but this is increasing – from 1 February to 24 April 2019 it has been 61%. In the same time along the river rat percentage was 35%. Prior to 2016 rat catch averaged 1 per year.
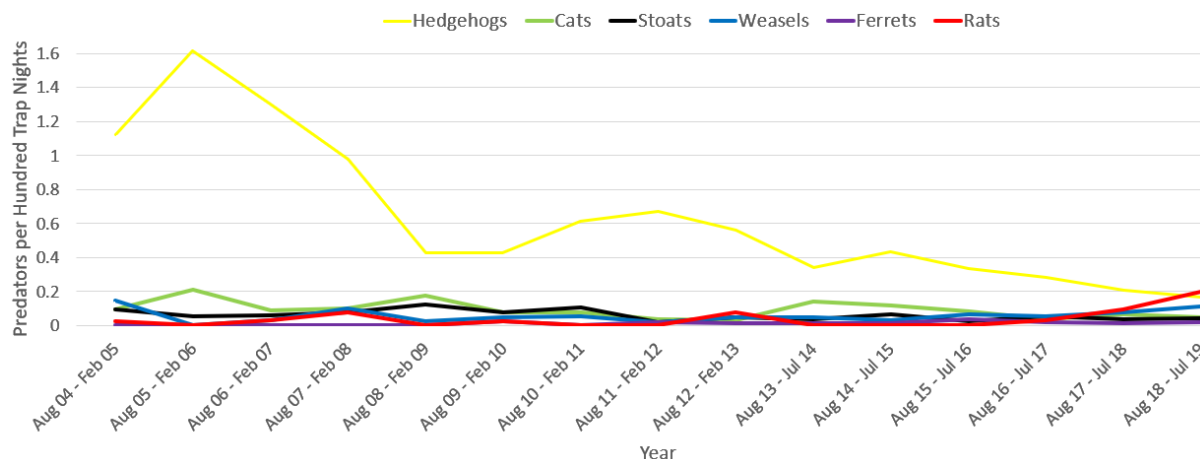

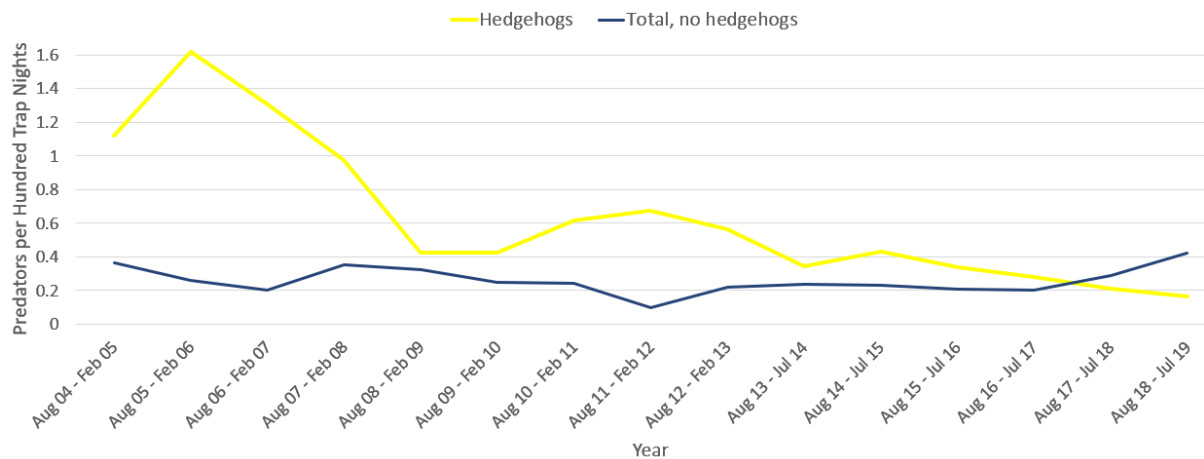*Figure 4. Predators per 100 trap nights, per species*

Figure 5. Predators per 100 trap nights, hedgehogs and total of other species

Figure 6 shows that the recent increase in CPHN other than for hedgehogs in recent times has been due mainly to rats and weasels. There has been a small increase in ferrets caught per 100 trap nights since the beginning of the trapping programme whilst feral cat and stoat figures seem erratic.
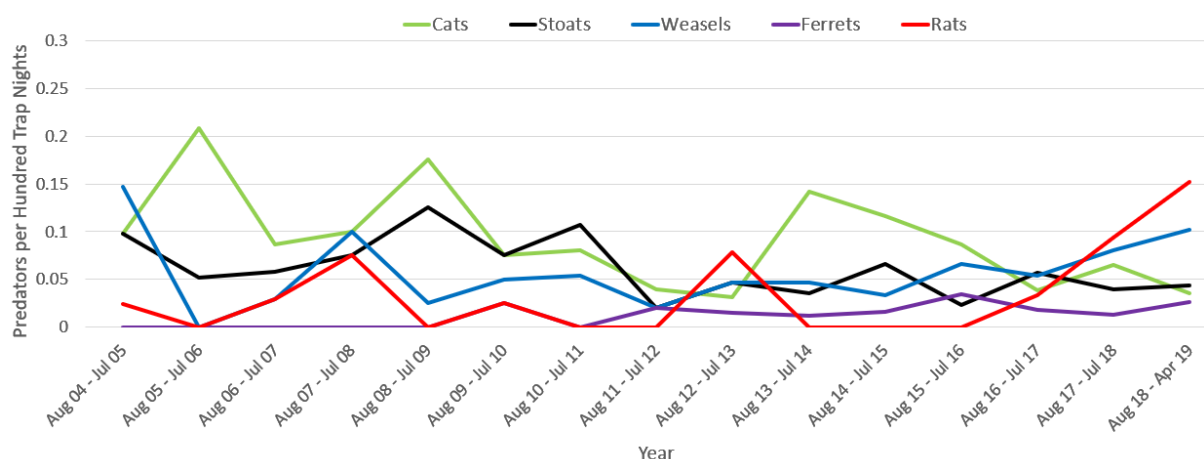

Figure 6. Predators per 100 trap nights, other than hedgehogs

2.2   Results for Trap Type, February 2019 – July 2019

Figure 7 shows CPHN, grouped by trap type. DoC traps are approximately twice as effective at killing predators as Timms. There were only 3 Trapinators at the time of this report, since 1 February they had not caught any of the predators we are targeting – but have caught some possums. Timms and Trapinator traps were installed mainly to catch feral cats. Figure 8 appears to show that all other main predator species are also caught by the Timms traps. However, catch per trap type needs to be treated with caution as mistakes in recording were possible.
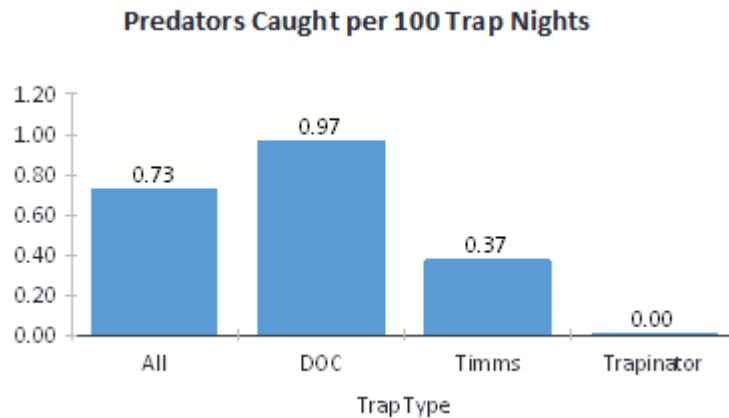
Predators Caught per 100 Trap Nights

Figure 7. Predators per 100 trap nights, grouped by trap type – 1 February to 31 July 2019
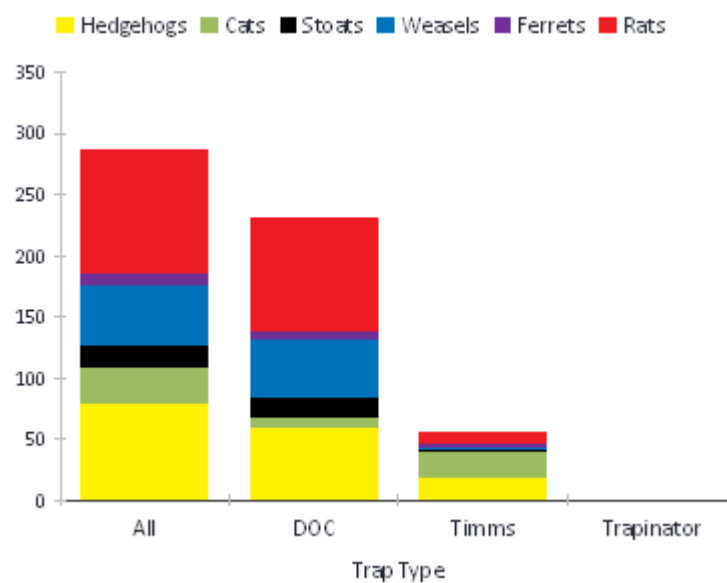

Figure 8. Predators caught by trap type - 1 February to 31 July 2019

2.3   Results for Cover Type, February 2019 – July 2019

Traps were classified as to the vegetation/cover in the area in which they are installed, and the CPHN for each classification and species was calculated. Classifications used were scrub (mainly gorse and broom), single tree (usually a pine or willow in a scrubby area) or trees (a line or cluster of trees). Some traps were moved in the period, these were classified as cover uncertain. Results of this are shown in Figure 9.
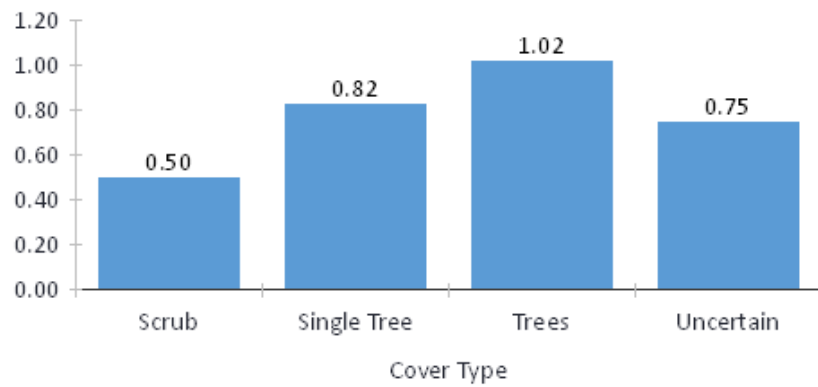
Traps installed beneath trees are the most productive with about twice the total catch of those in scrub. Single tree placement is also more productive. However, much of this effect is due to rats being more than four times as likely to be caught under trees than in scrub. Rat species have not been recorded, but the affinity for trees could mean that most rats caught have been Ship Rats. Rats do occur out along the active riverbed and are thought to perhaps be a major problem. These could be Norway Rats. It is uncertain whether Ship Rats occur along the active riverbeds.

Ferrets and stoats are approximately twice as likely to be caught under trees as in scrub whereas weasels are caught at a similar rate in the different vegetation/cover types. Cats are more often caught

in scrub and under single trees in scrub. Hedgehogs are more likely to be caught under trees and single trees than in scrub.

More data is required to properly validate the above conclusions.

Total Predators Caught per 100 Trap Nights by Cover Type

Catch per 100 trap nights for each species and cover type:

Cover Type	Trap Nights	Hedgehogs	Cats	Stoats	Weasels	Ferrets	Rats
Scrub	19189	0.156	0.083	0.026	0.120	0.016	0.094
Single Tree	2187	0.366	0.229	0.000	0.091	0.046	0.091
Trees	14468	0.283	0.048	0.069	0.138	0.035	0.442
Uncertain	3620	0.028	0.028	0.110	0.110	0.028	0.442

Figure 9. Distribution of predators by cover type caught from August 2017 to July 2018

2.4   Results by Area, February 2019 – July 2019

Figures 9 and 10 are an attempt to show the distribution of predators caught in 2017 – 2018 and 2018 – 2019. Too much should not be read into these maps, partly because of different numbers of traps on the lines, additional traps put in and not being there for the entire period, traps moved, differing rates of checking and differing ratios of DoC 200 vs Timms traps. Some points:

- The biggest influence on location of catch is probably cover type – as outlined above.
- The greatest catch has been in the downstream half of the north bank of the river. Most of these traps are under trees, but there could be other factors.
- Lines K and particularly I have low catches. This is due to most traps being in scrub, but also perhaps partly because their hinterland is largely the Rangiora town. Traps on Line O are also unproductive, but they have been fairly recently installed.
- The upstream half of the north bank has had more cats caught than elsewhere.
- There have been more ferrets caught on the downstream half of the south bank, especially since August 2018 – and in lines K and N. These lines are near the 2018 – 2019 black-billed gull colony where ferrets are suspected of taking at least 9 chicks.
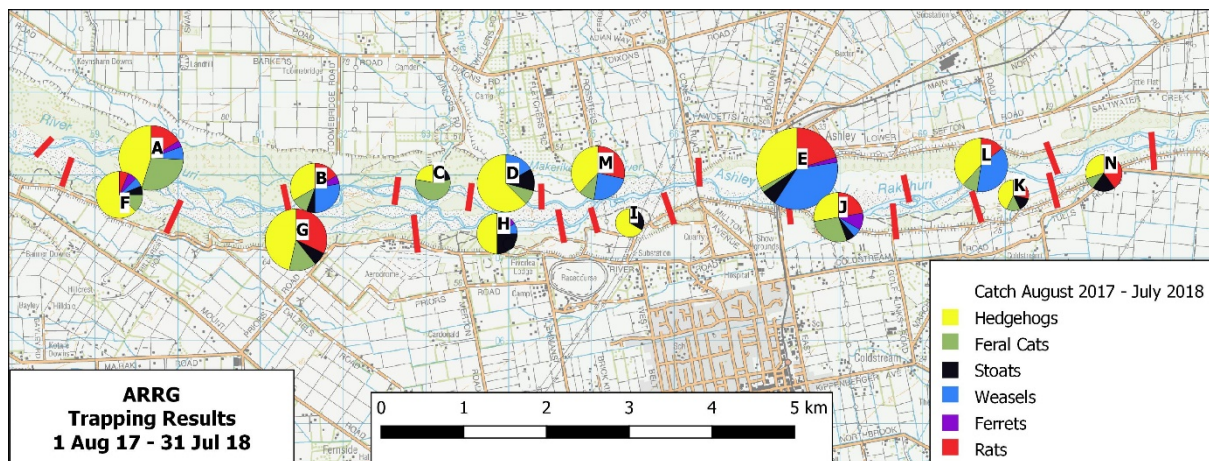- The increase in rats over time is clear.

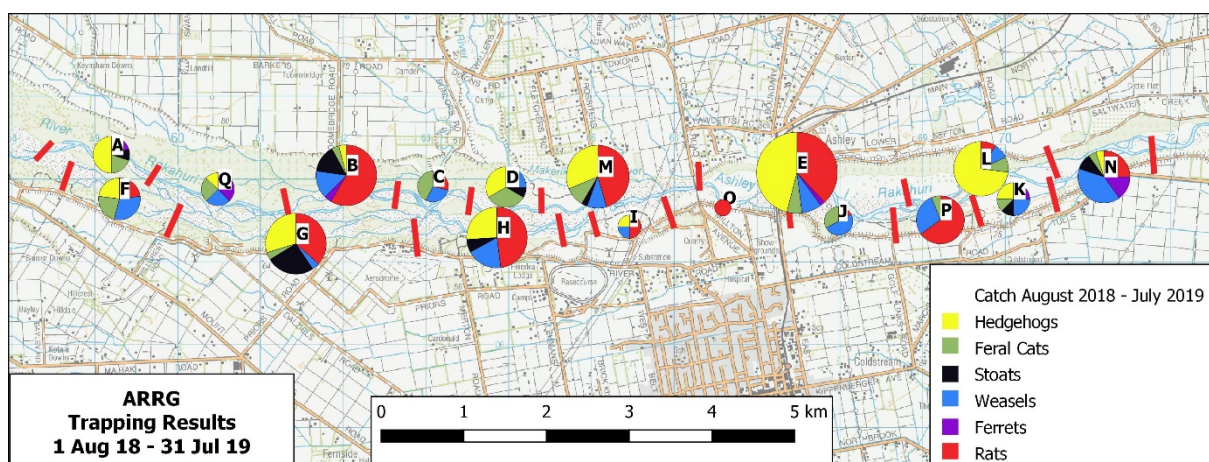Figure 10. Distribution of predators caught from August 2017 to July 2018

Figure 11. Distribution of predators caught from August 2018 to 24 April 2019

2.4   Results by Month, February 2019 – July 2019

Figure 12 shows the monthly catch by predator since February 2019. Points of interest:

- Rat catch increased from March to April and remained fairly steady to June.
- Weasel catch increased significantly in June.
- As would be expected hedgehog catch declined in the colder months.
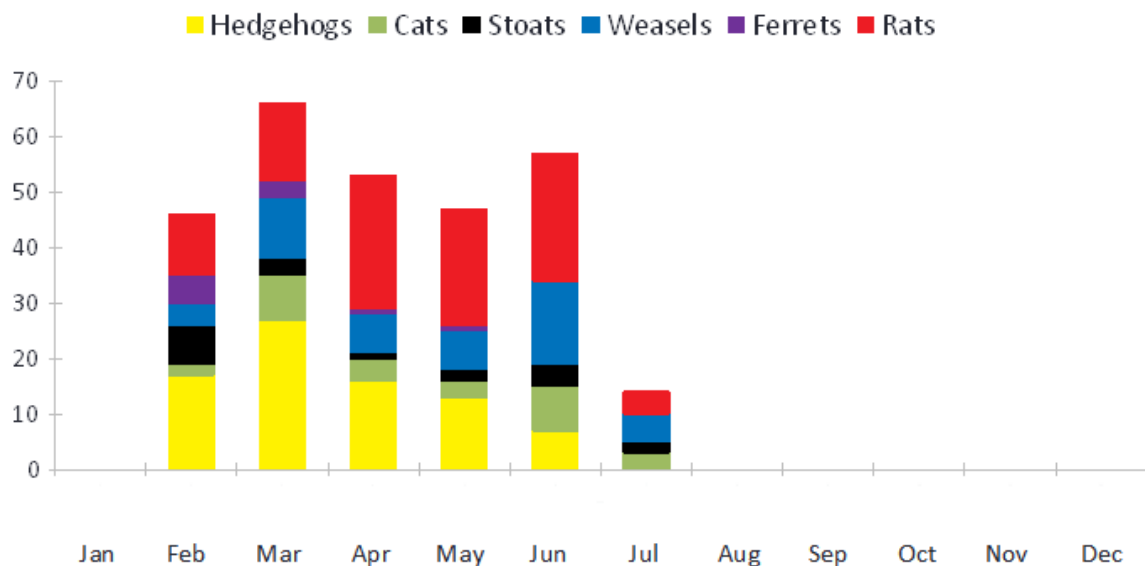- Total catch, for reasons unknown, plummeted in July.

Figure 12. Catch per month from February 2018 to July 2019

3. Conclusions

1. The general decline in predators caught per 100 trap nights does not represent dwindling predator population and success for the trapping programme. Rather it represents a decline in hedgehog numbers probably due to natural cycles or disease. However, because of the ample evidence of mammalian predators having an adverse effect on birds in the river, trapping should continue and be extended.
2. Trapping just along the margins of the river and estuary does not seem likely to lead to a significant reduction in predator numbers. Traps along hedgerows, shelter belts and around farm buildings for perhaps 2km either side of the river, in conjunction with the margin trapping, could perhaps do this.
3. Weasel and particularly rat numbers are increasing along the river and especially at the estuary. From recent media reports it seems that there is a nation-wide boom in rat numbers. The increase in weasel numbers could be due to an increase in mice – recently more signs of mice has been seen – and perhaps also due to the rat boom.
4. DoC 200 traps seem to be at least twice as successful at trapping predators as Timms traps.
5. Traps installed under trees appear to be more successful in trapping most predators than those in scrub.

4. **Recommendations**

1. The planned expansion of trapping along the river, both upstream and downstream, should continue.
2. A programme to install traps perhaps 2km either side of the river should be considered. Such a programme would have seemed impossible a few years ago, but with current attitudes it is possible that funds could be raised, and landowners could become sufficiently interested to become involved. It took a similar trap placement strategy by DoC near Twizel (with black-fronted terns) and in the Clarence valley to make significant improvements in breeding success (Nick Ledgard pers. comm.)
3. It is planned to install traps around each nesting colony on the river, and perhaps near each wrybill nest. These traps will have to be temporarily removed if floods are forecast.
4. Rats are becoming a potential major problem; baiting is planned. Trappers are already recording rat species.
5. DoC 200 and Timms traps have generally been installed at the ratio of 1:1. DoC 200 traps are much more successful but do not trap cats. From experience at the river and estuary, Timms traps seem more successful at catching predators other than cats than are Trapinators. In future trapping the DoC 200 vs Timms ratio should be approximately 2:1 to 3:1. Some of the existing Timms traps could be replaced by DoC 200s.
6. In future traps should probably be installed mainly under trees. This should result in higher catch, less traps lost to flood, and often better access. The ranges of the target species are probably such that sites under trees further from the river are likely to catch the same animals as those in scrub closer to the river.
7. More use should be made of trail cameras and maybe tracking tunnels to get a better idea of predator numbers and behaviour.
8. Experience from elsewhere (especially by DoC) needs to be considered for future planning of the ARRG trapping.