Dart Caples Routeburn 5 Minute Bird Counts 2018

Introduction

Counts are carried out in October each year, there are 26 five min bird count stations in the Dart, 30 in the Routeburn and 20 in the Caples
Standard methodology is used
These counts provide an index or a measure of abundance as not all birds present will be detected.
The Five-minute bird counts are conducted in conjunction with Mohua transect surveys to enable efficiencies.

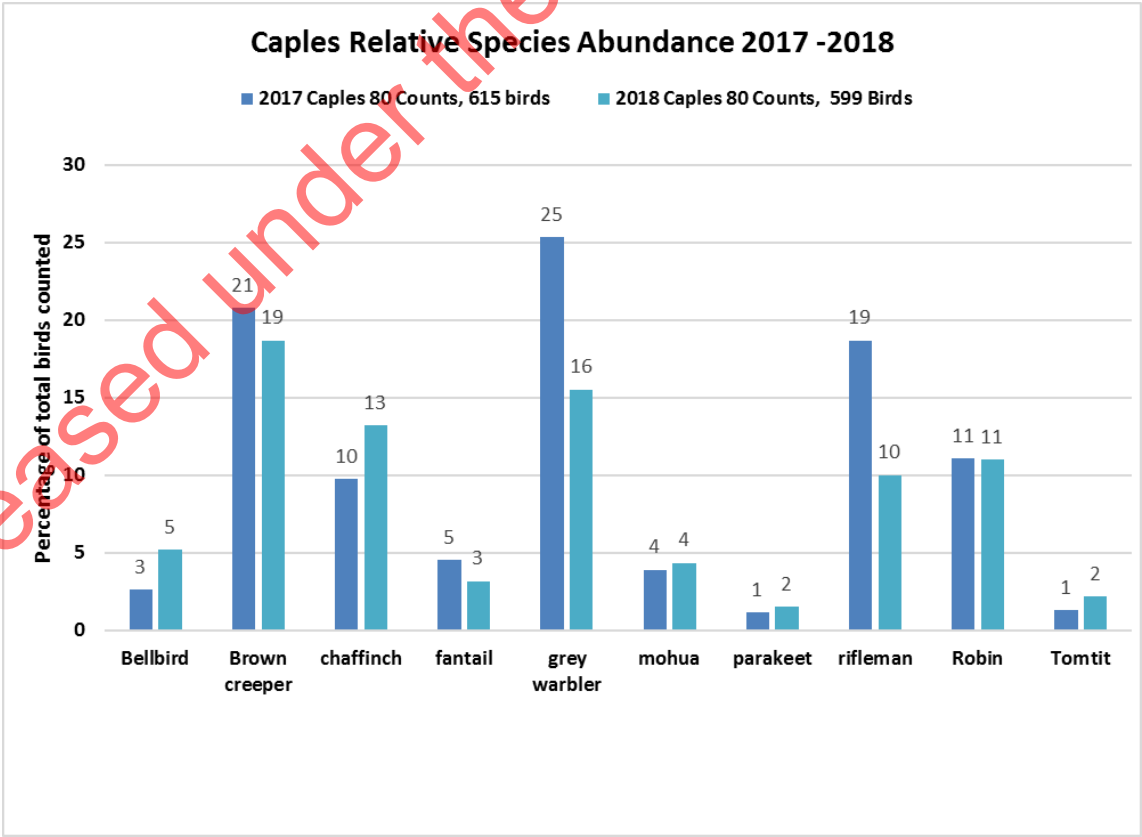
Results

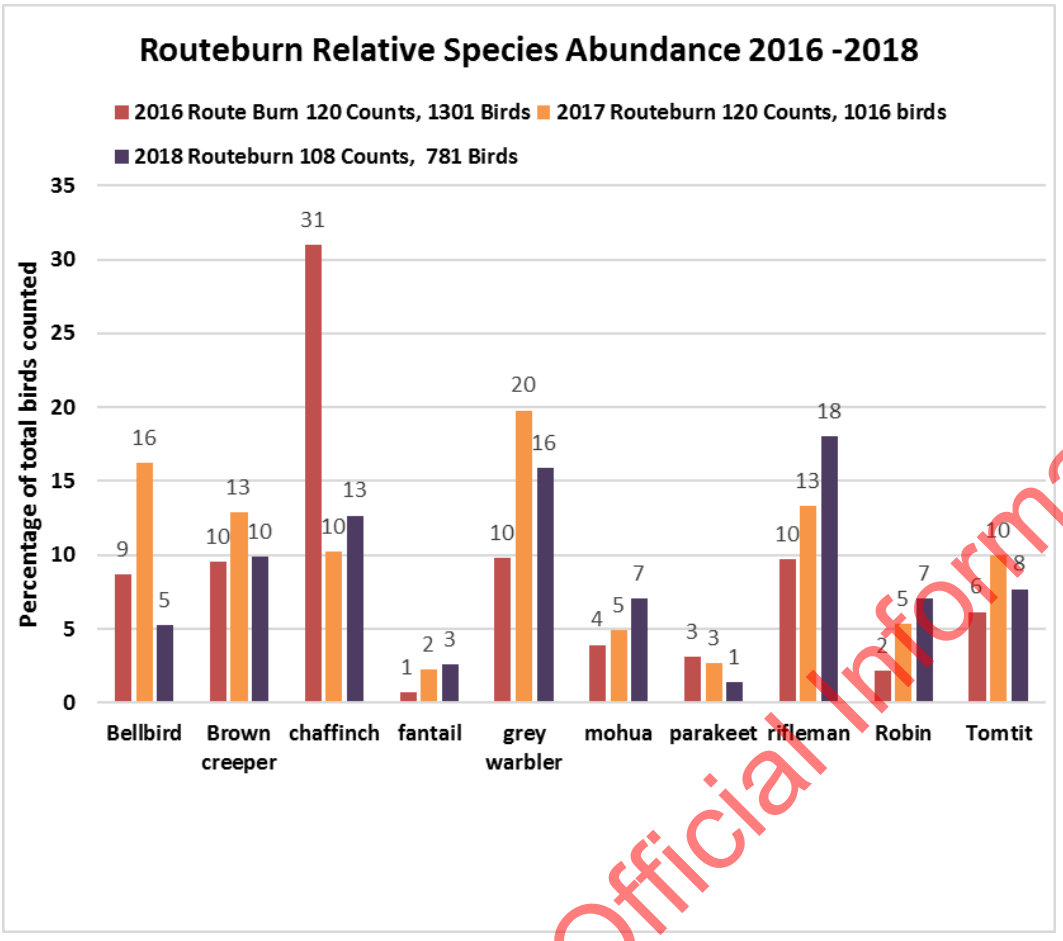
Bird numbers counted at the stations were down approx. 20% on 2017
Total bird abundance has dropped from 2016 (12 birds per 5mbc) and 2017 (9 birds per 5mbc), to 8per 5mbc in 2018; a factor of the natural fluctuations linked to Beech cycles, predation, food availability and climate.

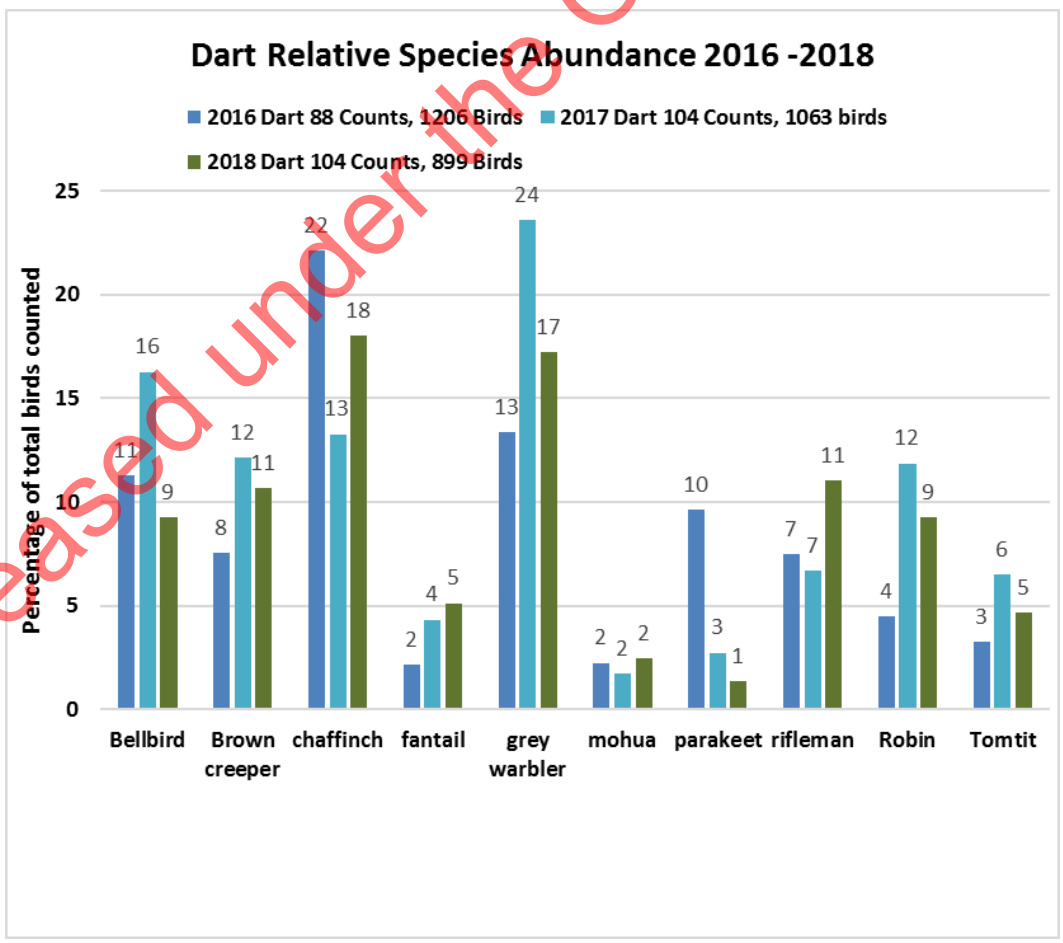
Relative Species Abundance

Of note is the drop back of the Chaffinch population which normally sits above our native species in the mean counts and abundance, in some cases Grey Warbler, Rifleman and Brown Creeper percentages have crept above Chaffinch over this 2-year period, a contributing factor is the 2 successive 1080 operations dropping the Chaffinch back, (Chaffinch are known to eat bait fragments)

The graphs demonstrate the percentages of species make up from the total counted. *Note: not all species are shown on graphs, rather ones we are more interested in.*

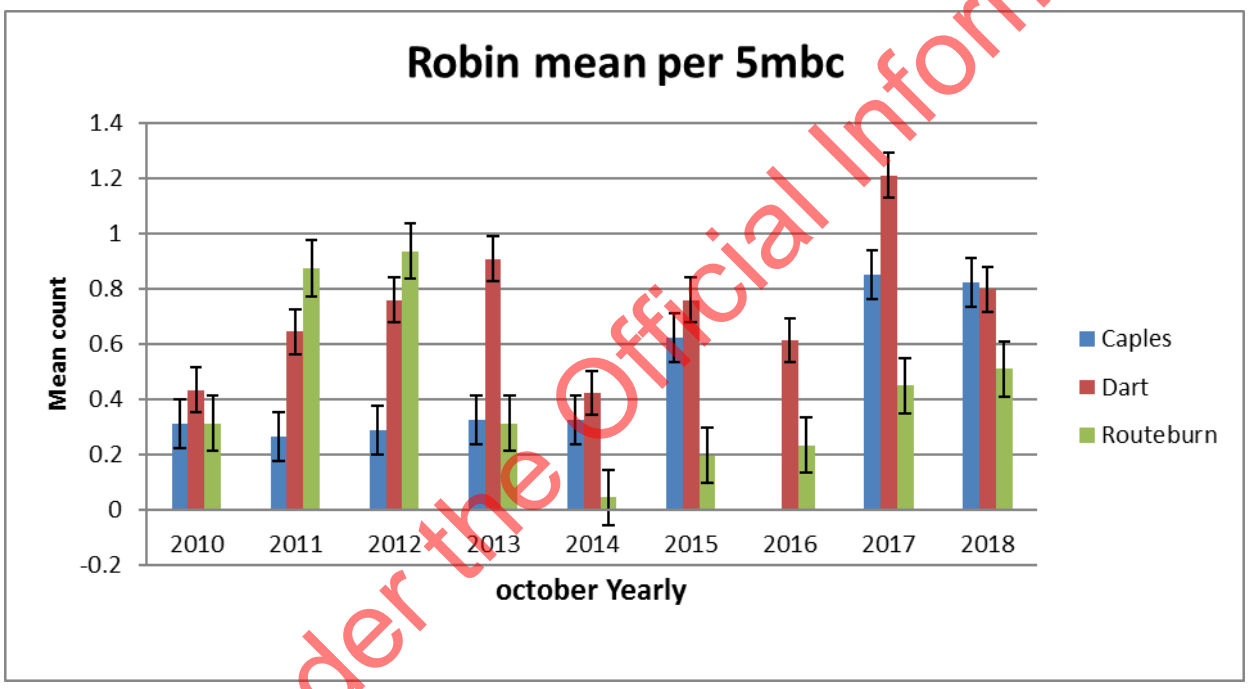


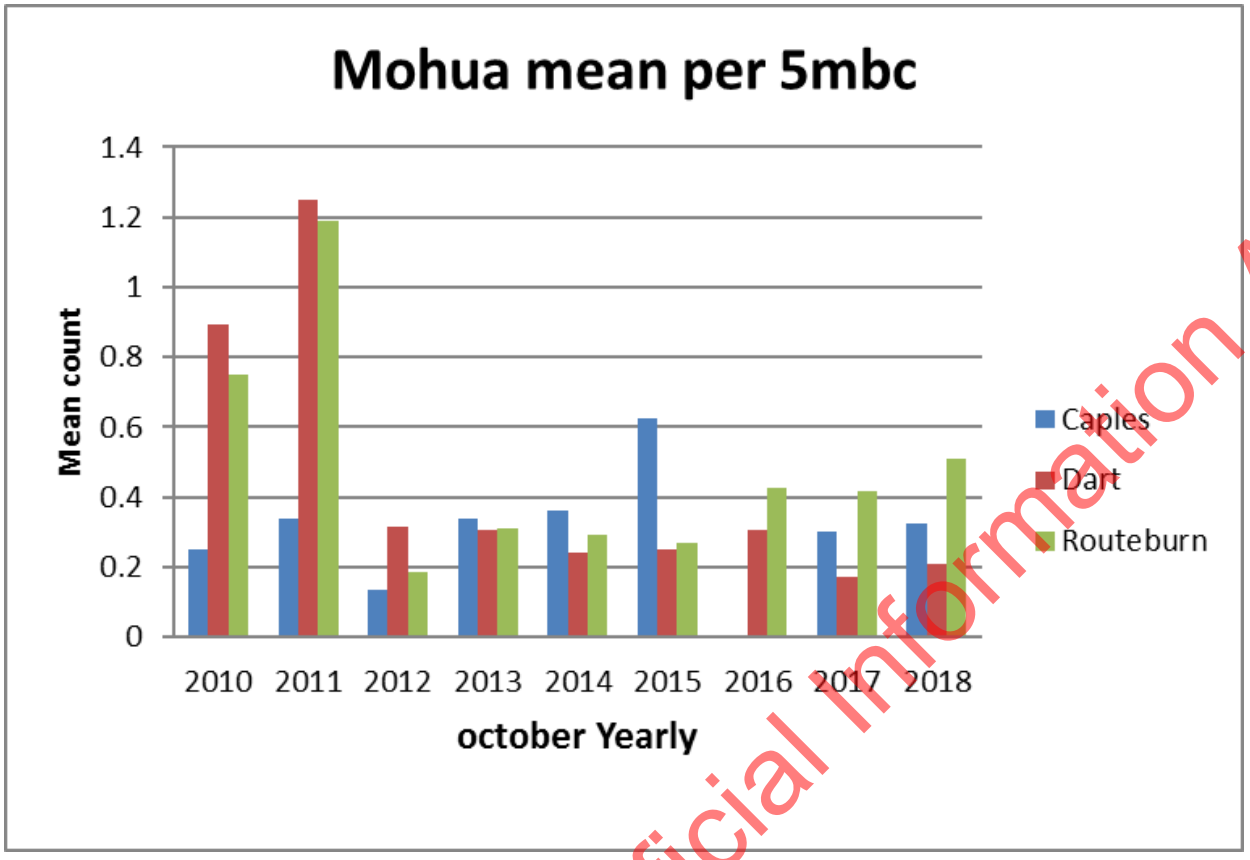


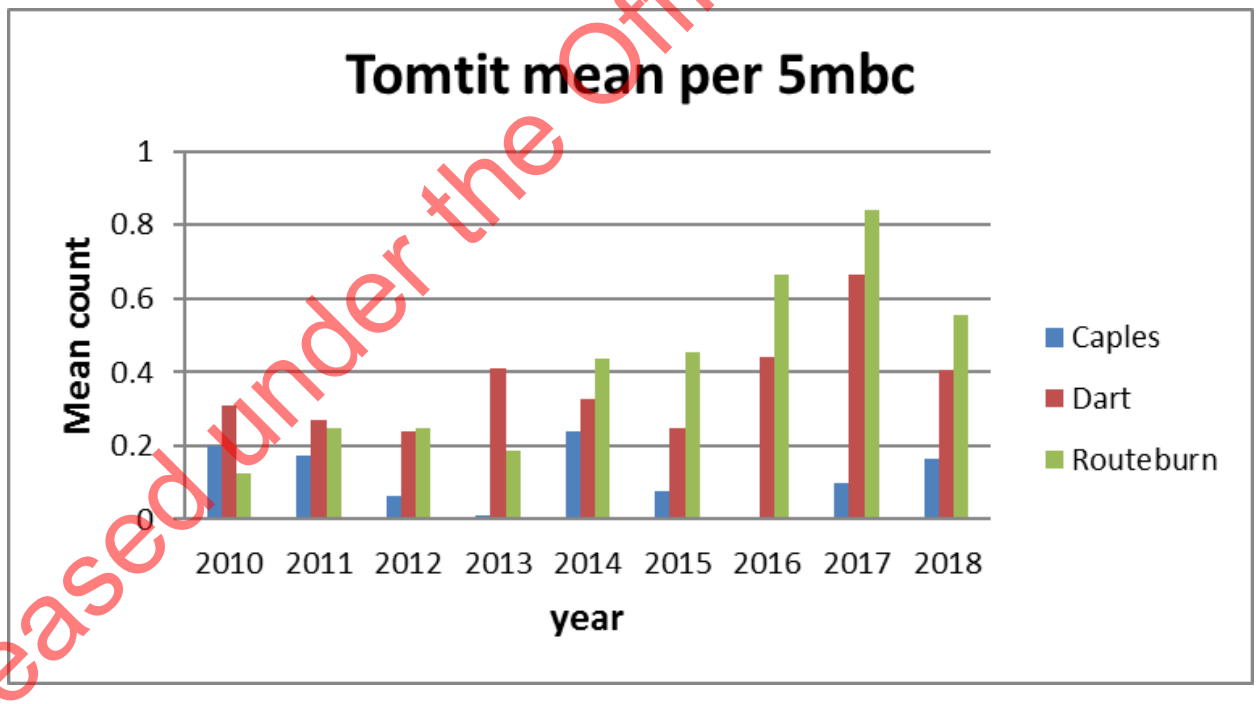


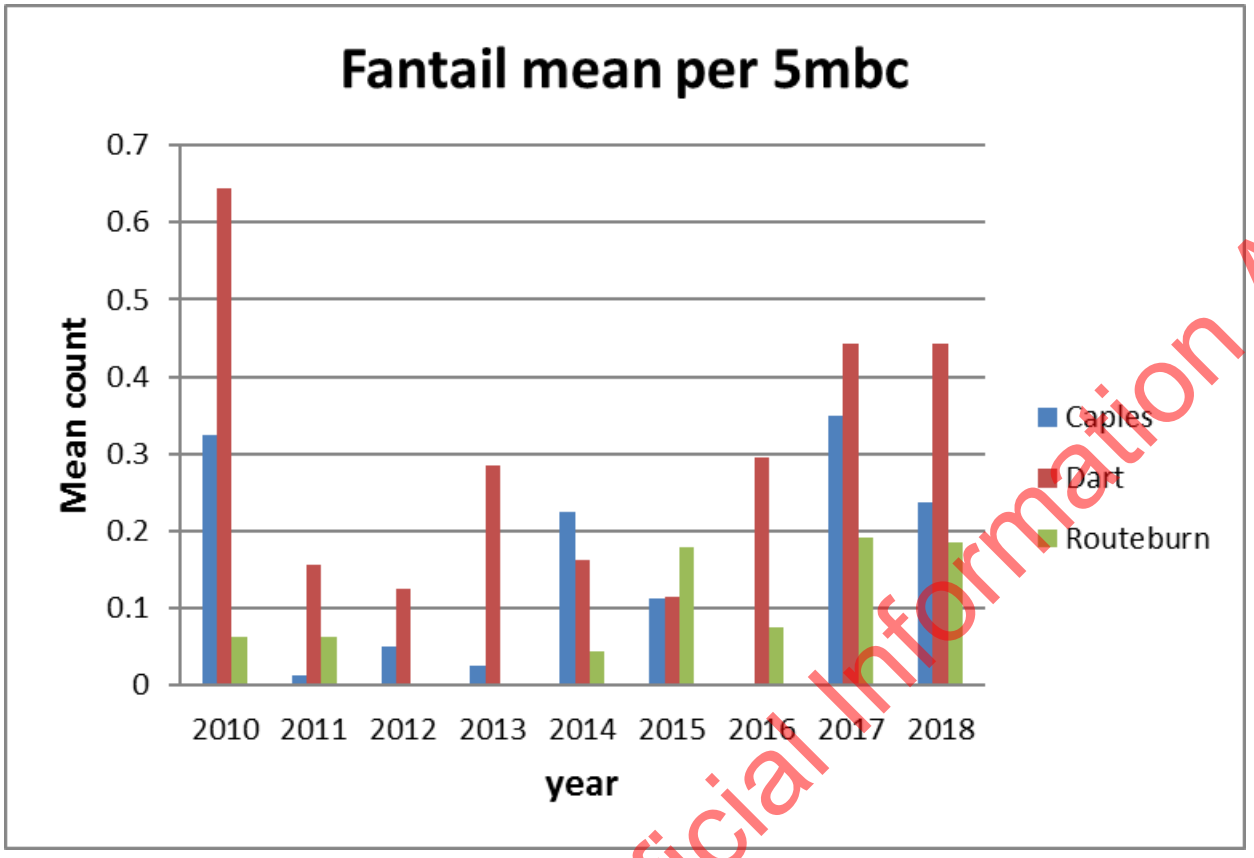
Mean counts

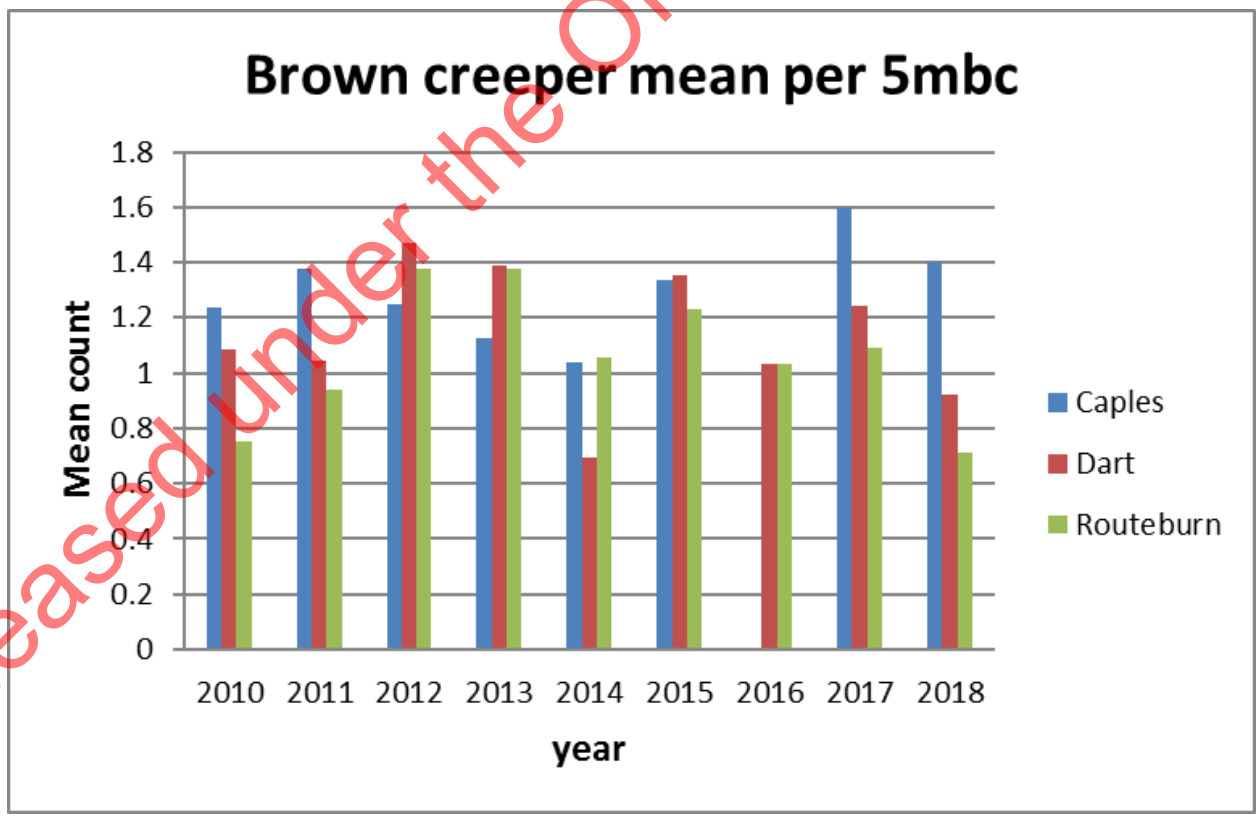
The mean is the measure used as opposed to totals of each species as the number of 5mbc stations used per year can change.
Generally, species are constant or increasing since the last full mast in 2011, species more susceptible to rodent predation show larger variances.
A full mast is again predicted for 2019.
Parakeet abundance sways wildly with food source, they respond to Beech masts with large increases in abundance, although this is short lived.
Robins have responded particularly well to 1080 operations carried out in the Dart, Caples and Routeburn. Large increases post 1080 operations of 100% to 200 have been realized in 2007, 2010, 2015 and 2017 (the year following control with 1080).

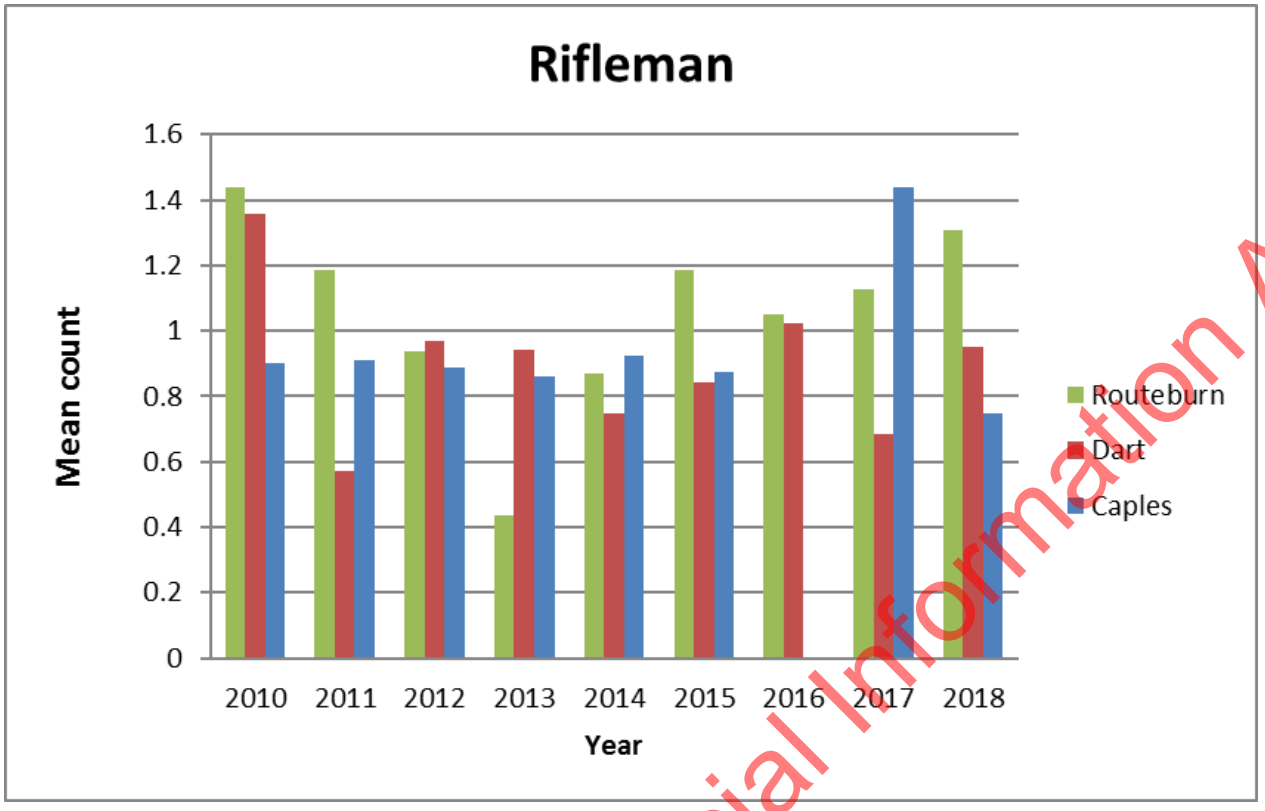


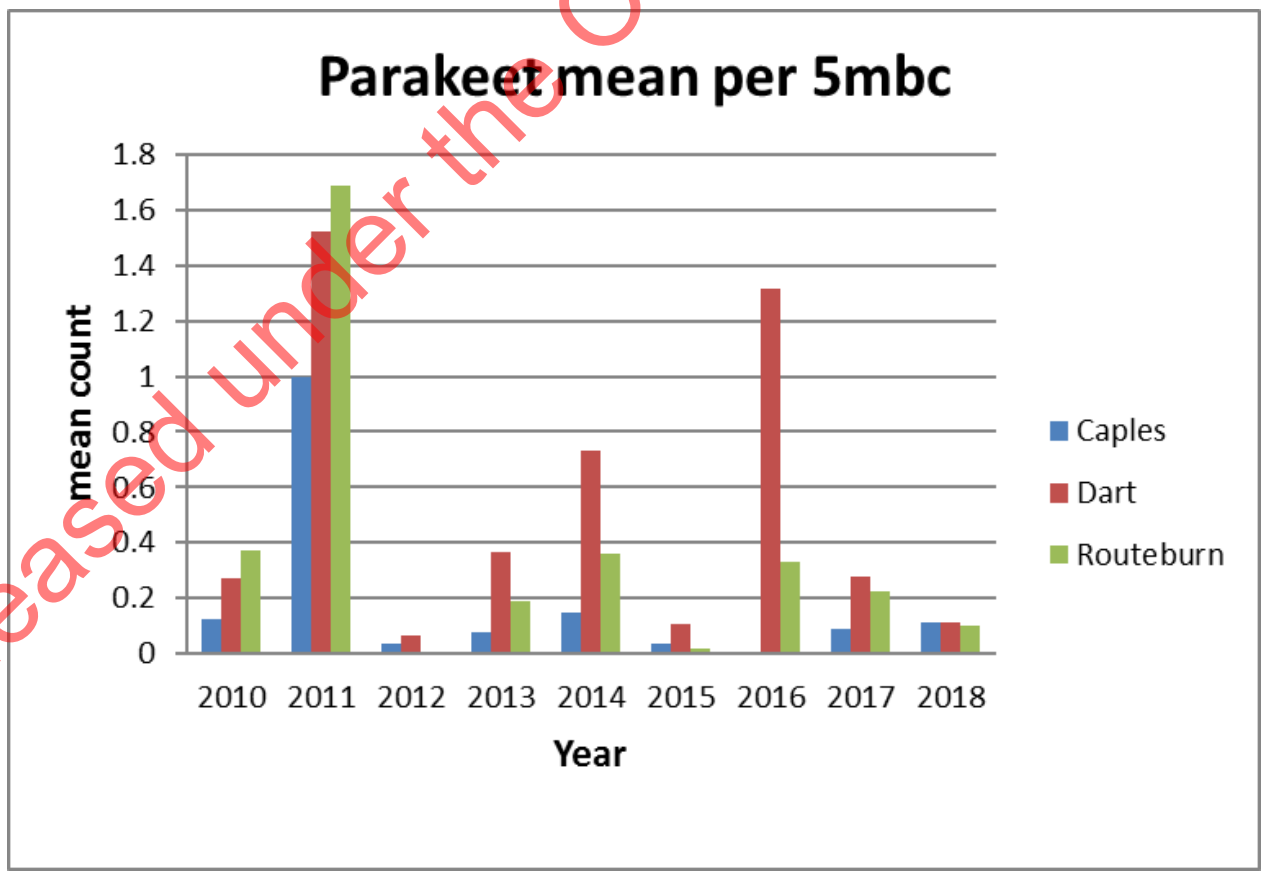












Excerpt from Assessment of Environmental Effects for Rat and Possum Control in the Dart-Routeburn-Caples Treatment Area, July 2016 –June 2021

Section 5.3 Effects of proposed operation on non-target native species

Effect on native birds

Studies carried out on native and non-native species suggests 1080 is likely to be toxic to most native animals. There is wide variation in sensitivity between taxonomic groups. Mammals are more sensitive than birds and invertebrates on a weight for weight basis. The small size of many native species relative to the target pests means that toxic baits used for pest control are capable of causing harm to almost any animal that eats the bait. Therefore, the level of exposure to the bait becomes important in determining the effects on non-target native species in the field.

There are records of a range of native bird species found dead after aerial poisoning operations and many of these individuals have contained residues of 1080. However, when records are discounted: from operations which did not meet current bait quality standards (e.g. using unscreened, un-dyed carrot bait with berry fruit lures) or from those animals which did not have detectable 1080 residues, the Department of Conservation, Vertebrate Pesticide Residue Database 1994-2008 contains only 31 individuals representing 8 native species across all bait types used in aerial poisoning. No conclusions about population effects can be drawn from this information but it is useful to focus further studies.

Eleven species of native birds have been intensively monitored, and several other bird species monitored using less precise techniques. None of these studies have identified a population level mortality that threatens the viability of the species. All 87 kiwi, 60 kāka, 19 blue ducks and 15 kereru monitored through aerial poisoning operations using radio transmitters, survived (Broome et.al, 2009).

Limited monitoring of NZ falcon, kākāriki, short tailed bats and Australasian harriers does not indicate detectable mortality due to aerial poisoning.

Risks to threatened bird species present in the treatment areas (see section 3.3) are discussed below. However, it is again important to note that most of these are not 'wetland' species that are dependent on, or associated with, wetlands above 800m in altitude. Accordingly, the aerial discharge of 1080 to regionally significant wetlands above 800m is considered to pose little or no risk to the majority of these species.

A total of 68 **weka** (*Gallirallus australis*) has been exposed to this method and bait type over 4 operations and 1 has died from poisoning.

A total of 23 radio tagged **morepork** (*Ninox novaeseelandiae*) has been exposed to this method and bait type over 5 operations and none have died from poisoning (Greene et al. 2013). Call count monitoring at Waipoua did not indicate significant 1080 related mortality (Pierce & Montgomery, 1992 cited in Broome, Fairweather & Fisher, 2009).

A total of 59 **fernbirds** (*Bowdleria punctata*) has been exposed to this method and bait type over 3 operations and 7 have disappeared after poisoning.

A total of 64 colour banded **robins (***Petroica australis*) has been exposed to this method and bait type over 2 operations and 10 have disappeared after poisoning.

A total of 29 colour banded **tomtit** (*Petroica macrocephala*) has been exposed to this method and bait type over two operations and 1 has disappeared after poisoning. A monitoring study in Tongariro using distance sampling found no significant difference in the mortality of tomtit between the treatment and non-treatment sites (Westbrooke, Etheridge & Powlesland, 2003 cited in Broome, Fairweather & Fisher 2009). This study was extended with an additional site treated with cereal pellets at 3 kg/ha at Mt Pureora in 2003. Results from all three sites led the authors to conclude that aerial poisoning operations using cereal pellets at low sowing rates causes "... ittle, if any..." short term impacts on tomtit populations (Westbrooke & Powlesland (in preparation) cited in Broome, Fairweather & Fisher 2009).

Blue duck (whio) (*Hymenolaimus malacorhynchos*) are unlikely to eat cereal pellet baits and their aquatic invertebrate prey are unlikely to be contaminated by 1080. However, studies have been done to determine their survival following aerial 1080 operations. There was no reduction in visual counts of blue duck in the Otira valley after application of 0.15% 1080 Pellets at 6 kg/ha in 1989 (Spurr & Powlesland, 1997 cited in Broome, Fairweather & Fisher 2009). Additionally, all 19 radio-tagged blue ducks in Waihaha survived for at least four weeks following aerial application of carrot bait (0.08%) at 15 kg/ha (Greene, 1998 cited in Broome, Fairweather & Fisher 2009).

A total of 60 radio tagged **kāka (***Nestor meridionalis*) have been exposed to this method and bait type over 4 operations and none have died from poisoning. Additionally, 38 radio tagged birds have been exposed to 0.08% carrot baits over 2 operations and none have died from poisoning (Greene et al. 1998; Powlesland et al. 2003).

Kereru (NZ pigeon/kūkupa) (*Hemiphaga novaeseelandiae*) have not been monitored individually when exposed to this method and bait type. However, none of six birds ate non-toxic cereal pellets offered in a trial on Kapiti island (Spurr & Powlesland, 1997). Monitoring of kereru during 5 aerial 1080 operations using cereal pellets did not detect population changes using the five minute count method (Spurr & Powlesland 1997). Additionally, all

15 radio tagged birds exposed to an aerial 1080 operation using carrot bait survived (Powlesland et al. 2003).

Kārearea (NZ falcon) (*Falco novaeseelandiae*) have not been monitored individually when exposed to this method and bait type. However falcon territories have remained occupied, presumably by the resident birds, during four aerial 1080 operations using cereal pellets (Pureora 1984, Mapara 1990-92) and one using carrot bait (Waihaha 1994) (Spurr & Powlesland, 1997). The total number of falcon involved in this monitoring is about 13, although the Mapara birds (3 pair) were exposed in three consecutive years (Calder & Deuss, 1985: Bradfield, 1993 cited in Broome, Fairweather & Fisher, 2009); Greene et al. 1998).

Kākāriki (parakeet) (*Cyanoramphus spp.*) nests have been monitored during two aerial (cereal) 1080 operations. Fifteen nests were monitored during the October 2007 Hurunui Valley operation and a further seven nests were monitored during a 1080 operation in the Dart Valley. Dead chicks in a failed nest in the Hurunui Valley operation contained 1080 residues and the female was not seen after the nest failed. All the monitored nests in the Dart Valley operation were successful, however two unmonitored kākāriki were found dead with 1080 residues in their tissues. The combined estimate of mortality of nesting parakeets from these operations was 2.27% (0.1-12 % 95% CI) (Rhodes, Elliot & Kemp, 2008 cited in Broome, Fairweather & Fisher, 2009). The authors concluded that while some kākāriki were killed during the 1080 operations, given the rate of nest predation observed in areas where no predator control was carried out, the net benefit from the 1080 operations was positive. No detectable impact could be determined through five minute bird count monitoring after four aerial 1080 operations using carrot or cereal pellet baits (Spurr & Powlesland et al. 1997). Additionally following an intensively monitored aerial 1080 operation in Waihaha in 1994 using carrot bait, (Greene et al. 1998) observed "...kākāriki remained common within the study area...".

Kāhu (Australasian harrier) (*Circus approximans*) have not been monitored individually when exposed to this method and bait type. However no detectable impact could be determined through five minute bird count monitoring before and after an aerial 1080 operation using cereal pellets on Rangitoto Island and "the small resident population was still seen...throughout the year following the poisoning" (Miller & Anderson, 1992). Additionally, (Pierce & Maloney, 1989 cited in Broome, Fairweather & Fisher, 2009) found no evidence of dead harriers after aerial 1080 poisoning of rabbits in the McKenzie basin.

A total of 145 radio tagged **kea** (*Nestor notabilis*) have been exposed to this method and bait type over 10 operations and 20 have died from poisoning in 3 of these operations. Additionally, 2 radio tagged birds have been exposed to 0.08% carrot baits over 1 operation and none have died from poisoning (Kemp & van Klink, 2008 cited in Broome, Fairweather & Fisher 2009).

Research indicates that stoats are the most important predator of kea and the impacts are most severe following mast events, which is when stoats occur in high numbers. Effective stoat control improves kea breeding success (productivity) and survival whereas unchecked stoat irruptions following mast years can drive kea productivity to near zero.

Mortality of individual birds as a result of using aerial 1080 (in those few operations where this has occurred) is therefore offset by increased productivity in the remainder of the population due to the reduction in stoat predation (resulting from secondary poisoning – see section 5.7).

Options to manage risk and/or levels of exposure:
Adopting accepted operational practices reduces the risk for birds. Techniques developed in recent years are important components of the operation. For 1080, dull-green dyed bait has been shown to be the least attractive colour to birds. Cinnamon–lured baits instead of fruit lures help to repel most birds. Ensuring bait meets all quality specifications is considered the best way to avoid adversely affecting birds.

During 2014, the DOC Pesticide Advisory Group reviewed the research results to date to recommend new compulsory performance standards. The following new standards have been approved by DOC's general management, to be applied to all new permissions for aerial 1080 operations in areas where kea are present.

The following compulsory performance standards will apply:

- Only use cinnamon lured RS5 pellets
- Use an average of 2kg/ha of prefeed bait for 12g baits (or 1kg/ha for 6g baits)
- Use an average of 2kg/ha of toxic bait for 12g baits (or 1kg/ha for 6g baits)

One previous standard has been removed, which prevented baits being sown in open areas above the treeline. Instead, the alpine boundary will be evaluated as part of the DOC permission process, to weigh up the potential risk of visible baits in open areas against the benefit of alpine predator control to protect species like rock wren.

This operation will adhere to these standards to ensure that the risk to kea is minimized to the extent that current research indicates is required.

Effect on bats

Lesser short-tailed bats (*Mystacina tuberculata*) feed on arthropod taxa that are known to consume 1080 baits. Thus, the bats may be vulnerable to secondary poisoning after control operations using aerially broadcast 1080 baits and residues in these prey can in theory be enough to kill a bat. Lloyd (1994) offered non-toxic cereal pellets containing a fluorescent marker to captive bats and hand broadcast baits throughout an area known to be inhabited by bats

and concluded "*...short-tailed bats are unlikely to eat carrot or grain-based baits...*".

In a study in Rangataua Forest where 0.15% 1080 pellets were aerially broadcast (3 – 5 kg/ha) over "*...almost the entire winter range...*" of the study animals, a total of 269 short-tailed bats were caught at their roost following poisoning and held for 48 hours to determine mortality or signs of poisoning. All animals survived and showed no signs of 1080 poisoning (Lloyd & McQueen 2002). This result compares favourably for the assessment of risk for insectivores surmised by an earlier study (Lloyd & McQueen 2000).

As noted in section 3.3 of this AEE, at altitudes above 800m bats would be more commonly using areas that are forested rather than tussock grasslands where wetlands may be present. Accordingly, bats are not likely to be adversely affected by the discharge of 1080 to regionally significant wetlands above 800m.

Effect on Invertebrates

The effect of aerial 1080 operation on common invertebrates within regionally significant wetlands will be minor.

Invertebrate populations have been monitored in several aerial 1080 poisoning operations and none have shown significant population effects on any species studied, nor is there evidence to suggest poisoned invertebrates are a significant factor in secondary poisoning of other animals. Long-term monitoring of native land snails indicates substantial benefits to threatened populations in sites treated with aerial poisoning due to reduced predator populations.

An extensive study of forest invertebrates on 1080 baits (Sherley et al. 1999) found that at any time only a small proportion of baits had invertebrates on them, and the few individuals per bait represented a small section of the fauna present in the litter. The number of invertebrates recorded on baits in treatment grids declined when 0.15% 1080 pellets were laid at 18 kg/ha, but started to return to original levels (relative to control grids) within 6 days of removal of the toxic baits. This sowing rate is approximately nine times that proposed to be used in this operational area. The reduction in invertebrate numbers did not extend further than 20cm around any bait.

Another study (Spurr & Berben, 2004 cited in Broome, Fairweather & Fisher, 2009) hand laid 0.15% 1080 cereal pellets at 5 kg/ha to simulate aerial poisoning in Tararua Forest Park in 1999 and monitored the occupancy of artificial refuges by tree weta (*Hemideina crassidens*) and cave weta (*Isoplectron sp.*). No significant impact of bait application was found for these species nor was there any effect observed on numbers of slugs, spiders and cockroaches, which also commonly used the same refuges.

No impact was detected on populations of weta in Waipoua Forest and all cockroaches, centipedes, millipedes, kauri snails and all but

	one beetle survived in enclosures with 0.08% 1080 pellets (Pierce & Montgomery et al. 1992). Spurr (1994b cited in Broome, Fairweather & Fisher, 2009) found no impacts on populations of amphipods, ants, beetles, collembolans, millipedes, mites, slugs, snails, spiders and cave weta at Puketi Forest or Titirangi Scenic Reserve where 0.08% 1080 pellets were aerially applied at 5 kg/ha. In Mapara where 0.08% 1080 pellets were aerially applied in three consecutive years (1990-92), a comparison of invertebrate fauna showed a greater number of predatory insects in the treatment site, characteristic of a healthy forest, and more fungal eating insects in the non-treatment site, characteristic of unhealthy forest (Bradfield, 1993 cited in Broome, Fairweather & Fisher, 2009).
Effect on reptiles	Reptiles are highly tolerant of 1080 (Spurr 1993). Lizards have not been monitored in any 1080 poisoning operations prior to 1994; however, none have been reported killed by 1080. Captive McCann's skinks (*Oligosoma maccanni*) ate non-toxic cereal pellets (RS5 and Agtech), especially when the baits were wet, but the level of consumption (0.01-0.02g) was probably insufficient for the animals to have received a lethal dose had the baits been toxic (Freeman, 1997).
Effect on fish and other aquatic fauna	Significant adverse effects on fish and other aquatic fauna do not occur based on the following data: • Water contamination is rarely found and extremely low level when it has occurred, • In a study conducted by NIWA (Suren & Lambert, 2006) no mortality of fish due to 1080 leaching from baits was observed • Eels have survived experimental feeding of cereal pellets and possum tissue containing 1080 (Suren & Lambert, 2004) It therefore seems unlikely that fish or benthic macro-invertebrates within the treatment area will be adversely affected. Fish are in any case unlikely to occur in wetlands above 800m (see section 3.3 of this AEE).

Section 5.3.1 Proposed consent conditions to avoid, remedy or mitigate adverse effects on non-target native species

Consent conditions for non-target native species	Ensuring 1080 bait meets all quality specifications is considered the best way to avoid adversely affecting birds and other native species 1. 1080 baits will be lured with cinnamon 2. 1080 baits will be dyed green to deter birds.

3. 1080 baits will be sown at an effective average sowing rate not greater than 2 kg/ha.

4. RS5 baits will be used.

In addition, the following conditions are proposed:

5. The aircraft will have global positioning system ('GPS') guidance equipment to map and control the bait spread. This equipment will:
   - allow highly accurate bait placement on all parts of the operational area;
   - display exclusion zone boundaries; and
   - monitor application rates to ensure that they are within the correct range

6. The pilot of any aircraft used to discharge 1080 must hold a current GrowsafeTM Agrichemical Pilots Rating Certificate or equivalent alternative certification.

Annual General Meeting – an invitation to Members

The 150th Annual General Meeting of SBS Bank (Southland Building Society) will be held at **2:30pm** on **Wednesday 17 July** on the 6th floor of the Kelvin Hotel, Invercargill. Afternoon tea will follow the meeting.

We extend a warm welcome to all our Members to join us.

sbsbank

Predator Control in the Dart, Routeburn and Caples Valleys

Department of Conservation
Te Papa Atawbai

THE PUBLIC ARE ADVISED that from **Thursday 1 August 2019**, the Department of Conservation intends to aerially apply cereal baits containing the pesticide sodium fluoroacetate (1080) over public conservation land in the Dart, Routeburn and Caples Valleys.

The poison will be used to control the numbers of rodents, stoats and possums. These introduced pests are threatening the viability of many populations of native birds such as the mohua (yellowhead), and whio (blue duck).

Description of the Area

The treatment area is approx. 19,400 ha – encompassing the Dart Valley, Caples Valley, Beans Burn, Rock Burn, Lake Sylvan, Routeburn North Branch and Routeburn.

Method of Control

Cereal baits containing the pesticide will be sown by helicopter. The baits are cylindrical pellets approx. 3cm long, 2cm wide and weighing 6g. Each pellet contains 0.15% biodegradable 1080. The baits will be coated with deer repellent that turns the usually green bait to a brownish-green colour. The sowing rate is 1.5kg of baits per ha. The operation is managed by Geoff Owen, Operations Manager Wakatipu District Department of Conservation, 1 Arthurs Point Road, Queenstown 9371, tel: 03 442 7933.

Precautions

This pesticide is poisonous to humans and domestic animals. Always remember:

- **DO NOT** touch or eat the bait
- **WATCH CHILDREN** at all times
- **DO NOT EAT** animals from this area
- **DO NOT** allow **DOGS** access to animal carcasses

Observe these rules whenever you see warning signs placed at public access ways in the above areas. When these signs are removed you can resume normal activities.

Temporary Closure of Operations Area

During the predator control operation the Dan's Paddock Conservation Area and parts of the Lower Dart Conservation Area will be temporarily closed by the Director-General of Conservation to public entry for reasons of public safety. Unauthorised persons who enter the operations area while it is temporarily closed may be trespassed for the period of the predator control operation.

Map of the Treatment Area

A detailed map of the treatment area in the Dart, Routeburn and Caples Valleys may be viewed at the Queenstown DOC Visitor Centre (50 Stanley St, Queenstown) between 8:30am and 4:30pm or by following the link for Otago at https://www.doc.govt.nz/nature/pests-and-threats/pesticide-summaries/

For detailed information call the DOC Queenstown administration office on (03) 442 7933 or email bfobwakatipu@doc.govt.nz