2018 Little Akaloa feral goat removal operation: result report

Tom MacTavish

Department of Conservation
Te Papa Atawhai

BANKS PENINSULA CONSERVATION TRUST

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Cover: Mustering goats, Little Alkaloa. *Photo: Gavin Marshall*

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Department of Conservation
Mahaanui / Sockburn Office
PO Box 11089
Sockburn 8443
Christchurch

Introduction

In 2003 Environment Canterbury (ECan), the Christchurch City Council (CCC), the Department of Conservation (DOC) and the Banks Peninsula Conservation Trust (BPCT) formed a partnership with the objective of eradicating feral goats from Banks Peninsula[1] . Progress was initially promising but in the early 2010s a number of factors (e.g. earthquakes, lack of cooperation from landowners and reduced funding) combined to stall the programme.

Recently, extra funding from the Rod Donald Banks Peninsula Trust provided the four agencies with the opportunity to attempt a one-off eradication of a feral goat population centred near Little Akaloa, trialling a fresh approach. The trial (in 2017/18) was regionally unique in applying intensive eradication methods – developed on offshore islands – to Banks Peninsula's complex, people-dominated landscape.

The Little Akaloa feral goat population is one of up to seven discrete feral goat populations that remain on Banks Peninsula. It was deemed to be the most appropriate population for an eradication trial due to its isolation and the threat that its continued expansion posed to biodiversity values in adjacent areas[2]. It was thought that, if it was successful, the 2017/18 Little Akaloa goat removal operation could act as a template that could be progressively applied to the remaining six feral goat populations across Banks Peninsula.

The operation comprised two parts – a muster followed by a hunt – and required support and sometimes direct input from over 30 different landowners (Fig. 1). Full details of the plan and its background can be found in the *Removal of Feral Goats from Little Akaloa 2018 Operations Plan*[2]. The purpose of this report is to present a post-operational summary that re-visits the operation's targets, briefly outlines the methods, discusses the result and then finishes with findings and recommendations for future operations. The report provides a basis for further discussion/input to improve goat removal methods for future operations.

Overall result target

Reduce the feral goat population centred near Little Akaloa to zero detectable density by August 2018.

Muster summary

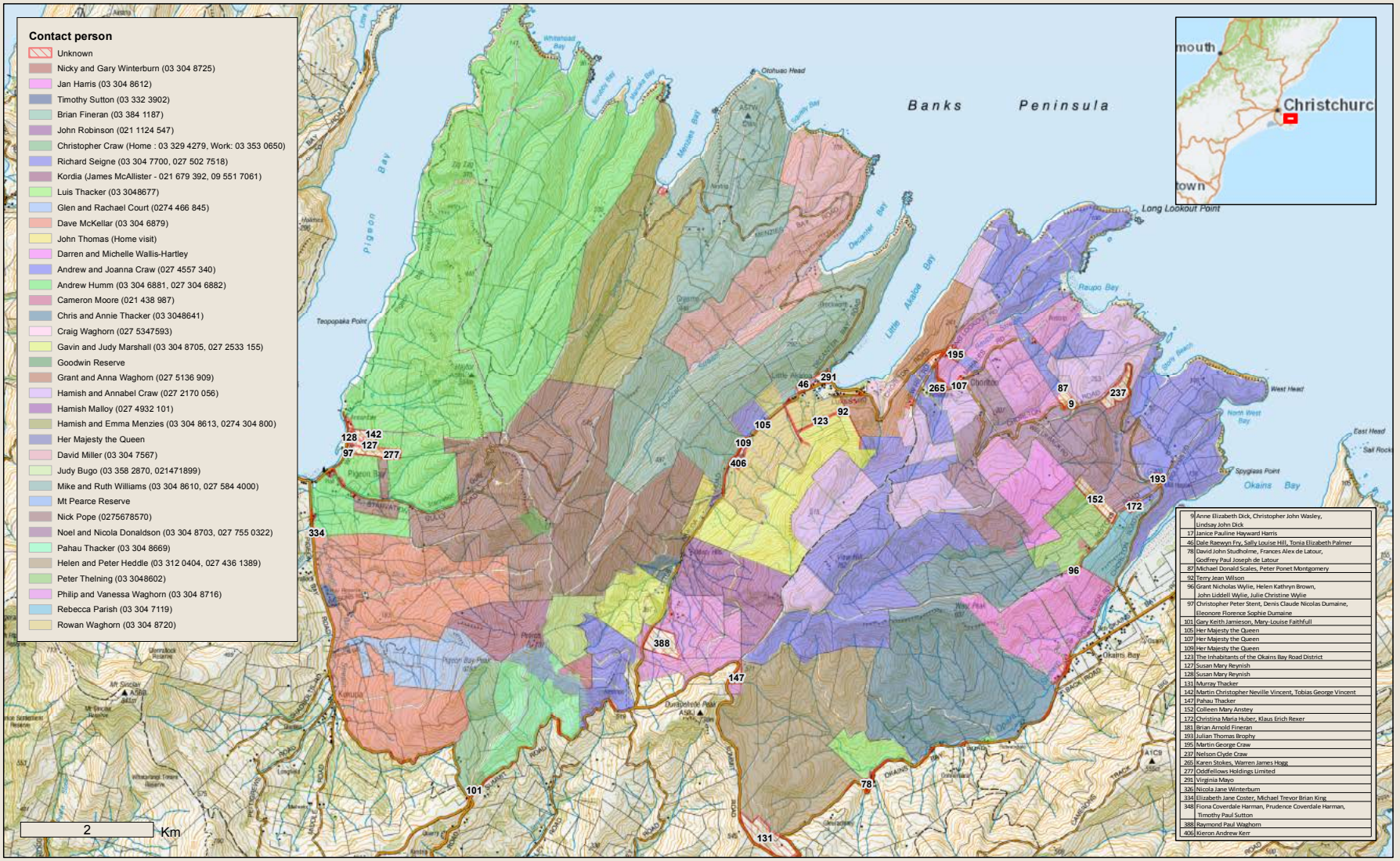
Muster result target

Reduce the feral goat population in the core Little Akaloa area (Fig. 1) by **80%**.

Method

Two professional goat musterers – Nigel Sinton and David Hutchings – led the muster. One musterer focused on moving the feral goats out of bush and bluff areas, while the other focused on ambushing the goats (with heading dogs) when they moved into the open. Some goats were moved out of the bush by 'barking up' with huntaway dogs while others were methodically pushed out by CCC and DOC rangers (i.e. using a 'human wall' technique). Throughout the operation spotters were strategically positioned in locations where they could

[1] References are numbered and listed at the end of the report.



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Little Akaloa feral goat removal operation 2018
Extended landowners overview map

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Figure 1. Map showing property ownership within the area that was considered at risk from Little Akaloa's expanding feral goat population.

provide musterers and rangers with intelligence (Figs 2 & 3). Goats were mustered into yards that had been temporarily constructed using Fahey fences (Fig. 4). They were then loaded onto David Hutchings' stock truck and transferred to goat-proof covered yards to await transport to a meat processing plant in the North Island (Fig. 5).

The muster operation was carried out across three days. On the first day, 145 goats were mustered (Fig. 2), followed by a further 76 on the second day (Fig. 3). Although some goats remained after two days of mustering, the operation was discontinued because it was clear that the weather would not be suitable for further mustering. Moreover, David Hutchings' truck didn't have the capacity to carry any more animals than had already been mustered and it was also clear that the 80% removal target was close. The third day was spent sorting and loading the feral goats (by size and gender) so David Hutchings could transport them safely to the North Island.

Result

The target of an 80% reduction in the size of the feral goat population in the muster area appears to have been reached. When the muster total (221) was added to the number of goats later shot in the muster area (55), the total was 276. The 221 mustered goats comprised 80.1% of this total.

It should be noted that a local farmer – Mike Williams – also mustered 14 feral goats on his property (which was outside the designated muster area) in May 2018. Thus, the muster total in the wider operational area was 234, which is 77.4 % of the overall tally of 302 feral goats either mustered or shot in the Little Akaloa area in 2017–18.

Findings and recommendations (*by Phil Crutchley, Kenny Rose and Tom MacTavish*)

- **Mustering is likely to be useful in future feral goat removal operations.** At Little Akaloa the muster encouraged farmer input, which built mutual respect and, ultimately, led to the full, voluntary landowner permission required to remove all feral goats from the area. Additionally, the sale of mustered feral goats provides some further economic benefits (which just killing and leaving the animals doesn't).
- **Specialist goat mustering contractors should be used for muster operations.** David Hutchings' goat mustering skills, the continuous availability of his goat truck and his stock processing contacts helped us overcome some of the key challenges that plagued previous agency-initiated goat muster operations on Banks Peninsula. In short, David was a one-stop shop for technical skills as well as transport (both on-site and off-site) and the on-selling of the mustered goats.
- **Goat mustering contractors should have a site visit prior to any operation.** David Hutchings was flown down to scope the Little Akaloa population, which allowed for proper planning, built confidence and ensured commitment.
- **Weather contingency plans at least equivalent to that of the Little Akaloa operation are needed for future muster operations.** Five days were allowed for the muster, but the weather was only suitable on two of those days. Both were needed to complete the muster.
- **Fahey fences should be set aside for future muster operations.** Fahey fences make it possible to quickly and efficiently construct strong, goat-proof yards in the best locations.
- **Future muster operations may benefit from having more herders.** At Little Akaloa, David Hutchings, Nigel Sinton and their dogs were indispensable in open areas, but the operation benefited from the presence of rangers who often herded the goats out of bush and bluffs and into open areas.
- **Animal welfare needs to remain a focus in future muster operations.** There is growing community awareness regarding animal welfare – particularly with respect to livestock transport – and Ministry for Primary Industries (MPI) regulations are strict. Thus, it was re-assuring to have planned for a veterinarian to be present for stock loading, and a

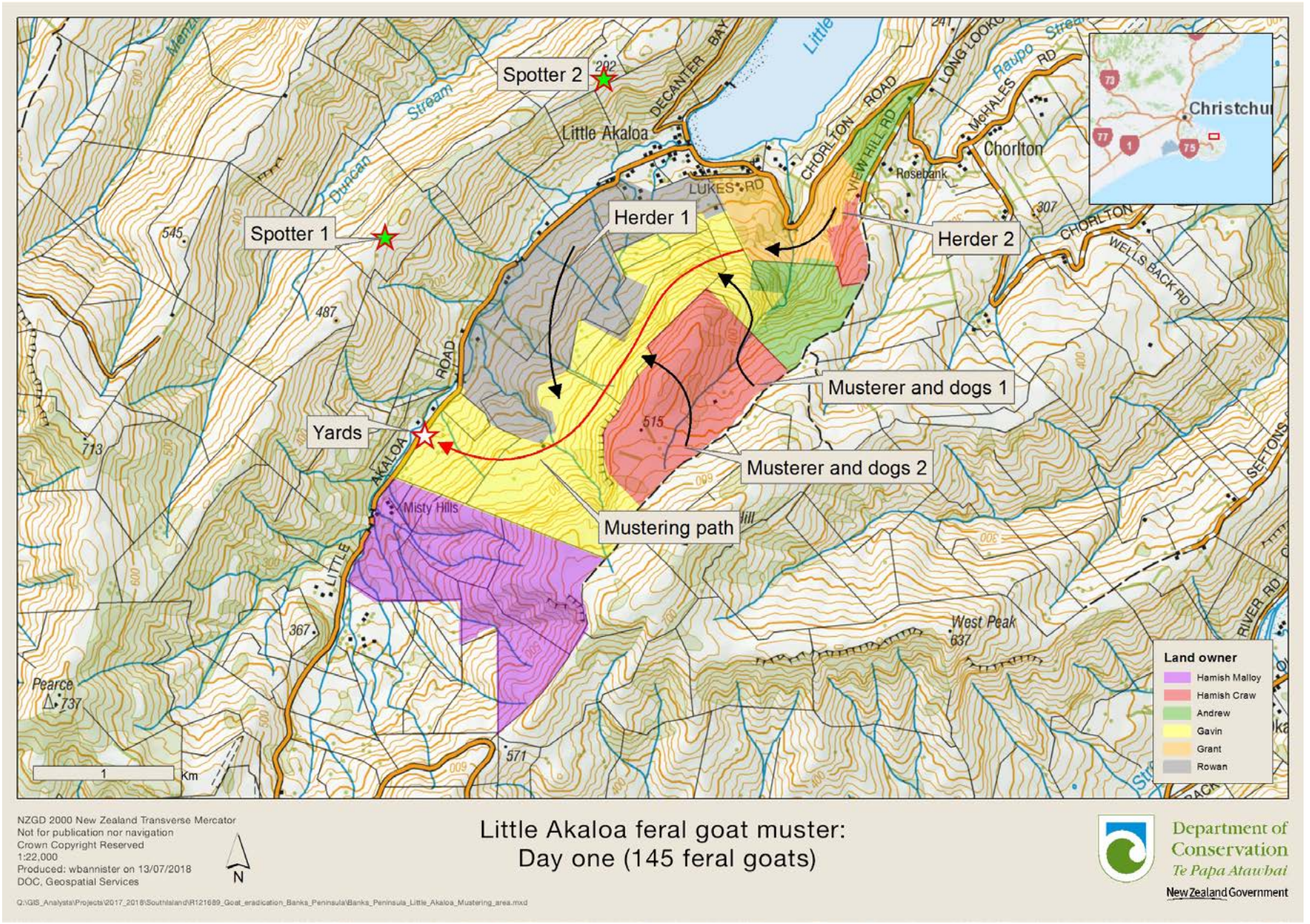

Figure 2. On day one, 145 feral goats (red arrow) were herded from the northeastern end of the Little Akaloa goat removal area through Gavin Marshall's property to the temporary yards. *Map: Will Bannister.*

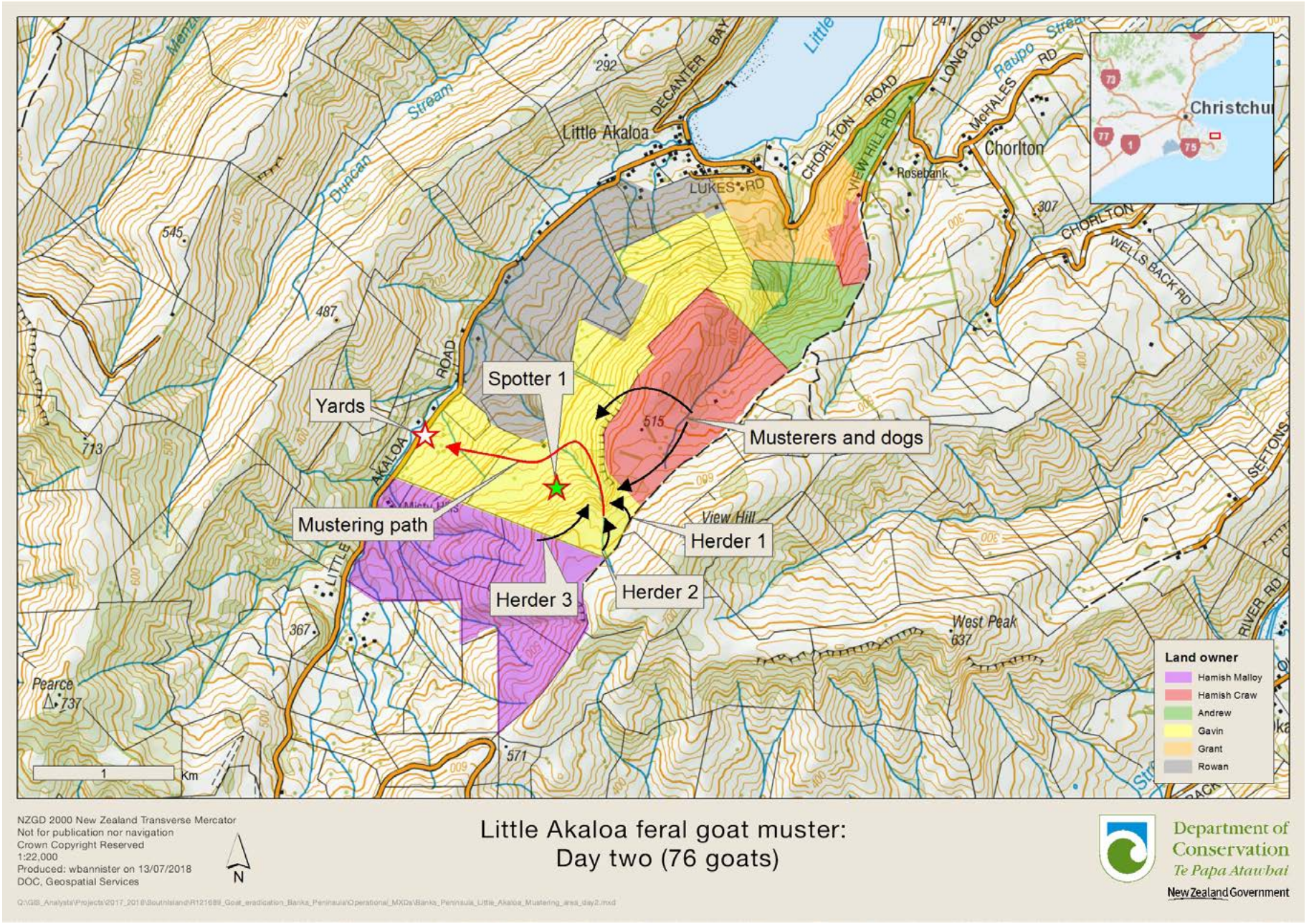

Figure 3. On day two, 76 feral goats (red arrow) were herded out of a favoured bush gully in the southeast of the Little Akaloa muster area and down to the temporary yards. *Map: Will Bannister.*

Figure 4. Temporary goat-proof yards constructed by CCC and DOC rangers using CCC's Fahey fences. *Photo: Tom MacTavish.*

Figure 5. Mustered goats were held in covered yards where nannies and kids could be separated from the bucks. They were provided with hay and water. *Photo: Gavin Marshall.*

subsequent ferry delay in Picton also demonstrated the importance of having included transport contingency actions in the plan[2]. At the time of the muster many of the nannies were pregnant, which indicates future operations should probably be carried out earlier in the season.

- **Finance could be re-assessed/negotiated in future muster contracts.** Generally, the financial model[2] seemed good. David Hutchings was prepared to come because the monetary risk had been removed (i.e. he had no travel or accommodation costs). Further, because he was sharing in the profits of what was mustered, it incentivised him to muster well and transport the animals carefully. However, he was also paid a daily rate, which may have been excessive given that goat meat can be quite valuable ($3.50–4.00/kg processed weight), so there may be some room to negotiate the musterers' daily rate in future operations.

Hunting summary

Hunting result target

Remove all remaining feral goats between High Bare Peak and Pigeon Bay (Fig. 6).

Method

Hunting was carried out by Cam Stevenson and four other hunters (Kiwi Field Crew Ltd.) – currently New Zealand's most experienced eradication hunters. Hunting effort (Fig. 7) was broadly informed by the sector plan presented in Figure 6 which, in turn, was largely based around the results of CCC's goat sightings (Fig. 6). Highest effort was apportioned to areas where a) goats had been sighted and b) there was high bush cover and good goat habitat. However, some adaptations were made during the operation.

Kiwi Field Crew's two-step hunting strategy differed from the approach laid out in their initial operations plan[3]. Indeed, rather than conducting the entire eradication using systematic sweeps, the hunters began by first locating and eliminating all feral goat mobs that had been seen by Kenny Rose (CCC) or that had been reported by landowners (Fig. 8). The theory behind this change is that hotspot hunting, rather than systematic sweeping, is a quicker and more efficient way of removing mobs of animals that are already known about. Nonetheless, when all known goats had been removed, the team adopted systematic sweeping to ensure all locations had been checked and no animals were left (Fig. 7)[4]. The majority of hunting was carried out using indicator dogs and the team were linked with hand-held radios and coupled GPS units. GPS data was regularly analysed to ensure that hunting was efficient and that no areas were missed.

Result

Sixty-seven animals were shot in the first week of hunting (Fig. 8), which is likely to have been all the feral goats that remained after the muster operation. The hunters took particular care to ensure that all animals were killed on first contact and no escapes were reported. Three weeks were then spent systematically checking and re-checking the block and no further feral goats were found (Fig. 7).

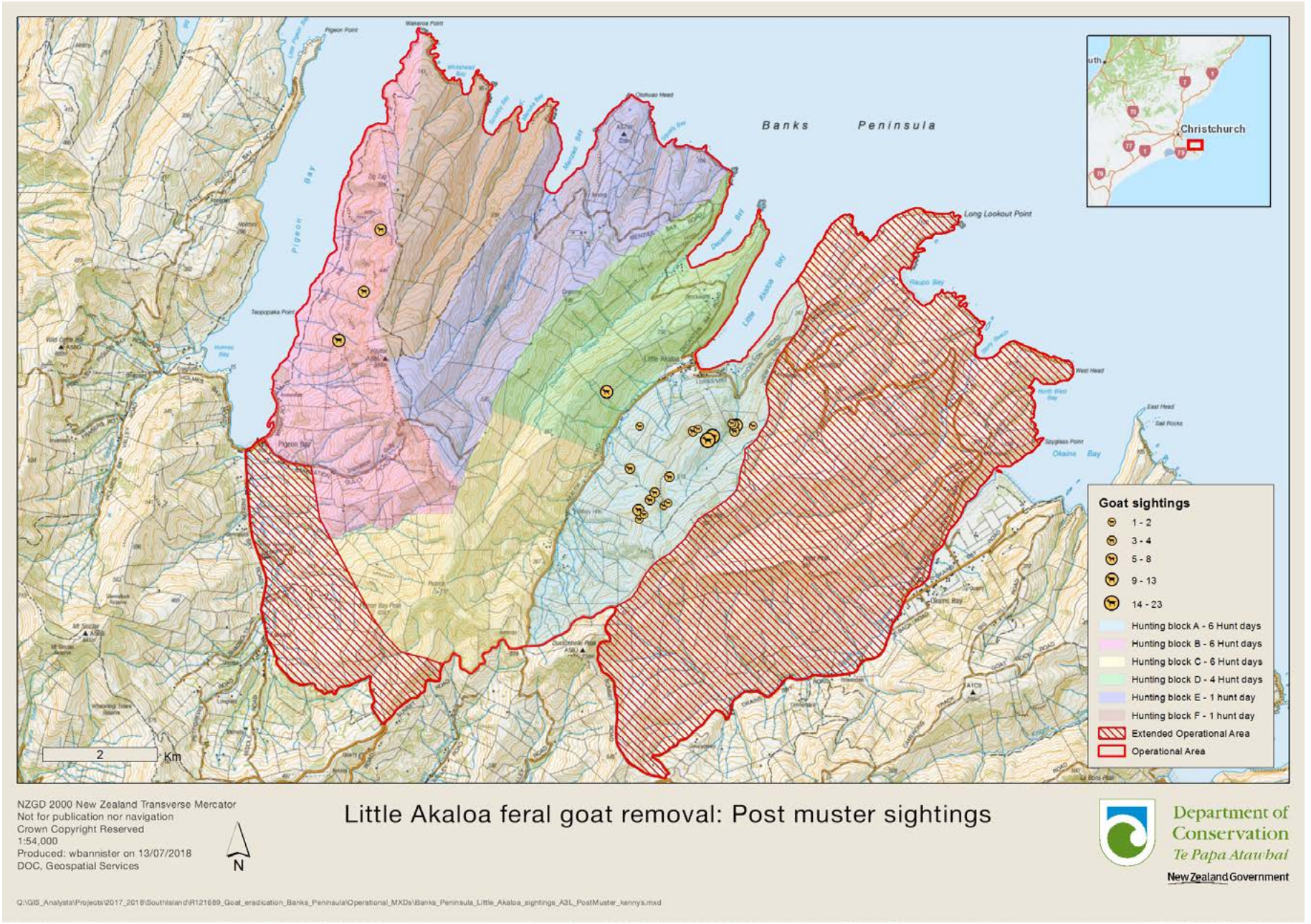

Figure 6. The planned operational units for hunting (between Pigeon Bay and High Bare Peak on the eastern boundary of the operational area) were based on results from CCC's post-muster monitoring, landowner sightings and distribution of vegetation types. *Map: Will Bannister.*

Findings and recommendations (*by Cam Stevenson, Phil Crutchley and Tom MacTavish***)**

- **Prompt Regional Pest Management Strategy (RPMS) goat farming compliance follow-up is needed at Little Akaloa.** There are three landowners with domestic goat herds in what was the operational area. One of those landowners – whose last goats contributed to the feral goats just removed – now plans to stock with more goats. Community expectation is that the new RPMS rules will prevent the problem from re-emerging.
- **Caution is necessary when using the hunting operation at Little Akaloa to inform the removal of other feral goat populations.** When they are shot at, feral goats learn to avoid hunters, which makes eradications more difficult. The goats at Little Akaloa had received little hunter pressure before the operation, which made them comparatively easy to remove. Other populations on Banks Peninsula are not likely to be so easy.
- **Budgeting and finance must continue to incorporate worst-case scenarios.** At Little Akaloa it was hoped that the operation would take 120 hunter days if everything went to plan, which it did. Nevertheless, 150 hunter days had been budgeted for, which meant there was contingency money if unexpected challenges had emerged.
- **Continue to use contractors who have feral goat eradication experience.** The experience and skill of the contract hunters greatly reduced the pressure on agency staff and meant that the operation was completed professionally and efficiently.
- **Continue to use agency staff for planning and logistics when operational budgets are low.** At Little Akaloa, agency (CCC, DOC, ECan and BPCT) staff collected intelligence on feral goats in the area, ensured landowner consent, arranged accommodation and provided maps. That meant that the contract hunters could focus 100% on locating and killing goats which, in turn, significantly reduced the cost of the operation.
- **The lead hunter should become involved in operational planning earlier.** There were differences in the way the Little Akaloa hunting operation had been planned by the agencies and the way the contractors wanted to hunt. Having the contract hunters' input from an early stage may increase efficiency and reduce confusion.
- **Prevent pest control operations from overlapping.** Coincidentally, ECan's possum contractors were poisoning and trapping around Little Akaloa at the same time as the goat hunters were working. Poison and traps are hazardous to dogs, and the possum contractors could have disturbed the hunting operations.
- **Remaining feral goat populations on Banks Peninsula should be removed as quickly as possible.** Feral goat populations are not static. The Little Akaloa population had grown and spread since the previous control operation (at least 5 years before) and all nannies checked by the hunters were pregnant. On average, feral goat numbers increase by more than 50% each year[5]. Accordingly, 302 goats in 2018 may have become 483 in 2019 and 773 in 2020 which, in turn, would have increased the cost of removing them.
- **There should be a focus on encouraging the community to have input into feral goat removal across Banks Peninsula.** At Little Akaloa the operation benefited hugely from community input. Farmers helped with logistics and planning and reported goat sightings. If the same input can be encouraged at a peninsula-wide scale, the programme will become more efficient and certainly have a better chance of success.

Monitoring and spotting results

Feral goat monitoring and spotting by Kenny Rose (CCC) provided the Little Akaloa operation with population counts and distribution estimates that informed both the muster and the hunt. One round of spotting currently involves a visit to 20 set sights for set time periods over two days. At each site binoculars and a spotting scope are used to search for and count feral goats. The sites are distributed throughout the Little Akaloa area and Kenny did three rounds

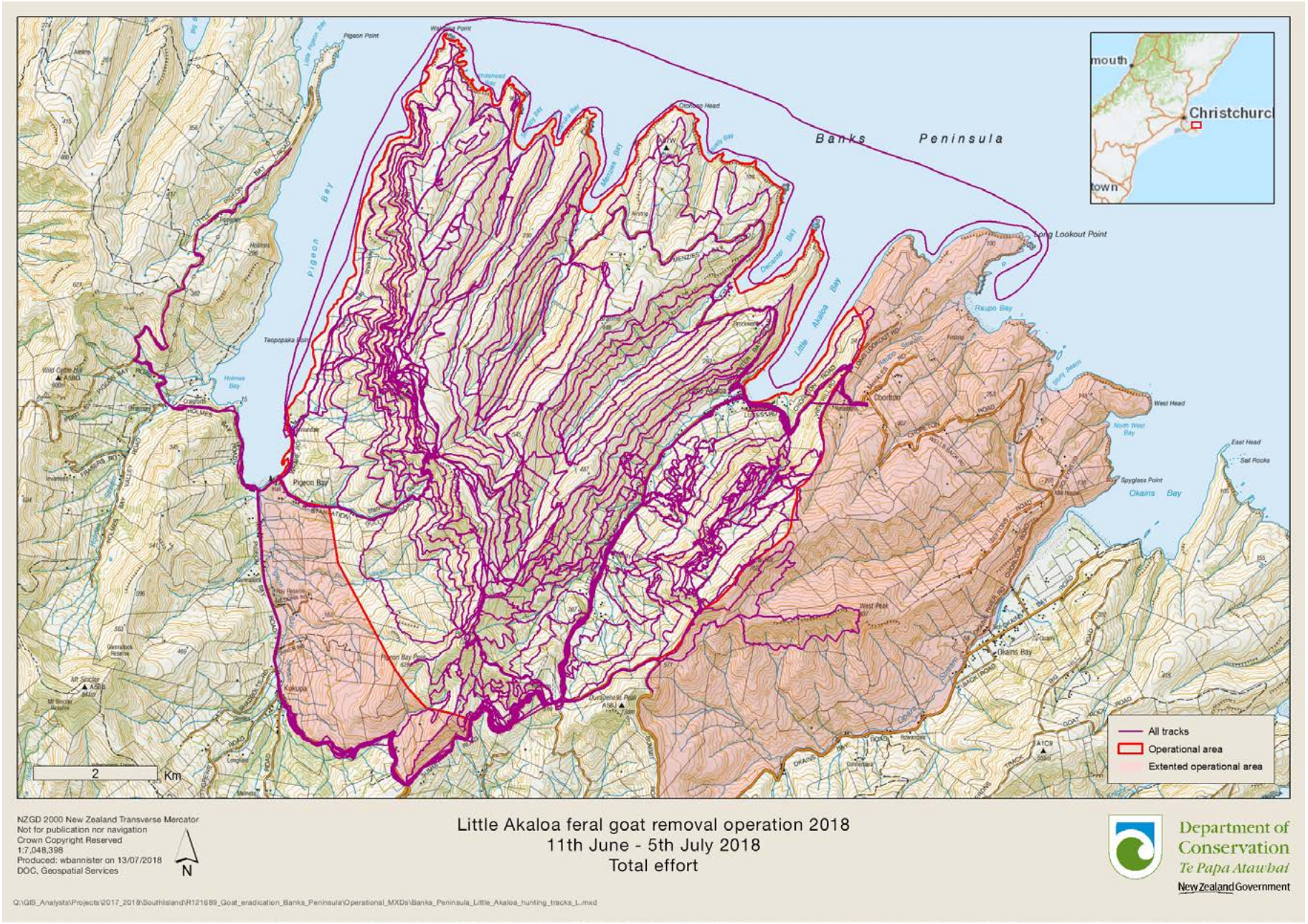

Figure 7. Map showing the hunters' total cumulative effort across the three weeks that they spent systematically sweeping the Little Akaloa goat removal area. *Map: Will Bannister.*

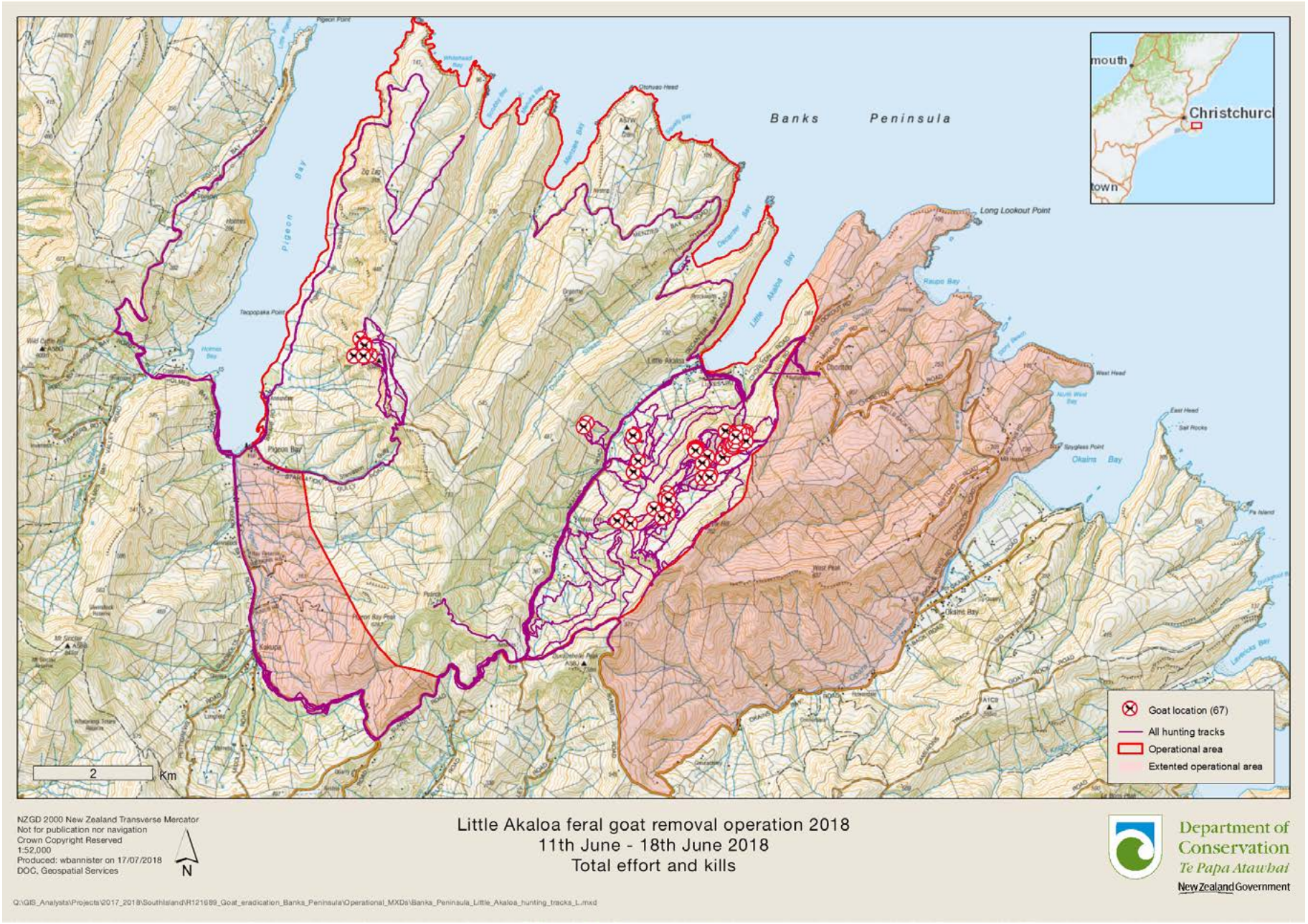

Figure 8. Map showing the cumulative effort of the hunters in week one and the locations at which the 67 goats were killed. *Map: Will Bannister.*

Figure 9. Kiwi Field Crew Ltd.'s indicator dogs ready for another day of hunting. *Photo: Tom MacTavish.*

of spotting before the operation, three after the muster and, now that the hunting has been completed, he'll finish with three more to help determine whether all goats have indeed been successfully removed.

Kenny Rose's feral goat population counts underestimated the true population size. The population before the operation was probably 302, whereas Kenny consistently counted around 140 (Fig. 10). Likewise, the population after the muster was likely 67 and Kenny consistently counted about 40 (Fig. 10). These differences between actual population size and sighted population size indicate that population counts, even from rigorous monitoring regimes, need to be at least doubled to provide reasonably accurate population estimates before any future operations.

Budget

The operation came in about $13,000 under budget (Table 1). Money was saved because 30 contingency hunter days provided for in the budget proved not to be needed. The Rod Donald Banks Peninsula Trust contributed $55,743 to the total cost, with the additional $27,000 contributed by the agencies. A full breakdown of the finances can be found in the contracts that were agreed between DOC and David R. Hutchings Ltd. and DOC and Kiwi Field Crew Ltd.[2].

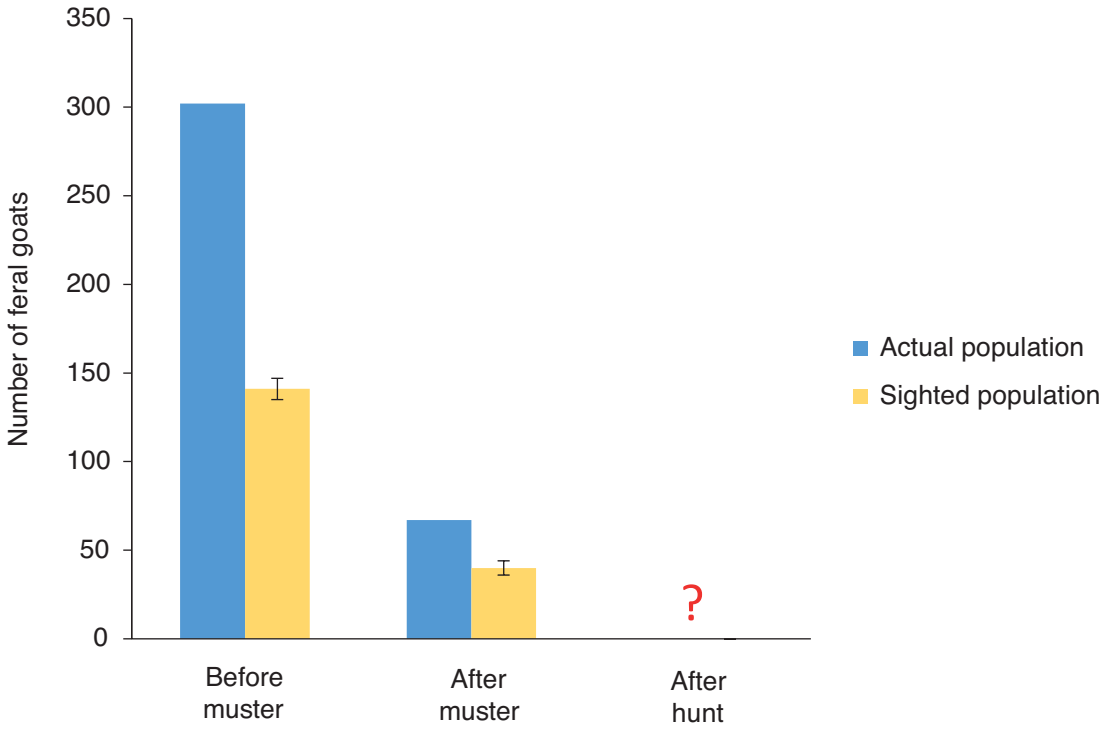

Figure 10. Actual feral goat numbers compared with sighted goat numbers before the operation and after the goat muster at Little Akaloa. Error bars show the standard error about the mean.

Table 1. 'Budgeted' cost of the Little Akaloa goat removal operation versus the 'actual cost'.

	BUDGETED COST ($)	ACTUAL COST ($)
Muster operation	12,500	12,000
Hunting operation	83,500	70,743
Operation total	96,000	**82,743**

Conclusion

Extra funding from the Rod Donald Banks Peninsula Trust made it possible for ECan, CCC, DOC and BPCT to attempt a regionally unique one-off eradication of a feral goat population centred near Little Akaloa, Banks Peninsula. The two-stage operation, which involved mustering and hunting, also involved close collaboration between farmers and agencies.

The sustained, systematic efforts of New Zealand's most experienced eradication hunters, who were used in this operation, make a compelling case that the operation has met its target of 'reducing the feral goat population centred near Little Akaloa to zero detectable density by August 2018'. However, it will require some months without feral goat sightings before the area between Pigeon Bay and High Bare Peak can safely be declared feral goat free.

The goat removal operation has generated many findings and recommendations that should help inform future feral goat removal operations on Banks Peninsula. At a broader level, it has demonstrated that pest operations on Banks Peninsula can benefit from a unified approach in which everyone – agencies, community trusts and farmers – work toward a common goal.

Acknowledgements

The operation was made possible by the financial contribution of the Rod Donald Banks Peninsula Trust and the united effort of the 2017/18 Banks Peninsula Goat Committee. Thanks also to all the landowners around Little Akaloa, but particularly Gavin & Judy Marshall, Mike & Ruth Williams and Hamish & Annabel Craw, all of whom directly contributed to the operation's planning and/or implementation.

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