

Operational Plan for the eradication of stoat *Mustela erminea* from Orkney Mainland and linked isles, Scotland



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Funding raised by
The National Lottery
and awarded by the Heritage Lottery Fund



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Version History:

VERSION	DATE	AUTHOR	REASON FOR CHANGE
1.0	31.5.2018	Laura Bambini	N/A
2.0	6.6.2018	Laura Bambini	TAG review
3.0	30.7.2018	Laura Bambini	Final version with all sections completed

Citation:

This report should be cited as:

Bambini, L., Sankey, S. and Neville, G. 2018. Orkney Native Wildlife Project: Stoat Eradication Operational Plan. RSPB Scotland unpublished report. 79 Pp.

Executive Summary

The purpose of this document is to provide a detailed description of the stoat eradication operation across Orkney Mainland, South Ronaldsay, Burray, Glimps Holm, Lamb Holm and Hunda, and the biosecurity activities delivered on the non-linked islands of the archipelago. The Orkney stoat eradication will be the largest of its kind ever attempted, in terms of the land area targeted. It will also be the world's largest eradication operation carried out on an inhabited island. Around 20 of the Orkney Islands are inhabited, with a total population of around 21,000 people.

A community consultation carried out by the ONWP in 2018 indicated that there is significant support from Orcadians for the eradication (ONWP, 2018), and all the land-owners the project has so far contacted have granted permission to trap stoats on their land. This Operational Plan is based on the findings of a feasibility assessment carried out in 2016 (Harper, 2017a), and is informed by an Operational Plan developed by Bell *et al.* (2018).

The primary objective of this eradication operation is to remove the predation pressure posed by the invasive non-native stoat on the Orkney native wildlife. Due to the challenges faced by any stoat eradication, arising from the intrinsic qualities of the target species, and specifically by this operation due to its unprecedented scale both in terms of the land area targeted, and the size of the human population inhabiting the islands, this operation will be subject to active adaptive management. Through a bi-annual operational review process and adaptive management, new research and learning can be incorporated in the operational planning to improve efficiencies, and new eradication techniques can be tested as they become available. The operational review process will track the progress of the operation, and assess whether the operational goal and objectives, as detailed below, remain feasible and attainable.

This eradication operation will be delivered using the humane DOC150 and DOC200 traps, in a single- or double-set configuration placed in an extended “weka”-design wooded tunnel built to the manufacturer specifications (see Annex III.), as permitted by the Spring Traps Approval (Scotland) Order (STAO) 2011 (as amended), with baffles fitted at either end of the housing tunnel, and additional internal baffles in place to direct the animal to a correct position on the kill-plate to ensure a humane and effective kill. Additionally, self-resetting Goodnature A24 traps will be used. Conservation indicator dogs will be used extensively to assist in the mop-up stage of the eradication, and biosecurity of the non-linked and stoat-free islands of the archipelago.

This eradication operation will be supported by a monitoring programme, which will collect data on stoat abundance using tracking tunnels and motion-triggered trail cameras operated by citizen scientists and volunteers. Orkney's native wildlife will also be monitored by volunteer citizen scientists, and seasonal research assistants will collect wader and hen harrier productivity data to gather evidence on the conservation impact of the stoat removal in Orkney. The details of this monitoring programme are not included in this Operational Plan, but are provided in the Project Plan.

This eradication will be delivered by the Orkney Native Wildlife Project (ONWP) partnership, formed by the Royal Society for the Protection of Birds (RSPB), Scottish Natural Heritage (SNH) and the Orkney Islands Council (OIC). This project has received a generous grant from EU LIFE (LIFE17 NAT/UK/557), and financial contributions from the partners.

NOTE: *This Operational Plan is subject to periodic reviews and may require changes as part of the adaptive management process. Any changes to this Operational Plan will be clearly marked as such. Please ensure that you are referring to the most up to date version of this Plan.*

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1 INTRODUCTION

The purpose of this document is to provide a detailed description of the stoat eradication operation across Orkney Mainland, South Ronaldsay, Burray, Glimps Holm, Lamb Holm and Hunda. This eradication will be delivered by the Orkney Native Wildlife Project (ONWP) partnership, formed by the Royal Society for the Protection of Birds (RSPB), Scottish Natural Heritage (SNH) and the Orkney Islands Council (OIC). The project is funded by generous grants received from the Heritage Lottery Fund, EU LIFE, and in-kind and cash contributions from the project partners. For more detail on the background to the project, project governance, communication strategy, team structure and other supporting information, please refer to the Project Plan (Bambini *et al.* 2018).

The Orkney stoat eradication will be the largest of its kind ever attempted, in terms of the land area targeted. It will also be the world's largest eradication operation carried out on an inhabited island. Around 20 of the Orkney Islands are inhabited, with a total population of around 21,000 people. A community consultation carried out by the ONWP in 2018 indicated that there is significant support from Orcadians for the eradication (ONWP, 2018), and all the land-owners the project has so far contacted have granted permission to trap stoats on their land.

This Operational Plan is based on the findings of a feasibility assessment carried out in 2016 (Harper, 2017a), and is informed by an Operational Plan developed by Bell *et al.* (2018). In May 2018, the project's Technical Advisory Group (TAG) rejected the Bell *et al.* 2018 Plan on technical grounds and as being financially unfeasible to implement (TAG, 2018). The TAG recommended that a new Operational Plan be produced, taking on board and incorporating specific recommendations from Bell *et al.* 2018. A summary of these recommendations is provided in Annex I of this plan.

In producing this plan, the authors have consulted widely with UK and global experts in stoat ecology, eradications and wildlife management. The New Zealand Department of Conservation has been particularly helpful. The project TAG has provided guidance in the development of this plan, and has approved the final version of this plan. On the request of the project team, the TAG approved Operational Plan will also be reviewed by the New Zealand-based Island Eradications Advisory Group (IEAG) in August 2019.

This eradication operation will be subject to active adaptive management, with a 6-monthly technical review process built into this operational plan. Full details of the adaptive management process are provided in the Project Plan (Bambini *et al.* 2018), with a summary provided in Annex II of this operational plan. This Operational Plan is subject to periodic revisions to reflect the changes that are implemented through the adaptive management process, or may arise from e.g. legislative changes, changing community consents, or new eradication tools and techniques that may become available during the Orkney stoat eradication. Following any significant change to this Operational Plan, it is recommended that the following are considered: *Is the eradication still technically feasible? Are the outcomes sustainable? Do the benefits still outweigh the costs?*

1.1 The Site: Orkney Mainland and linked islands of Burray, South Ronaldsay, Lamb Holm, Glimps Holm and Hunda

The Orkney archipelago (Figure 1.) in the UK is a group of around 70 islands (Table 1.), situated approximately 10 km at their closest point from the north coast of Scotland. The climate is mild and wet, with frequent and strong gales in winter. The average temperatures are around 15 °C in summer and 5 °C in winter. The 21,000 Orcadians live across 20 or so islands, although some islands are only occupied during the summer months. The islands are mostly low-lying, with the highest peak (Ward Hill, on Hoy) rising to 479 metres. Most people live on Orkney Mainland and the islands of Burray and South

Ronaldsay which are connected by bridges or isthmuses (and are collectively known as the 'linked isles', including the much smaller and uninhabited Lamb Holm, Glimps Holm and Hunda), and have a total population of 18,480.

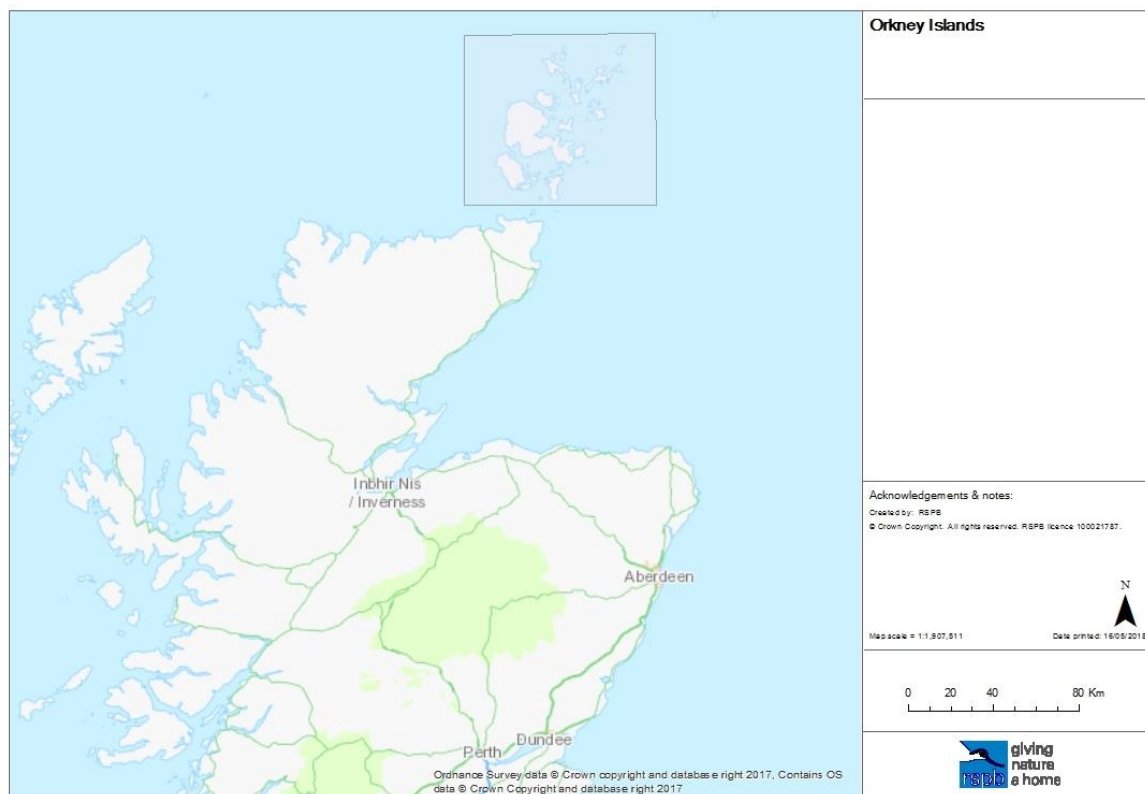


Figure 1. Orkney Islands in Scotland, UK.

Table 1. Key information on the major islands in the Orkney group (adapted from Bell *et al.* 2018).

Island	Island grouping	Size (ha)	Elevation (m)	Distance from nearest neighbouring island (km)	Invasive mammals present	Residents
Auskerry		85	18	3.8 (Stronsay)	Possibly house mouse	4
Brough of Birsay	Mainland and linked isles	16	42	0.2 (Mainland)	Unknown	0
Burray	Mainland and linked isles	903	80	Connected by bridge	Stoat, rat, hedgehog, rabbit, feral cat, house mouse	409
Calf of Eday	North Isles	243	54	0.4 (Eday)	Free of invasive mammals	0
Calf of Flotta	South Isles	16	16	0.3 (Flotta)	Probable rat	0
Cava	South Isles	107	38	1.9 (Hoy)	Free of invasive mammals	0
Copinsay	South Isles	73	70	1.8 (Mainland)	Rabbit, house mouse (wood mouse)	0
Damsay	North Isles	18	11	0.7 (Mainland)	Free of invasive mammals	0
Eday	North Isles	2,745	101	2.0 (Sanday)	Rat, hedgehog, rabbit, feral cat, house mouse (wood mouse)	160
Egilsay	North Isles	650	35	1.5 (Rousay)	Rat, hedgehog, rabbit, feral cat, house mouse	26
Eynhallow	North Isles	75	30	0.8 (Rousay) 1.0 (Mainland)	Free of invasive mammals	0
Fara	South Isles	295	43	0.5 (Flotta) 0.9 (Hoy)	Probable rat, rabbit	0
Faray	North Isles	180	32	1.3 (Eday)	Probable house mouse	0

Island	Island grouping	Size (ha)	Elevation (m)	Distance from nearest neighbouring island (km)	Invasive mammals present	Residents
Flotta	South Isles	876	58	0.5 (Flotta) 1.5 (Hoy) 2.4 (South Ronaldsay)	Rat, hedgehog, rabbit, feral cat, house mouse	80
Gairsay	North Isles	240	102	0.9 (Mainland)	Rat, rabbit, feral cat	3
Glimps Holm	Mainland and linked isles	55	32	Connected by bridge	Stoat, hedgehog, probable rat, rabbit, feral cat, house mouse	0
Graemsay	South Isles	409	62	0.9 (Hoy) 1.0 (Mainland)	Probable rat, feral cat, hedgehog, rabbit, house mouse (wood mouse)	28
Helliar Holm	North Isles	35	28	0.4 (Shapinsay) 0.9 (Mainland)	Unknown	0
Holm of Faray	North Isles	27	19	0.2 (Faray)	Unknown	0
Holm of Grimbister	North Isles	16	8	0.2 (Mainland)	Unknown	3
Holm of Huip	North Isles	24	18	0.6 (Stronsay)	Probable rat	0
Holm of Papa	North Isles	21	15	0.7 (Papa Westray)	Unknown	0
Holm of Stockness	North Isles	22	18	0.3 (Egilsay) 0.5 (Rousay)	Probable rat	0
Hoy	South Isles	13,468	479	0.9 (Graemsay) 2.6 (Mainland)	Possible stoat, rat, feral cat, hedgehog, rabbit, house mouse (wood mouse)	419
Hunda	Mainland and linked isles	100	41	Connected by bridge	Stoat, rat, hedgehog, rabbit, feral cat, house mouse	0
Inner Holm	South Isles	2	7	0.1 (Mainland)	Unknown	0

Island	Island grouping	Size (ha)	Elevation (m)	Distance from nearest neighbouring island (km)	Invasive mammals present	Residents
Lamb Holm	Mainland and linked isles	40	20	Connected by bridge	Stoat, rat, hedgehog, rabbit, feral cat, house mouse (wood mouse)	0
Linga Holm	North Isles	57	18	0.7 (Stronsay)	Probable rat, rabbit	0
Muckle Green Holm	North Isles	28	28	2.1 (Eday)	Free from invasive mammals	0
Muckle Skerry	Pentland Firth islands	34	20	4.6 (South Ronaldsay)	Free from invasive mammals	0
North Ronaldsay	North Isles	690	23	3.8 (Sanday)	Hedgehog, rabbit, feral cat, house mouse (wood mouse)	72
Orkney Mainland	Mainland and linked isles	52,320	271	1.2 (Rousay) 1.7 (Shapinsay) 2.6 (Hoy)	Stoat, rat, hedgehog, rabbit, feral cat, house mouse	17,162
Papa Stronsay	North Isles	74	13	0.3 (Stronsay)	Probable rat and feral cat, possible hedgehog	0
Papa Westray	North Isles	918	48	1.8 (Westray)	Rabbit, house mouse, probable rat, possible feral cat	90
Rousay	North Isles	4,860	250	1.3 (Mainland)	Possible stoat, rat, rabbit, feral cat, house mouse	216
Rysa Little	South Isles	33	20	0.3 (Hoy)	Probable rat	0
Sanday	North Isles	5,043	65	2.0 (Eday)	Rat, rabbit, feral cat, house mouse (wood mouse)	494

Island	Island grouping	Size (ha)	Elevation (m)	Distance from nearest neighbouring island (km)	Invasive mammals present	Residents
Shapinsay	North Isles	2,948	64	1.5 (Mainland)	Hedgehog, feral cat, probable rat, rabbit, house mouse (wood mouse)	307
South Ronaldsay	Mainland and linked isles	4,980	118	Connected by bridge	Stoat, rat, hedgehog, rabbit, feral cat, house mouse (wood mouse)	909
South Walls	South Isles	1,100	57	Connected (to Hoy) by bridge	Rat, feral cat, hedgehog, rabbit, house mouse(wood mouse)	See Hoy
Start Point	North Isles	24	8	0.6 (Sanday)	Unknown	0
Stronsay	North Isles	3,275	44	3.5 (Eday)	Rat, feral cat, hedgehog, rabbit, house mouse (wood mouse)	349
Sweyn Holm	North Isles	17	15	0.2 (Gairsay)	Probable rat	0
Switha	South Isles	41	29	1.2 (Flotta) 1.3 (South Walls)	Probable rat	0
Swona	Pentland Firth islands	92	41	3.3 (South Ronaldsay)	Possible rat, rabbit, house mouse, feral cattle	0
Westray	North Isles	4,713	169	7.0 (Rousay)	Feral cat, hedgehog, rabbit, house mouse	588
Wyre	North Isles	311	32	0.7 (Rousay) 2.2 (Mainland)	Rat, feral cat, hedgehog, rabbit, house mouse	0

The largest settlements are Kirkwall, with a population of around 9,000 people, and Stromness with 2,000 residents. The combined land area of Orkney Mainland and linked isles is 58,398 ha.

The Orkney Islands have high cultural and natural heritage value, and much of the land area is designated for nature conservation or for the protection of historical or archaeological sites (Figure 2.). The islands receive tens of thousands of visitors and tourists every year.

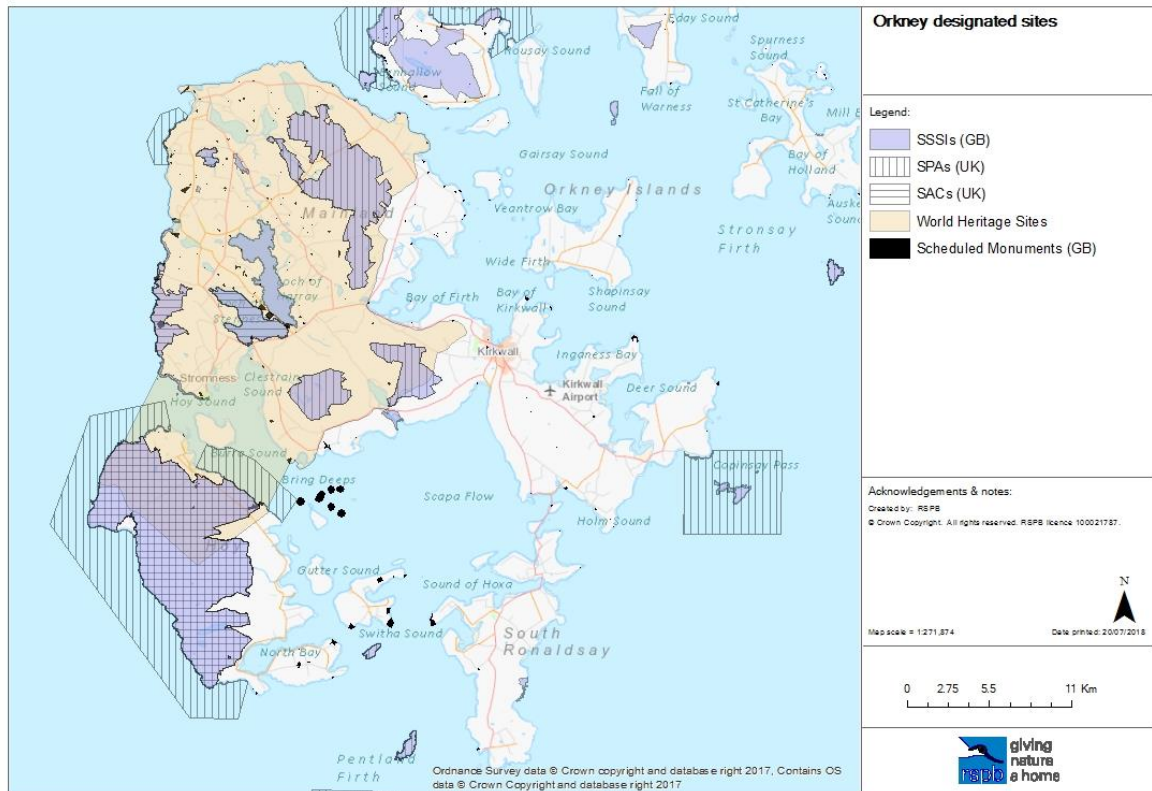


Figure 2. Designated sites of the southern Orkney Islands, including the Mainland and linked isles.

1.2 Target Species: stoat *Mustela erminea*

The stoat *Mustela erminea* is native to the British Isles and occurs on mainland UK and across the larger islands, including Shetland where it is introduced, but is absent from the Western Isles and [until recently] Orkney (King, 1977). The stoat is relatively common in the UK (Battersby & Tracking Mammals Partnership, 2005). The stoat is sexually dimorphic, with males being larger than the females, but with large variation in body size across its range in the Holarctic. Stoat body size is thought to vary as an adaptation to the size of locally available prey (Erlinge, 1987; Powell and King, 1997). In Britain, male body length ranges between 275-312 mm and weight 200-445 g, and females have a body length between 242-292 mm and weigh 140-280 g, with a tail length of 95-140 mm. Stoats have a short lifespan, usually 1 – 1.5 years, with maximum age in the wild reported as 7 years, and a population turnover rate of 3-5 years (King, 1977).

Stoats are not native to the Orkney archipelago where they are a recent introduction. First reports of stoats on Orkney Mainland were received in 2010, and the population has since expanded rapidly.

Harper (2017a) speculated that stoats in Orkney might already be at carrying capacity, and that it was highly likely that they would be dispersing to the non-linked islands of the group, most of which are within stoats' swimming distance from each other.

The stoat is a predator, and, in common with many carnivores, frequently engages in surplus killing. In New Zealand, where the stoat is introduced and invasive, it has been implicated in the decline of several native bird species, e.g. the mohua (Elliott, 1996; Dilks, 1999) and kaka (Wilson *et al.* 1998). On mainland UK, the main prey items in the stoats' diet are rabbits, small rodents, birds and eggs (McDonald *et al.* 2000). In Orkney, the stoats' main prey is thought to be the endemic Orkney vole *Microtus arvalis orcadensis*, with potentially serious consequences to the breeding hen harrier and short-eared owl populations (Fraser *et al.* 2015). There is anecdotal evidence to suggest that stoats are also taking advantage of seasonally abundant prey in Orkney, such as breeding waders (B. Ayling, pers. comm.).

Stoats are highly fecund, with early sexual maturity and a prolonged period of delayed implantation, or 'embryonic diapause'. Female stoats are nearly always impregnated, allowing rapid colonisation of new islands. On Terschelling island in the Netherlands, a population of 9 stoats increased to 180 over three years (van Wijngaarden and Bruijns, 1961, in King, 1977). Amstislavsky and Ternovskaya (2000) reported sexual maturity in female stoats as young as 20 days, and virtually all females (juveniles and adults) are impregnated during the breeding season (King and Moody, 1982). Polkanov (2000) reports that at least in captivity, an adult male will visit a den with kits in the mother's absence, mate with the female kits and may kill the male ones. Male stoats are thought to become sexually mature at the age of around 10-14 months (King and Moody, 1982; Polkanov, 2000). An average litter size is in the range of 6-12 kits, born in April-May in the British Isles (King, 1977). Lactation lasts 7-12 weeks although the young will consume solid food from the age of four weeks, and the typical prey-killing pattern is well developed in 3-month old stoats (King, 1977).

2 GOAL, OBJECTIVES and OUTCOMES

The primary purpose of this eradication operation is to remove the predation pressure posed by the invasive non-native stoat on the Orkney native wildlife. The duration of this operation is expected to be five years, from October 2018 to September 2023, including a one-year pre-eradication phase. The preparatory phase will see the development and implementation of protocols, acquisition of relevant permissions, recruitment, procurement, and continued work on community engagement and biosecurity. Several stopping points have been identified between the pre-eradication phases, and these are described in detail in the Project Plan (Bambini *et al.* 2018) and in Annex II. of this Operational Plan. Due to the challenges faced by any stoat eradication, arising from the intrinsic qualities of the target species, and specifically by this operation due to its unprecedented scale both in terms of the land area targeted, and the size of the human population inhabiting the islands, this operation will be subject to active adaptive management.

Adaptive management in conservation takes an experimental approach to management, and sets out hypotheses on the effectiveness of a given management regime which are then tested (Nichols and Williams, 2006; Parkes *et al.* 2006). By applying such a process to the Orkney stoat eradication, described in detail in section 3.1 of the project plan (Bambini *et al.* 2018), we will be able to determine the appropriate trapping density that will achieve the conservation objective of the operation (complete removal of stoats from Orkney Mainland). Through the bi-annual operational review process and adaptive management, new research and learning can also be incorporated in the operational planning to improve efficiencies, and new eradication techniques can be tested as they become available. The operational review process will track the progress of the operation, and assess whether the operational goal and objectives, as detailed below, remain feasible and attainable.

Project Goal: Wildlife on Orkney islands is safeguarded from the invasive non-native stoat *Mustela erminea*

Objectives	Outcomes
1. By August 2019, the extent of the stoat invasion across the Orkney islands is known, robust biosecurity measures are in place to prevent further spread, and plans and funding are in place to remove any satellite populations that have become established on the non-linked islands	1.1 The risks and uncertainties associated with the stoat eradication are reduced and managed
2. By August 2023, stoat density on Orkney Mainland and linked isles is reduced to a level where they are no longer a significant threat to Orkney native wildlife	2.1 Stoat predation pressure has been reduced for the benefit of Orkney native wildlife
3. By August 2025, no stoats remain in Orkney and the risk of new incursions is effectively reduced through a comprehensive and well-resourced biosecurity strategy for the archipelago	3.1 The long-term sustainability of stoat-free Orkney islands is secured

3 OPERATION DETAILS

The main method of control utilised in this eradication will be the lethal DOC150 and DOC200 traps which have been approved for use on stoats by the Spring Traps Approval (Scotland) Order and meet the Agreement on International Humane Trapping Standards (AIHTS) for stoats. Trapping trials carried out in Orkney using these traps demonstrated that they can be deployed effectively to achieve a substantial reduction ('knock-down') in the stoat population (Bell *et al.* 2018). Additional methods such as alternative trap types and shooting will also be deployed (see below, section 3.4 *Implementation Stage 4: Mop-up and monitoring phase*). No biocides (toxins) are currently authorised for use on vertebrates (other than rodents) in the UK under the EU Biocidal Product Regulation 528/2012. An application can be made to the Health and Safety Executive (HSE) as the competent authority in the UK to assess and evaluate the use of a new active biocidal substance under the EU Regulation 528/2012. The cost of an evaluation is currently (2018) charged at £495 per day, and the standard fees of £130,000 for a full data package (as may be required for e.g. para-aminopropiophenone (PAPP)) and £55,000 for the EU process apply, in addition to various administrative charges.

Stoat trapping work in New Zealand and in the UK has shown a strong seasonal bias in the sex of animals trapped, so that in spring the majority of animals caught are males, whereas the majority of females are caught in late summer. This means that females that are pregnant or lactating are usually caught only in very small numbers; most of the females caught are in the 'delayed implantation' stage or their reproductive cycle (King and Moody, 1982; McDonald and Harris, 2002). It is possible to determine the female stoats' reproductive status by examining the ovaries for the presence of *corpora lutea*. The *corpora lutea* are small (0.4-0.6 mm across) during delayed implantation, and enlarged (0.9-1.4 mm) during implantation (King and Moody, 1982). Trapping is thought to be most effective as a control tool in winter and early summer, and shooting of females in late winter and early spring contributes disproportionately to the efficacy of control measures (McDonald and Harris, 2002).

This eradication operation will be supported by a monitoring programme, which will collect data on stoat abundance using tracking tunnels and motion-triggered trail cameras operated by citizen scientists. Orkney's native wildlife will also be monitored by volunteers and citizen scientists, and seasonal research assistants will collect wader and hen harrier productivity data to gather evidence on the conservation impact of the stoat removal in Orkney. The details of this monitoring programme are not included in this Operational Plan, but are provided in the Project Plan.

3.1 Implementation Stage 1: Finalising land-access permissions

Initial land-access permissions will have been secured by the ONWP team, across the entire eradication area, by end of January 2019. All land holders will be contacted by the ONWP to request written permission, by January 2019, to access their land and to hold their contact details for the duration and purposes of the eradication.

The trapping team (10 trappers and two trapping foremen), with the support of the community engagement officer and manager (two persons), is required to finalise these access agreements through **face to face discussions with each land owner**. The trapping team will be supplied with detailed maps of the land-holdings, and will discuss with each landowner to agree on access routes, where to park, the use of conservation detection dogs, placement of and frequent checks of traps on their land. Access to all land will be required, but small parcels of land can be temporarily avoided e.g. to avoid disturbing cows with young calves. When accessing fields, the trappers will walk along field

boundaries to avoid unnecessary trampling of crops, and will access fields through gates wherever possible, to avoid causing damage to fencing and boundary walls.

The trapping foremen will plan and coordinate this work, and provide the project manager with weekly updates on progress. This work will be completed in five months, from February to June 2019. This is based on the Bell *et al.* (2018) estimate that this task can be achieved at a rate of 1.25 km²/person/day (translating to approximately 470 person days to cover the entire eradication land area), with an in-built contingency that will allow for any delays resulting from lengthy negotiations with some landowners.

3.2 Implementation Stage 2: Establishment of trapping network

This work will be carried out by the trappers, with the support of the community engagement officer and the trapping foremen. The trapping foremen will draw up a work plan and carry out weekly progress reviews with the project manager. This work will be completed in 3 months (July-September 2019).

The primary trap used in this eradication is the DOC150 trap, in a double-set configuration placed in an extended “weka”-design wooded tunnel built to the manufacturer specifications (see Annex III.), as permitted by the Spring Traps Approval (Scotland) Order (STAO) 2011 (as amended), with baffles fitted at either end of the housing tunnel, and additional internal baffles in place to direct the animal to a correct position on the kill-plate to ensure a humane and effective kill. Approximately 20% of the traps will be the larger and more powerful DOC200 traps, placed in a single-set configuration and housed within a baffled wooden cubby. Only stainless steel DOC traps will be used. The traps should be bolted, not screwed, into the base of the wooden trap housing to facilitate removal for servicing and maintenance, and to extend the lifetime of the trap housing in a damp environment.

Traps will be placed along linear features that stoats are likely to utilise when moving through the landscape, such as field boundaries, dry stone walls, along the edges of waterbodies and ditches. The knowledge and skills of experienced stoat trappers should be utilised when deciding on trap siting. All trap boxes should be secured to the ground with stakes, and the trap should be on level ground to ensure it is stable. The traps may need to be dug in to a depth of few centimetres, depending on location.

The habit of stoats returning to sites where they have been successful at obtaining food can be used to the advantage of a trapping campaign (Polkanov, 2000). To encourage stoats to explore the traps and to associate them with food, all traps will be baited, using fresh rabbit, egg, beef offcuts or smoked mackerel. Long-life baits, as they become available, should be trialled and if effective, used particularly during the warmer months. Salted rabbit may be as effective as fresh rabbit (Pierce *et al.* 2007).

In addition to the DOC-traps, 1,000 self-resetting Goodnature A24 traps will be used (provided that these have been added to the Scottish STAO) as an alternative trap type that does not require the animal to enter trap housing, and may target trap-shy individuals, although an external baffle may need to be fitted to reduce the risk to non-target species (mainly hedgehogs). The A24 traps will be deployed after the primary traps are in operation. Despite mechanical failures in operational scale trials carried out in New Zealand across approximately 9,000 ha of conservation land, the Goodnature A24 traps were found to effectively suppress stoat populations (Gillies *et al.* 2012). Several improvements to the A24 trap design have since been implemented (D. Peters, pers.comm.), and trials carried out in the UK found that the external baffles effectively exclude hedgehogs from these traps (Campbell and Hartley, 2018).

Traps will be placed along easily walkable routes (‘trap lines’) at a density of approximately **12 traps km⁻² or 1 trap for every 8.3 ha**. This is based on the assumption that stoats in Orkney are at moderate to high density and can therefore be expected to have small home ranges, and the requirement to put every target animal at risk in an eradication. At this density, traps will be at a distance of approximately

250 metres from each other, along trap lines that are approximately 350 metres apart, across the entire eradication land area (58,398 ha). This equates to 7035 trap locations, but trap placement will make use of linear features and not be based on a rigid grid.

In practice, trap placement should initially make use of existing roads and tracks, with new trap lines established across the less accessible areas. The trapping team will select routes through the landscape that will be accessible throughout the year and will facilitate efficient checking and servicing of the traps. It is unlikely that track-cutting will be necessary, but if needed, landowner approval must be sought first. Trap density may vary across the eradication area, so that traps are in higher density in habitats that support higher number of stoats; once traps are operational, trapping rate data will indicate where trap density may need to be increased to up to 16 traps km⁻², or 1 trap for every 6.25 ha (see Adaptive Management Process, Section 3.1 in the Project Plan). The trapping trial results suggest that the moorland areas may support more stoats.

Stoats are likely to be present in urban and residential areas, where more people can be expected to come into contact with the traps and the eradication team. Trapping in these areas must be planned sensitively, and implemented with the support of the community engagement manager and officers.

Trap establishment will begin from West Mainland (as the most likely source of unassisted stoat dispersal to non-linked isles) and proceed systematically across the entire eradication area. The eradication operation team will make a judgement on trap line placement, in discussion with and subject to landowner approval. Trap lines should follow linear features such as water bodies, field margins, dry stone walls and fence lines. Each trap line will be walked once, recording the track on a handheld GPS, to identify suitable trap locations. These will be marked, and the trapper(s) will return to place the traps at these locations, recording a GPS point for each trap and noting down the surrounding habitat. Traps will be placed along linear features (e.g. stone walls, ditches, field boundaries etc.) and will be **pre-baited but not set**. If possible, 2-3 rounds of baiting should be completed before the traps are set to catch stoats. Trap location data will be entered into the eradication database promptly by the trappers; the trapping foremen will be responsible for maintaining the database, and accountable for ensuring high quality of the data collected. For each trap location, the wider habitat type, or 'macrohabitat' (e.g. unimproved grassland, improved grassland, heathland) and the microhabitat, or immediately proximate habitat (e.g. road verge, ditch, watercourse) will be recorded.

Each trap will have a label (Annex IV) with a unique trap identification number, contact details, and a warning to alert members of the public to the potential risk of injury resulting from tampering with the trap. To reduce the risk of trap interference, a public engagement and awareness raising campaign will be ongoing in Orkney to support the eradication operation. Trap housing will also be secured with a cable tie or similar, to reduce the incentive to open the lid.

3.3 Implementation Stage 3: Knock-down phase

In October 2019, once all the traps have been placed in the environment, the trapping team will refresh the bait and set all the traps, again starting from west Mainland so that all traps have a period allowing for 'weathering' and pre-baiting. All traps will be baited throughout the operation using fresh rabbit, egg, beef offcuts or smoked mackerel. Salted rabbit, dried rabbit and fish-flavoured cat food can also be used, if these prove effective. New long-life baits, as they become available, should also be trialled and if effective, used particularly during the warmer months. Stoat lures, if proven effective, should be used in a proportion of the traps, for example by adding lure to every second trap along a trap line.

The trapping team will aim to complete a trap check at each trap **at least once every three weeks** throughout the operation. Each trapper will be responsible for maintaining approximately 650 trap

locations, with each trapping foreman responsible for approximately 268 trap locations. This translates to an average trap check rate of 44 traps/day/trapper, and 18 traps/day/foreman. At trap spacing of 250-metres, this could require up to 11 kilometres of walking per day per trapper. The requirement for meticulous data recording has been accounted for here, and it is possible that more trap checks per day can be completed by most trappers in most areas. In this case, trap check frequency can be increased, to ensure the bait remains attractive to stoats and to increase trap nights.

Trapping density or trap check frequency may need to be increased in areas where stoat capture rates are high, but it is anticipated that the same team of trappers will be able to manage the increased workload by increasing efficiencies as the operation progresses. Some trap lines will be serviced by car (along roads) or using ATVs, with landowner permission, enabling faster trap checking. Each ATV should at all times carry two spare traps in their housing, to enable trap replacement as needed e.g. for servicing or repairs, or if a trap has been damaged or removed. The trapping team may need to be supplemented with seasonal staff or by other project staff to cover periods of leave or other absence.

This phase of the eradication operation is expected to last up to three years, and will proceed as planned, subject to 6-monthly technical reviews and a formal adaptive management process (see below, and the Project Plan for more details). Trap check frequency will remain the same until the trapping rate approaches zero, or operational reviews recommend a change in the frequency of checks. Bayesian catch-effort modelling (e.g. Fukusawa *et al.* 2013; Rout *et al.* 2014) and adaptive management will be used to inform operational planning. It is vital that accurate records of the trapping effort are kept (unit effort = trap days, or TD, i.e. days each trap is active). Trapping rates (i.e. number of stoats caught per unit effort) will vary across trap locations, habitat types, season, bait type etc., and keeping accurate records of this information is vital to the success of the eradication operation. When stoat trapping rate starts to approach zero across all traps, the operation will move to a 'mop-up' phase (see next section).

At each trap and during each trap check, the trapper/foreman will: record trap check data as instructed, using dedicated datasheets (Annex V); inspect the trap and ensure its correct and safe functioning; clean the trap housing and remove any animal remains; clean the trap and carry out any repairs as necessary; replace the bait and refresh the stoat lure, if used. As part of the routine trap maintenance, each trap needs to be calibrated regularly to the correct spring-off weight. This should be set to **at least 80 grams** to reduce the risk of capturing Orkney voles, whilst ensuring that even the smallest female stoats entering the traps are captured.

All carcasses will be removed from the traps, and all **non-target species** will be collected in clearly labelled bio-hazard bags. Each trapper will carry such a bag with them at each trap check, and will wear protective gloves when handling animal carcasses (for full details, see the Health and Safety Plan Section 6 of this plan, and the appropriate risk assessments). Once back at the vehicle, the trapper will place the bag in a sealable container which will be emptied into a larger sealable container for storage once back at the operational base. These containers must also be clearly labelled as containing bio-hazardous waste. During colder months, the larger container, kept in a secure area at the operational base, will be collected at two-weekly intervals for waste disposal. During warmer months, weekly collections must be made. All animal carcasses must be incinerated safely and in an environmentally responsible way. For a detailed waste management plan, see Annex VI.

The sex of all stoats caught in the traps will be recorded in the field (if possible), and a clear label (detailing collection date, time, trap location and initials of the collector) will be attached to each stoat carcass; each carcass will be placed in an individual, labelled clear plastic bag and placed in a cool box once back at the vehicle. Once back at the base, all carcasses should be weighed, measured, and (if the carcass is fresh) an autopsy should be carried out to extract (and store in a clearly labelled vial) stomach contents. For female stoats, the uterus and ovaries should be checked to determine the reproductive status of the animal. All stoat carcasses will be stored in a chest freezer and kept at temperatures of -6°C for further analyses, including DNA sequencing, and ageing.

Each trapper will be responsible for entering field data, from the traps they manage, into spreadsheets and submitting these weekly to their trapping foreman who will be responsible for entering these data onto the eradication database. The eradication database will be updated on a weekly basis, and at the end of each week, the trapping foremen will submit a progress report to the Project Manager. In addition to the trapping foremen and the Project Manager, the Conservation Scientist and key staff at the RSPB and SNH will have access rights to the eradication database.

The Project Manager will ensure that the eradication is progressing as planned, and will compile monthly progress reports to the Project Board. The Project Manager will work closely with the Conservation Scientist who will analyse the trapping data on a six-monthly basis, and together with the Project Manager and with the support of the trapping foremen and the Communications Manager, will produce six-monthly technical reports which will be used to carry out regular operational reviews as part of the adaptive management process for this eradication (see Section 3.1 in the Project Plan).

3.4 Implementation Stage 4: Mop-up and monitoring phase

As stoat density across the eradication area approaches zero, trapping rates are expected to decline significantly. When the trapping rate has been close to zero for a period of 6 months, a decision will be made through the adaptive management process on what changes should be applied to the trap check frequency. It is important to ensure that this can be done without compromising trap availability (i.e. depending on the rate of non-target bycatch and the bait types used). During this phase of the operation, more effort will be invested in active searches for surviving stoats by the conservation detection dog team. The use of alternative trap types and shooting are likely to also become critical to the success of the eradication at this stage. This phase of the operation is critical to the success of the eradication, and maintaining the same (or greater) level of resourcing is essential. The trapping foremen will continue to work closely with the project manager and conservation scientist to produce 6-monthly technical reports, and regular operational reviews will continue to be carried out by external experts.

During year-2 (expected August 2020) of the eradication operation, three (3) trained and certified conservation detection dogs will join the eradication operation team, along with three dedicated full-time handlers (see Annex VII. for the conservation detection dog RSPB Code of Practice). The training of these dogs will start as soon as possible, and before the start of the eradication. The three handlers will each operate a dog to systematically search across the entire eradication area for signs of stoats. It is anticipated that the team will spend approximately 80% of their time on this activity, with the remainder spent on assisting with biosecurity work across the archipelago (see next section for details). A further three dogs will join the operation during year-3 (expected June 2021), and will be allocated to members of the trapping team. These trappers will be selected during year-2 of the operation, and will receive full training in the skills required to handle a conservation detection dog. The trappers will also receive training in handling firearms (if required), and will be licensed to operate a firearm. Once paired up with a trained dog, these trappers will be allocated fewer trap check responsibilities and will spend a proportion of their time searching for stoats with the conservation detection dog. At the end of each day, any stoat signs picked up by the dogs will be entered into the GIS-linked eradication database by the handlers to inform work plans produced by the trapping foremen.

It is essential that during this phase of the eradication, if not before, different bait types and trap designs and configurations are tried, in order to target the remaining stoats. It is probable that the surviving individuals will have encountered DOC traps, and trap shyness is a likely cause of trap avoidance. When stoat sign is picked up by the dogs, the handler should always make an attempt to home in on the location of the animal. The team of three handlers should work as a team, and may call upon the help of the handler-trappers to help locate an individual stoat. When a stoat is found, the handler may attempt to dispatch it by shooting if it is safe to do so. In every other instance, the response will be to

mount an intensive trapping regime in the area to target the stoat. Similarly, when a den is discovered, traps will be deployed immediately at very high density in the surrounding area. As many trap types and bait choices as possible should be utilised, and these traps should be checked weekly if possible.

Once trapping rate has reached zero and systematic dog searches are finding no more fresh stoat sign, trap check frequency can be decreased to 8-week intervals, and only long-life baits and stoat lure will be used. This level of trapping effort and the systematic dog searches will continue for a period of 2 years following the last confirmed presence of a stoat. Throughout the eradication operation, the Orcadians are asked to remain vigilant and are encouraged to report any stoat sightings. In the mop-up phase of the eradication, these reports from members of the public become even more important, and the community engagement officers will follow up every report with an interview and if the presence of a stoat is suspected, a site visit, accompanied by a trapping foreman if possible.

At the completion of a 2-year period with no confirmed reports of stoats, no stoats captured in traps or by monitoring tools (such as motion-triggered trail cameras, operated by volunteers), and no fresh sign detected by the conservation detection dogs, the eradication can be declared a success and the operation will end. The legacy of the Orkney Native Wildlife Project will be a comprehensive and well-resourced biosecurity strategy, implemented across the archipelago. Any traps that remain operational at the end of the eradication, will be transferred to biosecurity trapping use. The trapping grid across the eradication area will be dismantled and all traps will be collected and placed in storage.

3.5 Implementation Stage 5: Operational biosecurity and long-term project legacy

During the planning and development phase of the Orkney stoat eradication, a Biosecurity Plan was produced for the archipelago (Harper, 2017b). The purpose of this plan was to reduce the risk of stoats spreading to, and establishing on the non-linked islands of Orkney. The plan outlined biosecurity containment trapping areas on Orkney Mainland, and a protocol for incursions responses. This plan was implemented in 2017-18. In 2019, greater effort will be invested in surveillance trapping on the non-linked isles, and an Orkney biosecurity working group will be formed with the objective of developing a long-term biosecurity strategy for the archipelago.

During the stoat eradication operation, the team of three dedicated dog handlers will also be responsible for carrying out frequent dog-assisted biosecurity checks on high-risk islands that are within swimming distance from Orkney Mainland, and once island-specific biosecurity plans have been implemented, will work closely with the biosecurity officer to carry out checks on any agricultural loads transported from Orkney Mainland to any of the non-linked isles.

Dog-assisted stoat searches will be carried out on Hoy, Graemsay, Flotta, Eynhallow, Shapinsay, Gairsay, Wyre and Rousay in 2018 and 2019, then quarterly (every 3 months) during 2020-2022, and once every six months thereafter. These searches will target areas with suitable habitat and along the coast nearest to Orkney Mainland, unless reported stoat sightings or evidence from the surveillance network suggests that stoats are present. In a suspected incursion, a more intense response will be required (see below). The other inhabited non-linked islands will be checked for stoat presence by a contractor during summer 2019, and will be checked again by the ONWP dog team towards the end of 2022 and before the eradication operation is declared a success.

During 2019, the Biosecurity Officer, assisted by the trappers and the community engagement officers, will install a network of biosecurity traps and surveillance devices on high-risk islands including Graemsay, Flotta, Eynhallow, Shapinsay, Gairsay, Wyre and Rousay. DOC traps will be installed along coastal areas closest to the Orkney Mainland, along trap lines at approximately 200 metres apart. On larger islands (Hoy, Rousay and Shapinsay), two parallel trap lines may be established, within 200 metres of one another. Approximately 100 traps will be installed on Shapinsay and Rousay, with

approximately 140 traps on Hoy. The smaller islands will have traps distributed across them, at an approximate density of 8 traps km⁻². Additionally, motion-triggered trail cameras and footprint tracking tunnels will be installed in strategic locations across the high-risk islands. The traps will be baited with long-life bait, but no stoat lure will be used, as a precautionary measure until stoats Orkney Mainland have been eradicated. Traps will be checked and the bait replaced every 8 weeks. Trail camera SD cards and footprint tracking plates will be checked and replaced monthly.

If the surveillance network or the dog-assisted searches uncover evidence of stoat presence, the biosecurity officer will lead an incursion response, assisted by the conservation detection dog team, volunteers and SNH and RSPB Orkney staff. DOC150 and 200 traps will be deployed, baited with fresh bait, and checked weekly for one month and every two weeks thereafter. On larger islands, the incursion response will target areas at a density of 16 traps km⁻² where stoat sign is detected by the dogs, but on smaller islands (<10 km²) an island-wide trapping grid will need to be established at this density. This trapping density will be reviewed as experience is gained from trapping on Orkney Mainland and the linked isles. If a large number of traps (>150) needs to be deployed, the trapping foremen will accommodate incursion trap checks to the trapping team's work plan on a temporary basis to cover for any staff shortages.

The community engagement manager, biosecurity officer and the community engagement officers will work with island communities to develop community-led, island specific biosecurity plans. The island communities will be supported in the delivery of these plans, which will encompass high biosecurity risk activities such as the transport of agricultural products to and from the island. On each inhabited island, volunteer Biosecurity Champions will be recruited and trained in maintaining the biosecurity trap and surveillance network. Across Orkney, a dedicated team of predator incursion response volunteers will also be recruited and trained. In the future, when Orkney is stoat-free, these volunteers can be called upon to carry out responses to any new predator incursions across the archipelago.

The Orkney Native Wildlife Project Partnership is committed to supporting the long-term predator biosecurity of the islands. The biosecurity officer will form and coordinate a biosecurity working group, formed of key stakeholder and community representatives and tasked with developing a long-term biosecurity strategy and funding plan for a stoat-free Orkney. This strategy will encompass high-risk activities such as the transport of straw and hay in to Orkney from mainland Scotland, and will provide a framework for supporting island-specific biosecurity plans and maintenance of surveillance networks across the archipelago.

All activities undertaken by the eradication operation team on private land will follow the ONWP Land Access Protocol (Annex VIII.)

4 NON-TARGET SPECIES

A large number of potentially affected non-target species are present in Orkney. Overall, the number of individual animals of non-target species caught in the traps is expected to be small (with the exception of the brown rat *Rattus norvegicus*) and the overall conservation benefit of the stoat eradication will compensate for any losses in the short term. The net population level impact of the stoat removal on all non-target species is expected to be positive, through reduction in predation pressure and competition for resources. The impact on non-target species has further been reduced through mitigation measures outlined below.

Domestic animals

The only domestic animals likely to be at risk from the operation are free-roaming pet cats. These are relatively common in Orkney, and are likely to encounter traps particularly in the urban fringes and around farmsteads. The extended 'weka' design DOC trap housing (see Annex III.) provides a distance of 357 mm between the entrance to the trap housing, and the entrance in the internal baffle, reducing the likelihood of a cat being able to reach the kill plate and be injured by the trap. The entrance in the external baffle is 6X6 cm, and whilst preventing entry by the animal, may in exceptional circumstances allow a cat to get its head stuck in the trap housing. In such circumstances, it is expected that the cat will be discovered and can be released unharmed. Dogs are less likely to get stuck in the traps in this way, or attempt to reach the bait inside using their paws.

Orkney vole

The Orkney vole, due to its small size, will be able to enter the traps freely. To reduce the risk of captures of this and other small non-target species, the DOC traps will be set to a minimum triggering weight of 80 grams, which will allow for the smallest female stoats to be captured (≥ 140 g) but should not be triggered by the voles which weigh 30-70 g (*The Orkney vole – a management guide*, Scottish Natural Heritage).

Birds

Similarly to the Orkney vole, some small passerines are able to enter the DOC trap housing freely. Some species, e.g. the wren and starling, are more likely to do so and may be able to trigger the trap if they flutter around the trap housing in an attempt to escape. Careful trap placement is the only available option to reduce the risk of passerine captures. It is anticipated that a very small number of birds will be killed in traps in this way, and the trapping work carried out during 2017-18 supports this.

Otter

An adult otter will not be able to enter the DOC trap housing, and will not be able to reach the kill plate of the trap(s) within. Hung and Law (2014) report mean zygomatic breadth of otter skulls from East Germany as 73.87 mm (65.9–81.5) for males and 67.33 mm (61.8–74.8) for females. It is therefore possible that a juvenile otter, or a small female, will be able to put its head through the entrance in the external baffle and may become stuck. The likelihood of this happening is considered to be low; to date, no otter interactions with the traps have been observed in Orkney. The Hebridean Mink Project has not had any instances of otter captures in the BMI Magnum 116 traps it operates, with an average of 12,000 monthly trap nights (SNH unpublished data).

Invasive non-native species

This category includes all other mammals in Orkney; only the otter and Orkney vole can be considered native to the archipelago. Brown rats are the only species that can be expected to be caught regularly

in the DOC traps, and there is no way to reduce the risk of them being caught due to their similar size and weight to the target species, the stoat. The operation is unlikely to result in the eradication of the rat in Orkney, due to the trap spacing (>250 m). The DOC traps are humane and approved for use on the rat in Scotland.

The other non-native mammalian species present are house and field mouse, cats and hedgehog. Mice, similarly to the Orkney vole, are unlikely to trigger the DOC traps due to their low weight. Feral cats, as with the domestic cat, are unlikely to be injured in the DOC traps. In the unlikely event that a cat will be caught and injured in a trap, it will be captured and provided with veterinary care. Domestic cats will be returned to their owners, or if no owner can be found, re-homed. No cats will be released in to the wild, in compliance with section 14(1) of the Wildlife and Natural Environment (Scotland) Act 2011. Adult hedgehogs may get through the entrance to the trap housing, but the likelihood of their capture can be reduced by careful trap placement. It is unlikely that many (if any) hedgehogs will be caught; none were caught in the biosecurity containment trapping or the trapping trials carried out in 2017-18.

Table A: Risk assessment for non-target species during the eradication of stoat *Mustela erminea* on Orkney Mainland and linked isles

Species	Potential impact	Preventative action	Risk
Livestock (sheep and cattle)	Disturbance	Avoidance of fields with young lambs or calves; walking along field boundaries; dogs kept on leash when around livestock. Dogs are trained not to respond to any non-target animals; cattle are more likely to pose a danger to trappers, dogs and handlers, and may have to be avoided on health and safety grounds.	Low
Domestic and feral cats	Injury	Extended 'weka' design trap housing precludes reaching of the kill-plate	Negligible
Hedgehog <i>Erinaceus europaeus</i>	Death or injury	Small entrance to trap housing; A24 traps fitted with external baffles; trap placement.	Low
Rat <i>Rattus norvegicus</i>	Death	None available; invasive non-native species widely controlled e.g. around farming operations	High

House and field mouse <i>Mus musculus</i> <i>Apodemus sylvaticus</i>	Death	Trap sensitivity adjusted to prevent mice triggering the trap	Low
Orkney vole <i>Microtus arvalis orcadensis</i>	Death	Baits and lures used may deter voles; trap sensitivity adjusted to prevent voles triggering the trap	Low
Otter <i>Lutra lutra</i>	Injury	Extended 'weka' design trap housing precludes reaching of the kill-plate	Negligible
Hen harrier <i>Circus cyaneus</i> Short-eared owl <i>Asio flammeus</i> Corncrake <i>Crex crex</i> Little tern <i>Sterna albifrons</i> Whimbrel <i>Numenius phaeopus</i> Merlin <i>Falco columbarius</i> Peregrine falcon <i>Falco peregrinus</i> Red-throated diver <i>Gavia stellata</i>	Disturbance	Some disturbance may be unavoidable but every effort will be made to keep this to a minimum; trap checks can be adjusted to avoid the most sensitive periods during the breeding season. Schedule 1 licence may be required.	Low
Wader spp.	Disturbance	Some disturbance may be unavoidable but every effort will be made to keep this to a minimum; trap checks can be adjusted to avoid the most sensitive periods during the breeding season.	Low
Starling <i>Sturnus vulgaris</i>	Death, disturbance	Widespread on Orkney and disturbance may be unavoidable; entry to traps cannot be	Medium

Wren <i>Troglodytes troglodytes</i>		prevented but trap placement will mitigate substantially the risk of this happening.	
Black-tailed godwit <i>Limosa limosa</i> Garganey <i>Anas querquedula</i> Greenshank <i>Tringa nebularia</i> Pintail <i>Anas acuta</i>	Disturbance	Rare or occasional breeding species on Orkney; Schedule 1 licence may be required but nesting sites can probably be avoided entirely.	Negligible

5 ENVIRONMENTAL IMPACT

Due to its extensive scale and scope, this operation is expected to have a moderate to significant environmental impact in Orkney. A full Habitat Regulations Appraisal (HRA) will be carried out by Scottish Natural Heritage in autumn 2018, one year ahead of the eradication start date. The HRA will assess what impact the operation will have on Natura2000 sites and features present in Orkney. Historic Environment Scotland (HSE) will be consulted on the impacts on scheduled monuments and World Heritage Sites, and any recommended mitigation measures will be implemented by the operation. Some of the project impacts are considered positive (benefits to the Orkney native wildlife), and others can be mitigated effectively. In this section, these mitigation measures are outlined (Table B.). The potential environmental impacts of this operation can broadly be split into the following categories:

- Release from predation pressure and resource competition (Orkney native wildlife)
- Release from predation pressure and resource competition (other invasive non-native mammals)
- Disturbance to breeding birds
- Trampling of sensitive habitats
- Death or injury to non-target species that enter the DOC (and Goodnature A24) traps
- Soil compacting affecting historic or archaeological sites, including scheduled monuments
- Physical damage to archaeological features or scheduled monuments
- Waste resulting from the eradication operation, including bio-hazardous waste (animal carcasses)
- Carbon footprint of the eradication operation

Table B. Negative environmental impacts and mitigation measures implemented during the stoat eradication operation on Orkney Mainland and the linked isles.

Environmental impact	High risk activities	Measures in place to reduce the impact
Release from predation pressure and resource competition (Orkney native wildlife)	The removal of stoats	N/A
Release from predation pressure and resource competition (other invasive non-native mammals)	The removal of stoats	None. This removal of stoats may lead to a temporary increase in other non-native predators in Orkney that may have been in resource competition, or preyed on by the stoats. It is expected that populations will quickly return to pre-2010 levels when stoats were absent from the Orkney ecosystem.
Disturbance to breeding birds	Human presence in breeding territories: trapping operation,	Disturbance will be minimised through careful planning of work during bird breeding season; hen harrier and short-

	dog-assisted searches, stoat and native wildlife monitoring	<p>eared owl nest locations will be mapped and the trapping team will avoid the vicinity of these during the most sensitive periods. Trap lines and dog searches will follow linear features and field boundaries to avoid disturbance of breeding waders and terns, and to prevent trampling of nests and eggs.</p>
Trampling of sensitive habitats	Off-road walking and use of ATVs during trapping operation, dog-assisted searches, stoat and native wildlife monitoring	<p>Trap lines will follow existing roads, tracks and linear features wherever possible to reduce impact of regular footfall. When crossing vegetated areas is unavoidable, care is taken to minimise disturbance to soil and vegetation by e.g. slightly altering the route taken on every visit.</p>
Death or injury to non-target species that enter the DOC (and Goodnature A24) traps	Trapping operation	See section 4 and Table A of this plan
Soil compacting affecting historic or archaeological sites, including scheduled monuments	Off-road walking and use of ATVs during trapping operation, dog-assisted searches, stoat and native wildlife monitoring	Access routes to and around sensitive sites will be agreed in discussion with HSE and local site managers.
Physical damage to archaeological features or scheduled monuments	Digging of soil during trap placement; direct physical damage (intentional or unintentional).	<p>Digging of soil to the depth of >100 mm will not be done in the vicinity of archaeological features or any heritage sites. Care is taken when operating in the vicinity of any such site, and as far as is operationally feasible, traps will not be placed adjacent to scheduled monuments.</p>
Waste resulting from the eradication operation, including bio-hazardous waste (animal carcasses)	Trapping operation: damaged traps and other equipment, oil and chemicals (e.g. vehicles, disinfectant used in farm biosecurity), bio-hazardous waste (decomposing bait, animal carcasses).	All waste material will be removed from the environment and recycled wherever possible, or disposed of as appropriate, as detailed in the Waste Management Plan (Annex VI. of this plan).

Carbon footprint of the eradication operation	All durable and consumable goods used by the operation; transport of staff and equipment; energy use at operations base.	Every effort will be made to reduce the carbon footprint of this operation by sourcing materials (esp. trap housing and bait) locally. Recycled and/or environmentally friendly materials will be used wherever possible, and all waste materials will be recycled if possible. Road transport emissions will be minimised as far as possible through careful planning of trap lines and work plans and schedules, and car-sharing as much as possible. Any meetings with off-island staff will be conducted over telephone or video conferencing facility whenever practicable to reduce the need to travel to meetings. Energy needs of the operational base will be supplied by renewable sources if possible and a paperless office policy will be in place as far as practicable.
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6 HEALTH AND SAFETY

A detailed Operational Health and Safety plan will be produced by the Project Manager, with the support of the Community Engagement Manager and the trapping foremen. The H&S Plan will include risk assessments for all activities carried out as part of the eradication operation (Table C). Risks to the trapping team, volunteers, and local residents will be assessed and reduced as far as possible.

The Community Engagement Manager will, with support from the community engagement officers, work together with stakeholders to raise awareness and to ensure that the Orcadians are well-informed and recognise e.g. the risk of injury resulting from tampering with any of the traps in use by the operation.

The Project Manager will be responsible for the Health and Safety of the eradication operation team. All staff must familiarise themselves with the H&S plan and the detailed task-specific risk assessments, and follow safe practices and operating protocols at all times. The eradication team will be provided with personal protective equipment, and plans and protocols are in place and will be followed in the event of an incident. All vehicles and equipment are insured and maintained in safe operating condition, and the project staff are covered by the RSPB's Staff Insurance Policy.

Table C. Operational activities for which risk assessments are *to be completed by the Project Manager*.

Risk	Activities affected	Relevant Risk assessment and/or Code of Practice
Livestock (particularly cattle)	Setting, checking and servicing traps, dog searches	<i>To Be Completed (TBC)</i>
Handling animal carcasses	Checking traps	<i>TBC</i>
Handling decomposing bait	Checking traps	<i>TBC</i>
Handling traps – risk of injury	Setting, checking and servicing traps	<i>TBC</i>
Handling/euthanizing wild animals	Checking traps	<i>TBC</i>
Heavy lifting	Moving traps	<i>TBC</i>
Lone working	Setting, checking and servicing traps, dog searches	<i>TBC</i>
Operating tools	Setting, checking and servicing traps	<i>TBC</i>
Operating ATVs	Setting, checking and servicing traps	<i>TBC</i>
Firearms	Setting, checking and servicing traps, dog searches	<i>TBC</i>
Hypothermia, heatstroke, severe weather	Setting, checking and servicing traps, dog searches	<i>TBC</i>

Drowning	Operating on boats or around waterbodies	<i>TBC</i>
Dogs – risk of injury	Setting, checking and servicing traps, dog searches	<i>TBC</i>
Electric fences – risk of injury	Setting, checking and servicing traps, dog searches	<i>TBC</i>
Working in uplands – risk of injury, severe weather	Setting, checking and servicing traps, dog searches	<i>TBC</i>
Working near cliffs	Setting, checking and servicing traps, dog searches	<i>TBC</i>
Walking over rough ground – risk of injury	Setting, checking and servicing traps, dog searches	<i>TBC</i>

7 LOGISTICS

Orkney is easily accessible by air from major cities on mainland UK, with regular scheduled flights departing from Manchester, Glasgow, Edinburgh, Aberdeen and Inverness. Several ferry routes also connect Orkney to mainland UK, with services operating car and passenger ferries Scrabster – Stromness, Aberdeen – Kirkwall, Gills Bay – St Margaret's Hope, and seasonally John O'Groats – Burwick for foot passengers only.

Within the Orkney archipelago, the inhabited islands are connected to Orkney Mainland by regular ferry services to Hoy, Graemsay, Flotta, Rousay, Egilsay, Wyre, Shapinsay, Stronsay, Sanday, Eday, Westray, Papa Westray and North Ronaldsay. Foot passengers do not need to book in advance but it is advisable that cars are booked in advance. The inter-island ferries are operated by the Orkney Islands Council (<http://www.orkneyferries.co.uk/>). Inter-island flights are operated by Loganair to most of the inhabited islands. Stoat surveillance equipment can be transported to the non-linked isles by vehicles taken across on the ferries where these operate, but some islands will be accessed by chartered boats (e.g. Gairsay and Eynhallow).

The Orkney Native Wildlife Project team will have a dedicated office (hereinafter the Operational Base), most likely located in the Kirkwall area (to be confirmed) within easy transport and road connections to all parts of the Mainland and linked isles. The Operational Base will provide office facilities including desk space for up to 20 people, a large meeting room with capacity to fit the entire ONWP team, changing and shower facilities, a kennelling area for the dogs, storage space with capacity to house the spare traps and traps awaiting repairs, freezers and additional equipment needed by the operation, and a well-equipped workshop area for essential trap maintenance and repairs. The Operational Base will have sufficient freezer space to accommodate a 3-month supply of bait, and up to 1,000 stoat carcasses. Frozen or otherwise preserved stoat carcasses will be periodically shipped to mainland UK for permanent storage, as required and when storage space on Orkney is approaching capacity. The Operational Base will also have an outside space where a lockable/secure storage container for biohazardous waste (non-target bycatch and used bait) will be held.

The Project Manager and the rest of the ONWP team will be working from the Operational Base on a day-to-day basis, with the team of trappers and trapping foremen (and later the conservation dog team) being entirely or largely working in the field but with unrestricted access to facilities at the operational base. All ONWP staff are expected to be responsible for their own accommodation arrangements.

All procurement, including the procurement of project vehicles, the Operational Base, and all equipment required for the eradication, will be carried out in the pre-eradication phase during 2018-19. DOC traps will be purchased from the UK and NZ suppliers, and shipped to Orkney by sea. The trap housing, or cubbies, will be built by carpenters based locally in Orkney as far as possible, but due to the limited capacity and the need to construct in excess of 5,000 trap boxes (including a mix of single-set and double-set tunnel designs, details in Annex III.), it is likely that carpenters based on UK mainland will also be utilised. The trap housing constructed on UK mainland will be shipped to Orkney overland and by sea. Bait used by the operation will be sourced locally as far as possible, but UK and NZ suppliers will be used as and when required.

The Orkney Islands, especially Mainland and the linked isles, have an extensive network of roads and tracks that are accessible to vehicles. The moorland areas additionally have an existing network of rough tracks (see Figures 3&4 for examples), created for the purposes of peat cutting that are accessible by 4X4 vehicles and ATVs. This existing road and track network will be utilised extensively by this eradication operation, both for the placement of traps (see section 3.2 above), and for servicing the trap network.



Figure 3. A peat-cutting trail on an Orkney Mainland moor.



Figure 4. An aerial image of a section of the Orkney Mainland Moor, showing rough tracks and a mosaic of habitats and land-uses.

The eradication team of 10 trappers and two trapping foremen will have access to two ATVs with trailers, and a fleet of six vehicles for the duration of the operation, including two pick-up trucks and trailers, and four crew vans capable of carrying up to 6 passengers. The crew vans have a load space of at least 4 m³. Two trailers for transporting the ATVs will also be available to the team. Each m³ of load space represents a capacity to carry 20 double-set tunnels, or 25 single-set cubbies. The pick-up trucks have a smaller load space (approximately 1.5 X 1.5 metres in area) and are capable of carrying up to 24 double-set, or 42 single-set cubbies each. The trailers will additionally fit at least 24 double-set, or 36 single-set cubbies, loaded 4 tunnels deep. In the mop-up stages of the operation, the trapping team will share the use of these vehicles with the team of conservation dog handlers, and crates for the safe transport of dogs may be fitted in the back of the vans and/or pick-ups. The other ONWP staff have access to an additional four vehicles and will be using these to carry out their work.

During the initial phase of establishing the trap network, the operational team will use the crew vans and trailers attached to pick-up trucks, loaded with traps (with each crew van carrying an estimated 100 single-set cubbies, or 80 double-set cubbies, and each pick-up with trailer carrying at least 48 double-set or 78 single-set cubbies each) to distribute the traps across the eradication area. A 100 traps will serve approximately 830 ha of land, and a team of five trappers is expected to manage this in one full day. Two trap setting teams of five can operate simultaneously, covering up to 1,600 ha of land each day, although parts of West Mainland may take longer due to limited road coverage. In the moorland areas of West Mainland, the teams may have to use ATVs and trailers to transport traps away from the surfaced roads. Additional logistical support for trap distribution may be available and can be arranged for if required.

The trapping foremen will be responsible for planning the logistics of the trap checks during the knock-down phase, and trap checks and dog searches during the mop-up phase.

8 EQUIPMENT LIST

The Project Manager will be responsible for the procurement of all equipment and materials required by the operation. Section 10 of this plan provides details on the timing of procurement for essential equipment. Sufficient lead-in time should be allocated for the procurement of the traps in particular, and advance notice of the order should be given to the manufacturer. The construction of the trap housing will require a substantial lead-in time, and multiple suppliers should be used. The operational equipment budget is outlined in Annex IX. of this plan. Links to websites of New Zealand based companies supplying traps and surveillance equipment can be found here: <https://predatorfreenz.org/tools-resources/trapping-best-practice/where-to-buy-equipment/#traps>.

Table D: The essential equipment list for the eradication of stoat *Mustela erminea* from Orkney Mainland and the linked isles

Item	Source	Ready? (Y/N)
Field team equipment and operational base		
PPE for all field staff: waterproof clothing and footwear, thermal base layer etc.	TBC	
Vehicles (X6)	TBC	
ATV with trailer (X2)	TBC	
Trailer for transporting ATV (X2)	TBC	
SPOT trackers and annual subscription (X15)	TBC	
Laptops (X8)	TBC	
Office furniture	TBC	
Dog kennels (X6)	TBC	
Mobile phones and contracts (X15)	TBC	
Large chest freezer for storing stoat carcasses	TBC	
Biohazardous waste bin	TBC	
Establishing trapping grid		
GPS (x15)	TBC	
Carry-packs (X10)	TBC	
DOC150 and DOC200 traps (X14,000)	Pest Control Solutions (New Zealand) CMI Springs (New Zealand)	

	Haines Pallets (New Zealand) Perdix Wildlife Supplies (UK)	
Wooden trap housing (X9,424)	Carpenters in Orkney and mainland Scotland	
Trap baiting and servicing		
3-month supply of fresh bait (rabbit, egg, beef offcuts etc.)	TBC	
3-month supply of long-life bait (salted rabbit, dried rabbit etc.)	Pest Control Solutions (New Zealand)	
Stoat lure	Goodnature Traps UK supplier Bushwear (UK) Pest Control Research (New Zealand) Pest Control Solutions (New Zealand)	
Trap maintenance kits (X12)	TBC	
Bio-hazardous waste disposal bags (X2,400/year) and bins (X6)	TBC	
Cool box for stoat carcasses (X6)	TBC	
Dog searches and mop-up		
Muzzles (X6), ONWP conservation dog vest (X6), collars and leads (X6), crates (X6)	TBC	
Air pistol (X15)	TBC	
Goodnature A24 traps (X1,000)	Goodnature Traps UK supplier	
Gas cylinders for A24 traps (X6,000)	Goodnature Traps UK supplier	
Biosecurity		
DOC150 and DOC200 traps with housing (X4,500)	Pest Control Solutions (New Zealand) CMI Springs (New Zealand) Haines Pallets (New Zealand) Perdix Wildlife Supplies (UK) Carpenters in Orkney and mainland Scotland	
Tracking tunnels (X1,500)	Pest Control Research (New Zealand)	

	Key Industries Ltd. (New Zealand) Gotcha Traps Ltd. (New Zealand)	
Ink cards for tracking tunnels (X20,000)	Pest Control Research (New Zealand) Pest Control Solutions (New Zealand) Gotcha Traps Ltd. (New Zealand)	
Trail cameras (X250)	TBC	
SD cards (X500)	TBC	

9 OPERATIONAL TEAM

The Operational Team forms part of the wider Orkney Native Wildlife Project team, which together work on a host of activities designed to deliver conservation benefits to Orkney's native wildlife and to enhance people's connection with nature in Orkney. The Operational Team outlined in this section is directly involved in delivering the stoat eradication operation and the biosecurity activities. The eradication operation will be supported by a stoat and native wildlife monitoring programme, delivered by volunteers and seasonal research assistants.

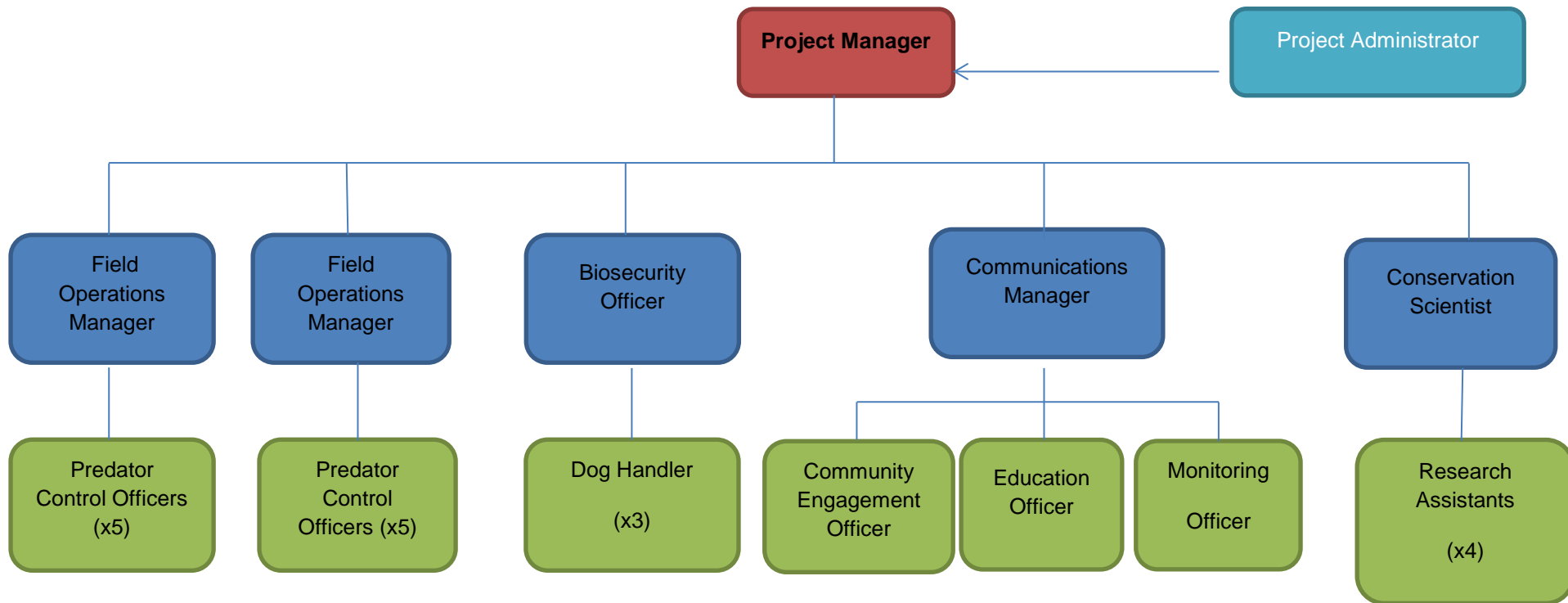
Table E: The Operational Team, the organisations involved, and their roles and responsibilities for the delivery of the eradication of stoat *Mustela erminea* from Orkney Mainland and linked isles.

Name	Organisation	Role	Responsibilities
Sarah Sankey	RSPB	Lead Officer	<ul style="list-style-type: none"> Form the Steering Group Accountable to the Partnership Board for the success of the Project Has the delegated authority to direct the Project within the tolerances set by the Partnership Board Leading the Project Team, through the Project Manager, to deliver the agreed outputs and meet the agreed objectives and desired outcomes Set tolerances for each stage of the Project Communicate with stakeholders as defined in the Communications Plan (including briefing the Partnership Board on progress in the form of approving monthly Highlight Reports to the Partnership Board) Communicate with and facilitate receiving advice from the Technical Advisory Group Provide overall guidance and direction to the Project, ensuring it remains viable, achievable, desirable, and within any specified constraints Respond to requests for advice from the Project Manager Ensure that risks are being tracked and managed as effectively as possible Approve changes outside tolerances set for Project Manager. Make decisions on escalated issues and escalate issues to the Partnership Board when required Line manage the Project Manager (Lead Partner)
Graham Neville	SNH	Lead Officer	
Stuart West	OIC	Lead Officer	
Kirsty Nutt	RSPB	Senior Supplier	
Laura Bambini	RSPB	Senior Supplier	

TBC	RSPB on behalf of the ONWP partnership	Project Manager	<ul style="list-style-type: none"> • Responsible for the day to day running of the Project on behalf of the Steering Group • Ensure Project delivery within the specified tolerances of time, cost, quality, scope, risk and benefits • Compilation of monthly highlight reports and funder reports • Lead and motivate the Project team • Ensure that behavioural expectations of Project team members are established • Manage the information flows between the directing and delivering levels of the Project • Take responsibility for the correct and most effective use of resources and initiating corrective action where necessary • Owner of the equipment inventory • Establish and manage the Project's procedures — risk management, issue and change control, and communications • Establish and manage the Project controls - monitoring and reporting • Authorise delivery of Work Packages agreed by Steering Group • Support function to Partnership Board including paper preparation and minute taking
TBC	RSPB on behalf of the ONWP partnership	Communications Manager	<ul style="list-style-type: none"> • Responsible for project communications plan and delivery • Leads on all media and communications related activities including press releases, newsletters, articles, leaflets, posters, videos, social media etc. • Oversees all people engagement aspects of the project, designed to gain and maintain high levels of community support and participation in the delivery of the project
TBC	RSPB on behalf of the ONWP partnership	Community Engagement Officer	<ul style="list-style-type: none"> • Responsible for delivery of community events, workshops and training events • Supporting the land access working group and engagement with landowners
TBC	RSPB on behalf of the ONWP partnership	Field Operations Manager (X2)	<ul style="list-style-type: none"> • Team leaders of the stoat eradication operation • Lead and motivate the trapping team • Securing and maintaining land access agreements and liaising with landowners • Co-ordination of the eradication operation on the ground

			<ul style="list-style-type: none"> • Participate in the land-access working group • Involvement in public events, incl. training volunteers to trap and monitor stoats • Responsible for maintenance of accurate data of the eradication operation • Reporting to Project Manager on the progress of the operation; compilation of weekly update reports • Liaise with dog handlers to coordinate responses to stoat sign found during the mop-up phase of the operation • Contribute to operational reviews
TBC	RSPB on behalf of the ONWP partnership	Trapper (X10)	<ul style="list-style-type: none"> • Securing and maintaining land access agreements. • Liaising with landowners • Establishment and maintenance of the trap network • Regular trap checks and eradication data collection • Operating firearms to humanely dispatch stoats • Three will go on to handle dogs and receive training later in the project
TBC	RSPB on behalf of the ONWP partnership	Biosecurity Officer	<ul style="list-style-type: none"> • Responsible for delivering all biosecurity activities • Development and implementation of community-led biosecurity plans (via training and workshops) • Operating stoat surveillance networks on non-linked isles • Maintenance of a stoat incursion response database and establishment of an incursion response Task Force • Leading a Biosecurity Working Group • Leading on the production of a Biosecurity Plan for Orkney
TBC	RSPB on behalf of the ONWP partnership	Dog handler (X3)	<ul style="list-style-type: none"> • Support for the stoat eradication operation and biosecurity activities, including advocacy work as required. • Handling and continued training of conservation sniffer dogs for stoats, humane dispatch of stoats that are found • Entering and submitting stoat sign location data to a GIS supported database; close liaison with the trapping foremen to coordinate responses to stoat sign found during the mop-up phase

Staffan Roos	RSPB	Senior Conservation Scientist	<ul style="list-style-type: none"> Responsible for designing and co-ordinating all raptor, seabird, wader, vole and stoat data collection. Analysis of past data and annual data to create trends, technical reports and papers for scientific journals. Facilitation of studentships. Analyses of eradication data to inform adaptive management
TBC	RSPB on behalf of the ONWP partnership	Field officer (X4)	<ul style="list-style-type: none"> Responsible for carrying out pre-eradication surveys of priority native wildlife species and monitoring activities to assess project impact on native wildlife and ecosystem recovery following the removal of stoats Inputting data during and after field season, preparing data for analysis
TBC	RSPB on behalf of the ONWP partnership	Administrator	<ul style="list-style-type: none"> Administrative support for the Project Manager and other project staff Keeping and submitting records of project spend as necessary (financial claims).

Project Team structure

10 TASK SCHEDULE

This operation consists of a Planning Stage, Pre-Operation Stage, Operational stage and the long-term biosecurity legacy in place and maintained in perpetuity at the completion of the stoat eradication operation. The Project Plan provides greater detail on the Planning and Pre-Operation stages, and identifies STOP/GO points during this stage. Once the project completes all tasks and steps in these stages of the operation, and the Operational stage formally begins, the STOP/GO points are defined through the active adaptive management process detailed in Annex II. of this plan and in Section 3.1 of the Project Plan. Key milestones of the operation are listed in Table F. below. The operation must go through all steps detailed for each of the stages, and each milestone must be met by the date set below. If milestones are reached ahead of schedule, and each step in a stage has been completed, the operation can move on the next stage ahead of the planned date.

Table F: A checklist of key tasks for the delivery of the eradication of stoat *Mustela erminea* from Orkney Mainland and the linked isles.

Key task	Completion date	Responsible	Completed? (Y/N)
Operational Planning Stage			
Project Plan finalised	31/07/2018	Seabird Recovery Officer	
Operational Plan finalised	31/07/2018	Seabird Recovery Officer	
Funding secured	By 31/08/2018	Orkney Manager, Operations Manager	
Operational Plan reviewed by IEAG	30/09/2018	Seabird Recovery Officer	
Project Manager recruited and in post	30/10/2018	Orkney Manager, Operations Manager	
Pre-operation phase			
Tendering process for training and supply of 3 conservation dogs completed; contractor selected. Dogs acquired by 31/01/2019 and available in 2020.	30/11/2018	Seabird Recovery Officer	
Biosecurity Officer and Community Engagement Manager recruited and operational	31/12/2018	Orkney Manager, Operations Manager	
Trapping team and foremen recruited and operational	31/12/2018	Project Manager	

Land-owner access permissions secured	31/01/2019	Project Development Officer and Conservation Officer, then Community engagement manager	
Eradication database set up	31/01/2019	Project Manager	
Operational Base established	31/03/2019	Project Manager	
All equipment (50% of traps and housing, PPE, vehicles, 6-month supply of lure, laptops, GPS etc.) purchased, received and ready for deployment; all traps and housing ordered and in production.	31/04/2019	Project Manager	
Remainder of traps and housing received and ready for deployment	30/06/2019	Project Manager	
Pre-eradication readiness check	30/08/2019	IEAG	
Operational phase			
Land access details finalised and agreed	30/06/2019	Trapping team	
3-month supply of bait obtained	30/06/2019; 15/09/2019; 15/12/2019 etc.	Trapping foremen	
Tendering process for training and supply of 3 additional conservation dogs completed; contractor selected	30/09/2019	Project Manager	
Trap lines established and traps placed and pre-baited	30/09/2019	Trapping team	
All traps set and operational	30/10/2019	Trapping team	
First round of trap checks completed	21/11/2019 with checks completed every 3 wks thereafter	Trapping team	
First monthly report submitted to Project Manager	31/11/2019 and at the end of each month thereafter	Trapping foremen	
Dog handlers recruited and in post	31/05/2020	Project Manager	

First 6-monthly report submitted to Project Board and TAG	30/05/2020 and annually thereafter	Project Manager	
First operational review completed	30/06/2020 and annually thereafter	TAG	
Dog team operational	31/07/2020	Project Manager	
Second 6-monthly report submitted to Project Board and TAG and IEAG	31/12/2020 and annually thereafter	Project Manager	
Three trappers selected to become dog-handlers	31/12/2020	Trapping foremen	
Second operational review completed	31/01/2021 and annually thereafter	TAG and IEAG	
Trapper-handlers trained and paired with conservation detection dogs	31/05/2021	Project Manager	
Sustainability			
Surveillance and biosecurity traps deployed on high-risk islands	31/03/2019	Biosecurity Officer	
Biosecurity working group established	30/06/2019	Biosecurity Officer	
Biosecurity workshops delivered to inhabited islands	30/06/2020	Biosecurity Officer	
Second round of biosecurity workshops delivered community-led, island-specific biosecurity plans in draft	30/06/2021	Biosecurity Officer	
Orkney Islands Incursion Task Force in place	30/06/2022	Biosecurity Officer	
Community-led biosecurity plans finalised	30/06/2022	Biosecurity Officer	
Orkney Biosecurity Strategy finalised and long-term funding and resourcing committed	31/07/2023	Biosecurity Officer	

Table G: The task schedule for the delivery of the eradication of stoat *Mustela erminea* from Orkney Mainland and linked isles.

Activities	2018		2019				2020				2021				2022				2023			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Operational Planning Stage																						
Project Plan finalised																						
Operational Plan finalised																						
Funding secured																						
Operational Plan reviewed by IEAG																						
Project Manager recruited																						
Pre-operation phase																						
Contractor selected for training and supply of 3 conservation dogs																						
Biosecurity Officer and Community Engagement Manager recruited																						
Trapping team and foremen recruited																						
Land-owner access permissions secured																						
Eradication database set up																						
Operational Base established																						
All equipment purchased, 50% of traps																						

received and ready for deployment																					
All traps ready for deployment																					
Pre-eradication readiness check																					
Operational phase																					
Land access details finalised																					
3-month supply of bait obtained																					
Contractor selected for training and supply of 3 conservation dogs																					
Trap lines established and traps placed and pre-baited																					
All traps set and operational																					
First round of trap checks completed																					
First monthly operational report																					
Dog handlers recruited																					
6-monthly operational review by TAG																					
Dog team operational																					
Annual operational review by TAG and IEAG																					
Trapper-dog-handlers selected																					
Trapper-dog team operational																					
Sustainability																					
Surveillance and biosecurity traps																					

deployed on high-risk islands																						
Biosecurity working group established																						
Biosecurity workshops delivered to 10 inhabited islands																						
Second round of biosecurity workshops delivered and 10 community-led, island-specific biosecurity plans in draft																						
Orkney Islands Incursion Task Force in place																						
Community-led biosecurity plans finalised																						
Orkney Biosecurity Strategy finalised; funding and resourcing committed																						

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12 ANNEX I: Recommendations from Bell *et al.* 2018

Accepted recommendations	
1	The ONWP Project Manager position is filled as soon as possible
2	The three ONWP community liaison positions are filled as soon as possible
3	The Biosecurity Officer position is filled as soon as possible
4	The three stoat detection dogs are purchased, trained and in place as soon as possible
5	The three ONWP Biosecurity Dog Handler positions are filled as soon as possible
6	Alternative funding options are identified in case current funding streams are unsuccessful or funding secured to date is insufficient to cover the project costs
7	Consultation with the Orcadian community be continued to identify all interest groups and identify issues that the public may have regarding the eradication
8	All landowners are identified to enable the land access agreements to be completed
9	All islands in the Orkney Islands are assessed and monitored for stoats during the operation and factored into the eradication phase if detected
10	Key native species are monitored to detect and quantify any impacts by stoats prior to, during and after the eradication operation
11	Obtaining the land access permissions from all landowners is critical to the establishment of the trapping grid
12	Establishing the trapping grid will take significant amount of time due to the bulky equipment and access to the grid positions
13	Maintenance or replacement of wooden cubbies will be required during the eradication operation and could be required as often as annually in places where decomposition rates are high (e.g. fertile fields with fluctuating water tables)
14	Traps need to be placed securely (especially along coastal sections) and where possible, away from livestock
15	Fresh meat (ideally rabbit in the first instance) is used as the primary bait during the eradication, but that alternative baits and lures should be used on occasion to ensure individual taste and behaviour in stoats is catered for
16	The trapping team carry gloves, biological hazard bags for cleaning traps and collecting decomposing animals and a bucket for storage of all material until disposal is possible
17*	A suitable method for cleaning the traps in the field is developed
18*	The trapping trial is continued to provide further data on trapping and baiting methods that affect the efficacy of the eradication

19	Double-trap sets are used as the main trap type during the eradication operation
20	The cubby design is modified to reduce weight, vibration when traps are triggered, avoid non-target captures and non-clean captures of stoats. It will be important to assess whether this will result in the need for a derogation.
21	The bait is placed in bait cages (wire mesh cages) to reduce the chance of scavenging by smaller mammals (such as rats, mice or voles)
22	Deactivated Goodnature A24 traps are trialled in a wider range of habitats to determine the level of stoat interaction with these traps
23	If Goodnature A24 traps are approved for use for stoats in Scotland, a trial using live traps is also completed
24	An adaptive approach is taken for the Orkney Native Wildlife Project
25	Sufficient time is provided for the planning, research and implementation phases
26	Research into stoat behaviour and trap-ability is conducted prior to the eradication and that trap rates are monitored throughout the operation to allow for adaptation of techniques
27	The trap density is sufficient to target female stoats
28	Trap density is set between 200 and 350 grid but trap sets are placed along linear features likely to be utilised by stoats
29	Wooden cubbies are used as the main cover, but alternatives should not be discounted as the eradication
30	<i>That a derogation application is completed for the use of run-through cubbies as this could prove to be a very effective method when stoat numbers have been reduced on the Orkney Islands</i>
31	A variety of baits and lures are used. New developments in bait types and lures should be monitored and utilised as appropriate throughout the eradication
32	A well-managed, small and dedicated team of trappers is used
33	The impacts of stoats on the key native wildlife species (waders, hen harrier, Orkney vole) of Orkney distribution, abundance or breeding success is investigated and compared pre and post eradication to determine the impacts stoats may (or may not) have had on these species
34	The possible impacts (e.g. water supplies, farm management, poultry, pets, etc.) on the human population on the Orkney Islands is investigated
35	<i>That all research into stoat ecology and behaviour should be completed prior to, or concurrently with, the implementation of the stoat eradication phase of the Orkney Native Wildlife Project</i>
36	The ONWP Project Manager is only responsible for the ONWP as this project will require their complete commitment and concentration
37	The ONWP Project Manager is responsible for purchasing all major equipment, including traps

38	The landowners and property boundaries are identified and mapped
39	The landowner agreements are finalised, discussed and agreed with each landowner and signed
40	The land access agreements are reviewed periodically to ensure there have been no changes to the land use, tenancy or ownership, resolve any concerns, or updated requirements for the ONWP and contractor personnel when on specific land
41	The ONWP communication plan outlines how the ONWP team will manage ongoing communication and engagement with landowner for the duration of the eradication operation and overall project
42	The dog training is completed immediately to allow the dogs to work on the Orkney Islands when stoats are present and can be used to implement biosecurity immediately
43	The dogs are used to monitor outer islands and to test and implement biosecurity strategies as part of the wider eradication operation
44	The ONWP dog handlers liaise with the ONWP contractor to assist with the additional monitoring during the implementation of the eradication operation
45	All the planning actions have been completed by the ONWP Project Manager and other ONWP team members prior to the implementation phase
46	The ONWP steering group review all documentation of the project including operational plan, progress reports, methodology reviews, and scientific papers
47	All ONWP steering group meetings have detailed minutes recorded and action logs to ensure tasks are completed promptly
48	TAG meets every 6 months during the planning and implementation phases to discuss results and methodology to date and advice on any adaptations as recommended by the contractors or ONWP team
49	The TAG reviews all documentation of the project including operational plan, progress reports, methodology reviews, and scientific papers
50	All TAG meetings have detailed minutes recorded and action logs to ensure tasks are completed promptly
51	The stakeholders for the ONWP are identified and included immediately into the project consultation process
52	The ONWP community liaison personnel ensure all stakeholders are regularly updated as the eradication progresses
53	All permits and approvals are obtained by the ONWP Project Manager prior to the implementation phase
54	The land access agreements cover trapper access, stoat-detector dog access, any required quarantine actions and special requests by specific landowners

55	The land access agreement documents are finalised, reviewed by legal representative and approved for use as soon as possible but that there is scope for special requests or actions to be added for specific properties
56	The ONWP community liaison personnel consult with landowners in regard to land access agreement information and any issues prior to the eradication commencing with the assistance of social scientists
57	The land access permissions are finalised following discussions about final trap placement and any special requirements per property
58	All aspects of the project requirements and land access are clearly discussed with each landowner during the process of obtaining land access agreements
59	Each landowner receives a copy of their individual land access agreement
60	Communication between the ONWP community liaison officer and the ONWP contractor and all landowners is maintained
61	The land access agreements are in place prior to the traps being placed and the final placement of traps is discussed with the landowners by the trappers
62	The trapping grid is established over the whole area before trapping begins
63	Traps are pre-baited when established to allow stoats to become habituated to entering the trap boxes
64	There is clear data collection, storage, management and analysis protocol in place for the data collected during the eradication
65	There is clear identification which group collects which data set (i.e. trapping, monitoring, research, biosecurity, citizen science etc.)
66	The data collection systems are agreed, i.e. notebooks, datasheets, electronic devices, automated trap devices etc. for field data and that these systems are tested, and relevant protocols established prior to the eradication project
67	Data are entered regularly into the agreed system and shared between all parties to allow for analysis and communication
68	The communication plan is finalised, reviewed and approved prior to the implementation phase
69	There are regular briefing/debriefing meetings [<i>between the ONWP team and contractors</i>]
70	The ONWP Health & Safety Plan and detailed Risk Assessment is written by the ONWP Project Manager and is reviewed, finalised and approved by relevant project partners' H&S advisors prior to the implementation phase
71	All forms of waste are identified and disposal options for each is identified
72	Orkney Islands Council is approached for advice in regard to waste facilities and capacity on the Orkney Islands and options for disposal during the eradication
73	Detailed waste management plan is prepared, finalised and approved by ONWP prior to the implementation phase

74	At least four project vehicles are purchased for the Project Manager, ONWP community liaison officers and the ONWP biosecurity officer and ONWP dog handlers
75	These vehicles are branded with the project logo
76	Local boat men are used to access the 'stepping stone', 'outlying' and possibly 'distant' islands to complete the trapping and monitoring checks
77	Quarantine measures are followed for access to private land and farms if required
78	Simple quarantine measures are followed to reduce the risk of transporting invasive mammal, invertebrate and weed species.
79	The biosecurity plan for the Orkney Islands is finalised and implemented prior to the eradication
80	All pre-eradication planning and preparation requirements have been completed prior to the implementation stage
Rejected recommendations	
1	The knockdown period during the eradication be completed in autumn/winter when bait lasts longer and is more attractive, carcasses do not decompose as quickly, and natural food is reduced
2	That good quality high-definition wildlife cameras (with dedicated night-vision lenses) are selected for the monitoring phase of the eradication operation
3	Research into stoat habitat use, ecology and behaviour is completed to understand how they use the Orkney environment
4	DOC200™ are the primary traps used in the eradication
5	Trail cameras are used as a monitoring tool during the eradication
6	Despite not detecting stoats, tracking tunnels are used as a monitoring tool during the eradication. Trials of different tracking tunnel designs should be completed prior to the eradication.
7	The home range of stoats on the Orkney Islands is investigated
8	The seasonal and daily activity patterns of stoats on the Orkney Islands is investigated
9	Prey availability and prey preference of stoat on the Orkney Islands is investigated
10	Dietary preferences between males and females are investigated
11	The habitat preferences and habitat use by stoats in Orkney is investigated
12	Stoat prey abundance in Orkney is investigated
13	The breeding biology and population dynamics of the stoats on Orkney are investigated
14	The relationship between stoat diet and how that may affect current predator/prey relationships on the Orkney Islands is investigated

15	Other mammal species (rabbit, rat, cat) distribution and abundance is investigated and compared pre and post eradication to determine the impacts of removing stoats from the Orkney Islands has on these species
16	An expression of interest for the Orkney Native Wildlife Project: Stoat Eradication Implementation is advertised to determine the interest and capacity of contractors available for the operation
17	The formal tender is advertised as soon as possible following the completion of specific planning actions
18	The tender clearly states the work requirements, responsibilities, preferred timetable, and any other requirements for the contractor role
19	The contractor has capacity for stoat detection dog handlers and firearms specialists in their team
20	The contractor provides their own vehicles as part of the tender process. If these must be branded with the project logo, this should be a condition in the tender documentation
21	The ONWP steering group meets every 3 months during the implementation phase to discuss results and methodology to date and advise on any adaptations as recommended by the contractors or ONWP team
22	The ONWP project manager prepares quarterly reports on the progress of the operation, risk updates, and project outputs and deliverables, including action points from previous meetings
23	The Orkney islands are split into three Mainland zones (1, 2 & 3), 'stepping stone' islands, 'outlying' islands and 'distant' islands
24	The grid spacing in the three Mainland zones averages 250 m (a network of 16 traps/km ²) using DOC200™ double-trap sets, in wooden cubbies in the first instance
25	The grid spacing in the 'stepping zone' and 'outlying' islands may be the same (a network of 16 traps/km ²) using DOC200™ double-trap sets, in wooden cubbies but could vary locally depending on the application
26	Monitoring will be set up concurrently [to the establishment of the trapping grid] to record a baseline of stoat activity prior to knock-down
27	The monitoring system (primarily trail cameras) is put in place when the traps are established
28	The knockdown phase in each area is completed from November-April and an initial monitoring/mop-up phase is then completed in the following May-October, before moving to the next mainland zone
29	Application for alternative cubby designs, including run-throughs, plastic, mesh and aluminium, should be made through the derogation process
30	The contractor has an effective communication plan as part of their operational procedures (which is outlined in the tender process and tested in Orkney prior to the implementation phase)

31	The contractor has an effective Health & Safety plan and detailed risk assessment as part of their operational procedures (which is outlined in the tender process and approved by the ONWP Project Manager and ONWP Partnership Board prior to the implementation phase
32	The contractor provides their own vehicle requirements, but if these must be branded as project vehicles, that this must be a condition in the tender process
33	Helicopters are used to transport traps and cubbies around the islands to assist with establishment of the trapping grid

13 Annex II: Project approach

Pre-eradication phase: stopping points

The Orkney stoat eradication operation will require an extensive period of planning and preparation. During this time, funding for the entire eradication operation must be secured, including a generous contingency budget (in keeping with best practice). The eradication area is set to cover the Orkney Mainland and linked islands of South Ronaldsay, Burray, Lamb Holm, Glimps Holm and Hunda. Any stoats found on the non-linked islands of the archipelago will be addressed through incursion responses during the pre-eradication phase. Where incursion responses are unsuccessful at removing stoats from these islands, or if it is discovered that stoats have become established and an extensive eradication campaign would be required to remove these satellite populations, the ONWP will request access to the Project Risk Budget to assess the feasibility of eradication, and to plan and carry out the operation. This approach is taken because the planned eradication operation on Orkney Mainland and linked isles does not have sufficient resource redundancies built into it to accommodate a significant increase in the eradication land area, and any eradication taking place on one (or more) of the non-linked isles would require a separate base and operational team to be established there. Managing two operational bases, two eradication teams, and two (or more) eradication operations (that may be in different phases of implementation) under one programme would introduce significant logistical and operational challenges. To reduce and manage the risk of stoats spreading further during the pre-eradication phases, and once the eradication is underway on Orkney Mainland and linked isles, robust biosecurity measures will be in place across the archipelago. These measures include regular checks carried out by conservation detection dogs, containment trapping on Orkney Mainland (until the eradication trapping begins), and 'buffer-zone' trapping on coastal areas of high risk non-linked islands and across the stepping stone islands.

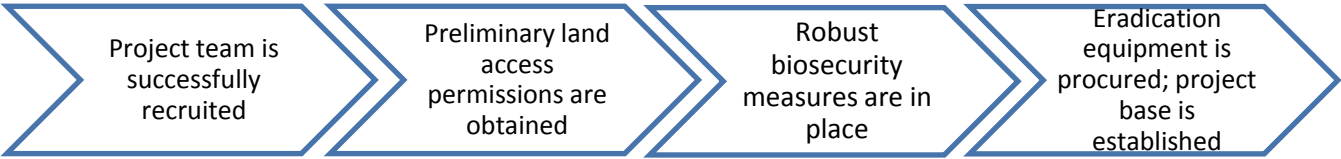
The eradication operation will be carried out simultaneously across the entire land area of the Orkney Mainland and linked isles, as recommended by Harper (2017a). The operation is expected to last up to 5 years, including a knock-down phase of no more than 3 years and a mop-up phase of at least 2 years. During the knock-down phase, lethal DOC traps will be the main eradication tool, and during the mop-up phase, conservation detection dogs will be used to carry out extensive searches for surviving stoats. Any surviving stoats will be targeted with as many eradication tools as are available in the UK, currently limited to alternative trap types and DOC traps placed in alternative housing (subject to legal approval), and searching by dogs and shooting. It is recommended that the option of obtaining approvals for the use of para-aminopropiophenone (PAPP) against stoat in Orkney is investigated, giving careful consideration to risks to non-target species. PAPP is a highly effective control agent on cats (*Felis catus*) and stoats, with high susceptibility reported for other carnivores (including dogs *Canis familiaris* and foxes *Vulpes vulpes*) but a high oral LD₅₀ mg kg⁻¹ for other mammals including rodents, and for birds (Baskin and Fricke 1992; Eason *et al.* 2014). This substance is currently not licensed for use as a biocide within the EU (Health and Safety Executive 2018). An adaptive management strategy will be in place for both the knock-down and the mop-up phases of the eradication (see below), and includes 6-monthly reviews carried out by independent experts. In line with an adaptive management approach, these reviews may become more frequent if the operation requires it. A detailed operational plan outlines how the operation will be implemented, and will be kept up-to-date to reflect changes implemented through the review process.

The pre-eradication phase has been split into three stages, each of which contains several 'stop points'. **Each step in a stage must be completed before the operation can progress to the next stage.** The final pre-eradication checkpoint is the Pre-eradication Readiness Check, completed by the Island Eradications Advisory Group (IEAG), a NZ-based independent panel of experts widely accepted as the world leaders in planning and execution of eradication projects on islands. The IEAG will either deem the operational planning and preparations complete/in a sufficiently advanced state for the eradication to start, or will identify outstanding issues and risks and make recommendations on how to address these. Decisions to postpone eradication projects are not uncommon: both the Macquarie Island pest eradication project and the Antipodes Island mouse eradication project were postponed. Both have since been executed and declared successful.

Project stop points – a staged approach leading to a pre-eradication readiness check:

Pre-eradication stage 1: June – October 2018	
<pre> graph LR A[Extent of stoat distribution on high-risk islands is known] --> B[Operational Plan and budget is approved by TAG and IEAG] B --> C[Funding for the full project is secured] C --> D[HRA and environmental assessment are completed] </pre>	
<i>Extent of stoat distribution on high-risk islands is known</i>	<p>Dog-assisted searches are completed on Rousay, Hoy, Graemsay, Flotta, Shapinsay, Wyre and Gairsay by October 2018. If incurring stoats are found, incursion responses are implemented. If the incursion response(s) fail(s) or an established stoat population is found, the project Risk Budget is accessed and an eradication operation is implemented. The start of the Orkney Mainland operation may have to be postponed.</p> <p>STOP POINT 1: If stoats are found to be established on one or more of the non-linked island, the feasibility of eradication must be established and costed, and funding must be secured prior to the Orkney Mainland operation starting. If the eradication or containment of an established satellite population is deemed technically or financially unfeasible and the risk of incursions to Orkney Mainland cannot be effectively mitigated and managed, the eradication should not start and a new feasibility study will need to be commissioned to assess the long-term stoat management options available in Orkney.</p>
<i>Operational Plan is approved by TAG and IEAG</i>	<p>Initial trap density and adaptive management strategies and stop/change points for the operation are established. Bait and lure types to be used are identified. A robust and fully costed operational plan is produced for the eradication and approved by the project TAG and reviewed by the IEAG by August 2018.</p> <p>STOP POINT 2: If an Operational Plan is not approved and there is no agreement on the methodology that has the greatest chance of delivering a successful eradication, the start of the eradication operation should be delayed and the writing of a new operational plan should be commissioned.</p>
<i>Funding for the full project is secured</i>	<p>Grant funding from LIFE and HLF is confirmed by September 2018; commitment to underwrite funding shortfall is secured; commitment to funding for project risk budget is secured.</p> <p>STOP POINT 3: The eradication will only start once funding is in place for the entire operation. If the start of the eradication is delayed beyond 2019, greater investment in biosecurity and containment trapping must be made immediately to reduce the risk of stoats spreading across the entire Orkney archipelago.</p>
<i>HRA and environmental assessment are completed</i>	<p>An HRA is completed in September 2018 and concludes that the operation will not put Natura2000 features at risk and/or will not have an unfavourable impact on their conservation status, and will result in an overall conservation benefit to native wildlife in Orkney. The</p>

	environmental assessment determines that the level of non-target impact is within acceptable limits and will not have negative impact on populations of native wildlife. Historic Environment Scotland (HRE) is consulted on the potential impact to scheduled monuments and World Heritage Sites. The operation can be completed without causing harm or damage to the historic environment in Orkney, including any designated sites and scheduled monuments, and measures are in place to avoid or mitigate any impact.
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Pre-eradication stage 2: November 2018 – June 2019	
	
<i>The project team is successfully recruited</i>	Project manager, biosecurity officer, communication manager and officers, trappers and trapping foremen in post by January 2019; Dog handlers recruited later (May 2020)
<i>Land access permissions are obtained for the entire land area</i>	Land-owner details are obtained for the entire Orkney land area and stored and managed in compliance with GDPR by September 2018. All land-owners have been contacted by October 2018 to seek and obtain (by January 2019) signed land access agreements. Face-to-face discussions with land-owners start in February 2019. STOP POINT 4: If land access permissions are not in place by January 2019, the eradication operation can not proceed as scheduled and may have to be postponed. Project Manager and the community engagement team will need to continue working to secure land access permissions, which may lead to delays in other work areas of the ONWP, and other ONWP partnership staff may need to step in to assist, which could impact on other work carried out by the partner organisations. A social scientist should be engaged at this point, if not before, in the work to resolve the issues.
<i>Robust biosecurity measures are in place</i>	Biosecurity traps are placed on high-risk islands to target incurring stoats by March 2019; surveillance measures are in place and checks are carried out; biosecurity awareness is raised; Orcadians are encouraged to remain vigilant and report stoat sightings
<i>Eradication equipment is procured; project base is established</i>	All traps and housing are ordered by December 2018; 50% of traps and housing are ready by April 2019, with 100% of traps and housing ready for deployment by July 2019. Several reliable sources for bait and lure identified by April 2019.

Pre-eradication stage 3: July – September 2019	
<pre> graph LR A[Land-owner access permissions are finalised] --> B[Extent of stoat distribution in Orkney is known] B --> C[Pre-eradication readiness check is completed by IEAG] C --> D[Schedule 1 licenses are obtained (if required)] </pre>	
<i>Land-owner access permissions are finalised</i>	<p>Land access agreements are finalised by completion of detailed access maps through discussions with individual land-owners, for the entire Orkney land-area by end of July 2019.</p> <p>STOP POINT 5: If land access permissions are not secured and/or the project meets resistance and stakeholders do not support sufficiently the project objectives and plans for the eradication, the eradication can not proceed as scheduled. Investment in biosecurity and containment trapping must be maintained or increased, and further community consultation work must be carried out to develop greater consensus and support for the eradication.</p>
<i>Extent of stoat distribution in Orkney is known</i>	<p>A second contract is issued to carry out dog-assisted searches to confirm presence/absence of stoats on all inhabited non-linked islands and high-risk uninhabited islands in Orkney by end of July 2019.</p> <p>STOP POINT 6: Same as STOP POINT 1 above.</p>
<i>Pre-eradication readiness check is completed by IEAG</i>	<p>The check is completed by August 2019 to assess progress in carrying out preparatory tasks, and to assess whether the project has addressed issues raised, and mitigated the known risks to eradication success.</p> <p>STOP POINT 7: If the IEAG deems the preparations and progress insufficient, or identifies any change or obstacle to the feasibility of the operation, the eradication can not proceed as scheduled and the IEAG recommendations should be followed.</p>
<i>Schedule 1 licenses are obtained (if required)</i>	<p>Disturbance licences may be required if any breeding birds on Schedule I are likely to be affected by the operation. A licence must be in place by March 2020 (unless the operation starts before/during the 2019 breeding season).</p>

Dealing with uncertainty: adaptive management

Because the legally available control methods for stoat are limited in the UK, the primary methods used by this operation are trapping and dog-assisted searches to inform spatial focus of the removal effort in the later stages of the eradication. Due to the novelty and scale of this eradication, considerable risks and uncertainties are inherent to the operation. There are additionally significant uncertainties relating to the effectiveness of the available methods in achieving eradication, and the effort and time taken to achieve success.

The management uncertainties this operation is faced with can be summarised as:

1. Does the objective of eradication remain feasible and attainable within the allocated timeframe and resource?
2. Are the available management tools effective?

A formal process of adaptive management can be an effective method of ensuring that management uncertainties are explicit and reduced if possible, and that resources are applied to the best effect (McCarthy and Possingham 2007). Keith *et al.* (2011) defines this process as one that integrates models, active experimentation, monitoring, decision analysis, and a mix of alternative management actions that are developed through a process of 'learning by doing'. Adaptive management approaches have been applied to invasive species control programmes, where the objective is to reduce the impact of an invasive species on native wildlife and a cost-effective management strategy needs to be developed (Brown 2002; Parkes *et al.* 2006; Baxter and Possingham 2011; Bryce *et al.* 2011). However in eradication operations, such as the removal of stoat from Orkney, the primary objective is the total eradication of the target species. Adaptive management experiments are often not possible, as each eradication attempt is unique and success precludes the option to test alternative models (Parkes *et al.* 2006).

Whilst the Orkney stoat eradication is expected to bring long-term benefits to Orkney's native wildlife by removing the threat of stoat predation, due to the relatively recent arrival of stoats in Orkney and the scarcity of reliable population trends or annual productivity data for native species, it can be difficult to ascertain what the actual impact of the stoats currently is on the native wildlife. It would therefore be difficult to determine at this stage what the appropriate level of stoat control would be to achieve the desired conservation impact. Quantifying this may however become necessary at a later date, if the eradication is deemed to fail to meet its primary objective (i.e. the eradication of stoats from Orkney), or if fundamental changes to its feasibility occur during the operation, whether technical, social, legal or financial. Significant effort will therefore be invested in reviewing the progress of the eradication, and adaptive management will be employed to maximise the chances of achieving the objective of safeguarding the Orkney native wildlife from the threat of introduced stoats, whether through eradication of long-term management (i.e. control) of the stoat population.

The key questions this project will address through an adaptive management approach are two-fold:

1. What is the appropriate trapping regime to achieve the primary objective of eradicating stoats from Orkney
2. If the eradication of stoats from Orkney is not achievable, what is the appropriate strategy to achieve the management outcome of conservation benefits to native wildlife

The first of these questions will be addressed through a process of modelling the trapping returns data to determine the most appropriate trapping regime, including siting (microhabitat), trapping density, and trap check frequency. Following from the initial 6-month period of a uniform approach across the eradication area, the project has the option of dividing the eradication area into 'treatment areas' to test the following hypotheses:

H1: Higher trap density results in higher stoat capture rates

H2: Higher trap check frequency results in higher stoat capture rates

For example, trapping density can be increased from medium (12 traps km⁻²) to high (16 km⁻²) in 50% of the eradication area, and each treatment area can be further divided into two areas of differing trap check frequency. It is important that the effectiveness (i.e. outcome) of each management option is monitored carefully (Lyons *et al.* 2008), recording stoat capture rates (as animals caught per unit of trapping effort e.g. 100 trap nights) and where possible, utilising stoat abundance data (e.g. collected

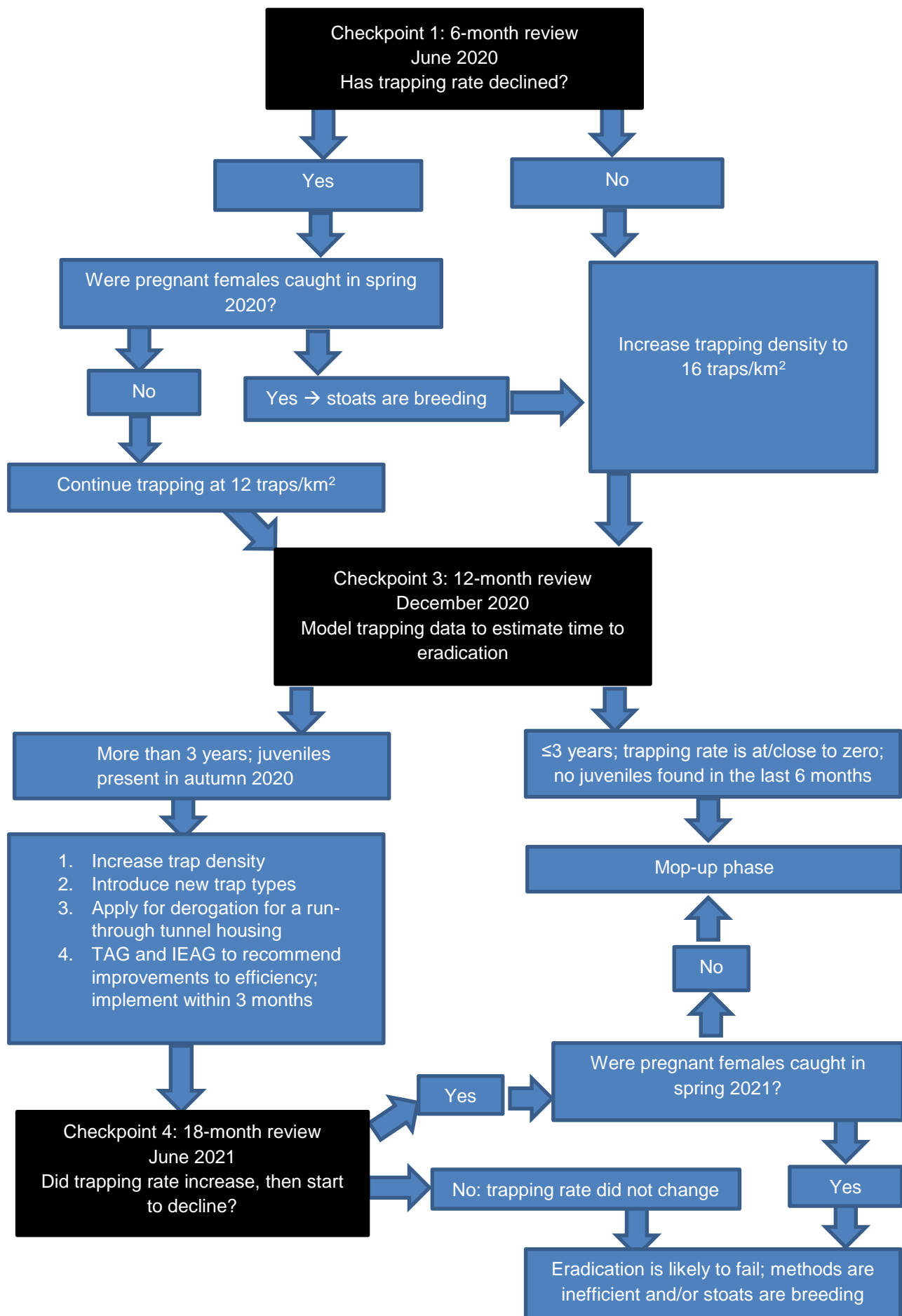
through the ONWP citizen science programme). Other experiments that should be carried out relate to the trappability of individual stoats, i.e. catering for individual preferences in trap placement, bait type, trap housing etc. As wide a range of options should be provided in the mop-up phase of the eradication to target the remaining hard-to-trap or trap-shy individuals. Data collected on catch-rates of individual traps during the knock-down phase will be important in informing these decisions through an improved understanding of general trends in stoat preference (e.g. seasonality in bait choice, habitat use), but experimentation and innovation is called for to target the individuals that have survived the knock-down phase of the operation.

The second question (i.e. determining the appropriate strategy to achieve conservation benefits) can be addressed by modelling stoat trapping data and key native wildlife monitoring data (e.g. Orkney vole index and wader productivity) to assess the conservation impact of different management scenarios: no stoat control (using the pre-eradication 2017-19 baseline data), medium intensity stoat control (12 traps km⁻²) and high intensity stoat control (16 traps km⁻²). If the stoat eradication is deemed unachievable by year 3 of the operation, the trapping area can be further divided into treatment areas where the conservation outcomes of different management scenarios (i.e. stoat control at different intensities year-round, and areas where only seasonal control is implemented) are tested. The selection of an appropriate and cost-effective management strategy in a stoat control (as opposed to eradication) scenario can be further supported by the construction of a demographic population model, based on data collected from the captured stoats. This would necessitate the ageing and sexing of all, or a large proportion of the stoats captured, and can represent a challenge if the carcasses are recovered in advanced state of decomposition. Constructing a demographic model using capture data alone could introduce a bias due to the inherent un-trappability of some individuals.

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Diagram 1. A simplified illustration of how the adaptive management process and decision making in the Orkney Mainland and linked isles stoat eradication could look like.



14 Annex III: DOC trap housing design



These Department of Conservation 'current best practice' tunnel designs must be used with DOC 200 traps. These tunnels are designed to exclude non target species, guide target species and provide public safety.

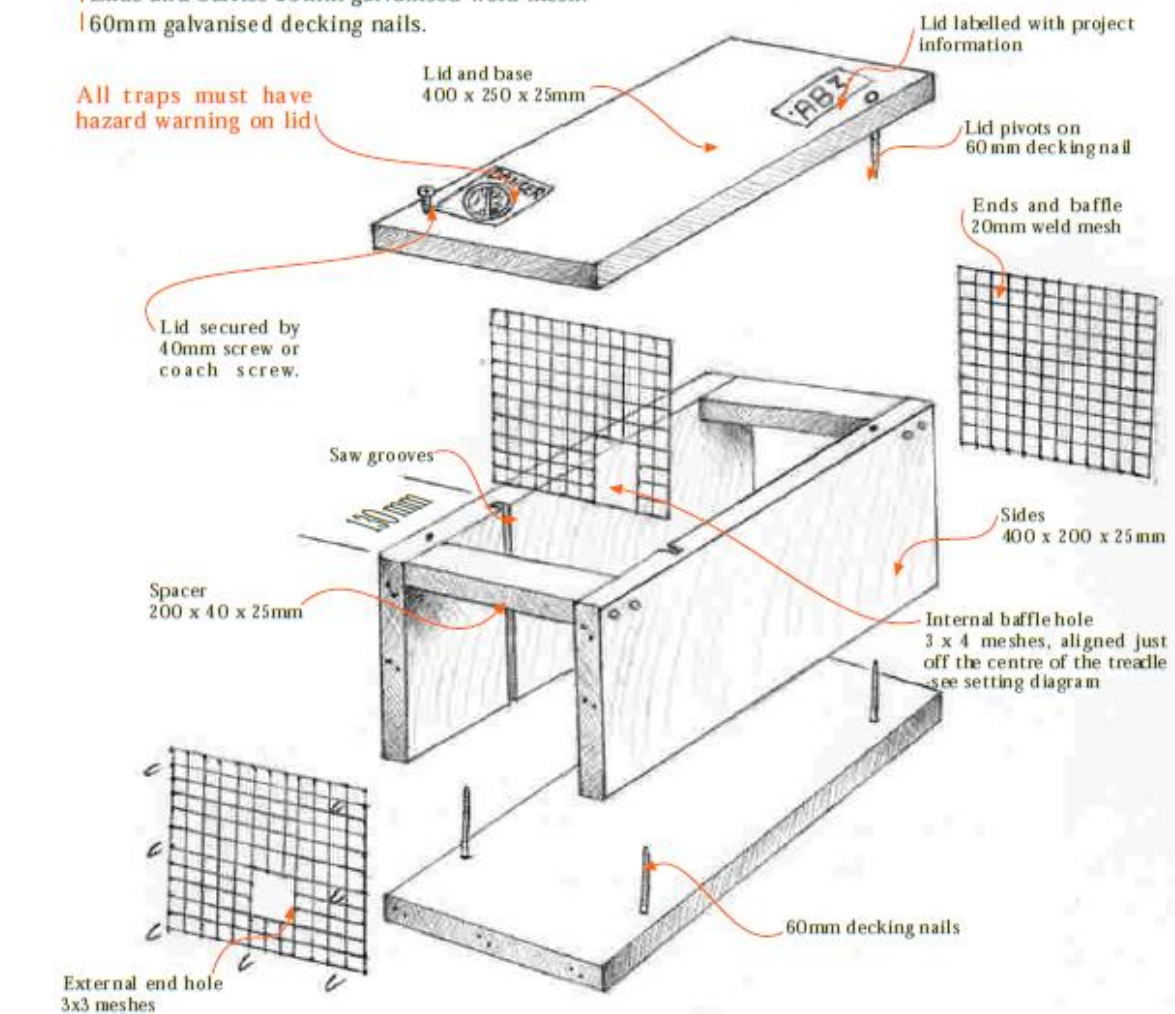
Single set tunnel design.

In areas where weka are present, the tunnel length is 525mm, the distance from the end mesh to the internal mesh increases from 130mm to 255mm.

Materials

- | All timber H4 treated radiata or similar.
- | Ends and baffles 20mm galvanised weld mesh.
- | 60mm galvanised decking nails.

All traps must have hazard warning on lid



Drawings, Phil Waddington

PREDATOR TRAPS

Doc series trapping systems

Doc 200

Stoats
Rats
Hedgehogs



Department of
Conservation
Te Papa Ateneo

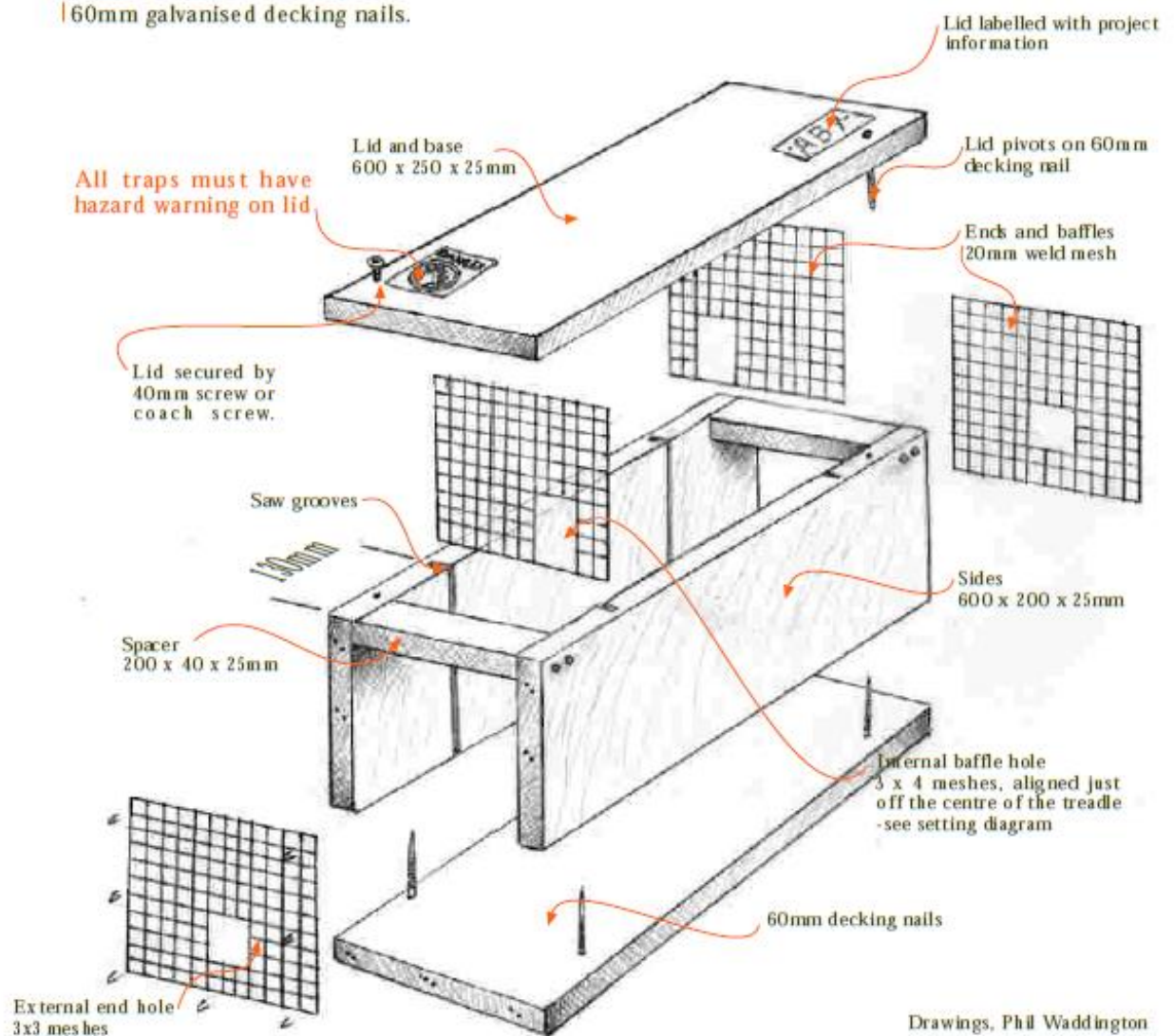
These Department of Conservation 'current best practice' tunnel designs must be used with DOC 200 traps. These tunnels are designed to exclude non target species, guide target species and provide public safety.

Double set tunnel design.

In areas where weka are present, the tunnel length is 950mm, the distance from the end mesh to the internal mesh increases from 130mm to 255mm.

Materials

- | All timber H4 treated radiata or similar.
- | Ends and baffles 20mm galvanised weld mesh.
- | 60mm galvanised decking nails.



Drawings, Phil Waddington

15 Annex IV: Trap label

This label was in use during the trapping trials in 2017-18 and is used on traps used for containment (biosecurity) trapping, and in incursion responses on the non-linked isles in Orkney. This label will be updated with the ONWP logo (once created) and up-to-date contact details.



16 Annex V: Data collection sheet: trapping effort and captures

A sample of the data sheet currently in use during trapping trials in 2018.

Round	Previous check/ install	TRAP NAME	Trap type	GRID REFERENCE	Checked?	Trap status	Last bait used	Bait status	Catch	Gender	Decomp	Strike gap 1	Strike gap 2	Strike gap 3	Strike gap 4	Trap status departure	New bait	Lure used?	Comments
2	25/05/2018	1246	DOC200	HY4202313311	Y	open	cat food	taken	n/a							open	beef	N	
2	25/05/2018	1246	Double set DOC150	HY4202313311	Y	open/closed	cat food	taken	vole		completely	tail	body	head		open	beef	N	
2	25/05/2018	1247	DOC200	HY4233113318	Y	open	/	mouldy	n/a							open	fish	N	
2	25/05/2018	1223	DOC200	HY4235312326	Y	open	/	taken	n/a							open	egg	N	
2	25/05/2018	1223	Double set DOC150	HY4235312326	Y	closed	/	taken	vole s		completely	Body. head	Body. head			open	egg	N	2 vole s in same trap

17 Annex VI: Waste Management Plan

The final waste management plan for the eradication operation is currently in development, and will be based on this options paper:

Orkney Native Wildlife Project – Animal waste / bycatch disposal options paper

Prepared by: Bea Ayling, Conservation Officer, RSPB Orkney

Current process for small quantities (biosecurity trapping and incursion responses)

Chinglebraes waste facility is happy to take up to 5 black sacks of animal waste every few weeks. This goes into their clinical waste container and disposed of through official channels. This is where the geese carcasses on Orkney are disposed of.

SEPA also allows burial of small numbers of rodent carcasses (no more than 10) without the need for a licence or exemption, provided it is done without delay and meets the following requirements:

Carcasses **must not** be buried:

- within 250m of any drinking water supply; or
- 50m from any watercourse; or
- 10m from any field drain

Carcasses **must** be buried:

- no less than 1m in depth
- in dry soil/ground only
- in sites where there is at least 1m of subsoil at the bottom of the pit.

Disposing bycatch from the biosecurity trapping and Rousay incursion response (180 traps) every few weeks at Chinglebraes is currently satisfactory.

However, it is clear that throughout the project development phase (i.e. trapping trial) and into the delivery and full eradication, an approved system for bycatch carcass disposal will be required as there will be too many to dispose of informally. There will be a cost to this.

Background information for larger quantities of bycatch

Expected quantities

Once the eradication is up and running, there could potentially be up to 10,000 carcasses of bycatch that will need to be disposed of monthly.

An average rat weighs 230g. 10,000 of these would weigh 2300kg, therefore, we could be producing over 2 tonnes of animal waste per month.

The trapping trials could potentially produce approx. 70kg per week as there will be 300 traps on the ground.

Regulations/legislation

- Animal By-Product Regulations (Enforcement) (Scotland) Regulations 2013

An “animal by-product” includes virtually every part of an animal that is not meat for human consumption. The basic rule is that animal by-products must be incinerated at properly authorised premises. There are, however, numerous exemptions. Healthy wild animal bycatch are not subject to the requirements of the Animal by Product Regulations unless they are ‘suspected of being infected with diseases communicable to humans or animals’. Brown rats commonly carry leptospirosis which can be transferred to humans. Rats are also classed as vermin.

APHA have confirmed that rats are exempt from these regulations and that rats pose little risk to humans when dead. However we therefore have a duty of care when disposing of them e.g. to avoid pollution of water courses and not leaving them exposed. Although it’s likely our bycatch is non-hazardous biological waste, we should not assume this.

How vets dispose of animal waste in Orkney

All vet waste in Orkney goes to SAC in Thurso for incineration via Northwards who makes the collections and delivers.

Carcasses are stored in large black boxes known as ‘Amazon cases’ or yellow waste incineration bags marked ‘communal cremation’, which are frozen until collection (monthly).

Northwards then drops back the black boxes to the vet’s collection point.

How butchers dispose of animal waste in Orkney

Butchers – Flett’s have a sealed skip on site, £2000 a year, emptied by OIC twice a week. Craigie’s use their own incinerator or pay by weight at Chinglebraes. Williamson’s freeze their waste and ship at £100 per tonne to D&G.

Ali from Williamsons, who is on the Abattoir Committee is looking to set up own incineration at some point in the future and would be happy to discuss options, however, timeframe is not clear.

Aquaculture

There is apparently an incinerator on Orkney belonging to Scottish Sea Farms at East Quoys – we could investigate use of that. But the fact that no other Orkney businesses seem to use it would suggest it’s not an option for us.

Discussion on options for trapping trials and eradication operation

1. Burial pits

There is only guidance available on burial of farm animals and SEPA and APHA would expect us to follow this.

SEPA (Alan Dundas) has provided advice on this option and suggests that the best practical environmental option in Orkney is to bury the carcasses since Orkney is considered a designated ‘remote’ area and due to the circumstances of the project. He pointed us in the direction of the NetRegs website for guidance:

<http://www.netregs.org.uk/environmental-topics/waste/more-waste-materials-a-d/#collapse1926>

Similarly, APHA recommend the disposal of bycatch in burial pits is done in the same way as domestic livestock in a remote area (which can only be done if there is no approved disposal route available). In this regard we should follow the PEPFAA code of good practice that gives guidance of the steps to take in order to avoid contamination of water courses/attraction of vermin etc.

The guidance says:

- There should be a density of no more than 20 kg of carcass material per square metre.
- Bury animal carcasses with at least 1 metre of covering soil to prevent dogs, foxes or vermin getting access. SEPA would expect this to be done by the end of each day as a minimum.
- Keep a Location Plan of all burials and a note of type of animal buried.
- Choose sites where there is at least 1 metre of subsoil at the bottom of the burial pit.
- Don't leave carcasses unburied or open to dog or fox access for any length of time.
- Don't add lime to a lined disposal pit.
- Don't dump carcasses.
- Don't operate an animal carcass incinerator without prior consultation with SEPA.
- Don't bury carcasses any closer than 250m from any well, borehole or other drinking water supply; 50m from any river, burn, loch or other watercourse or 10m from any field drain.
- Don't locate burial pits in areas prone to waterlogging or at risk of flooding, or that are underlain by sandy or gravelly soil. The pit must be dry.
- Don't bury carcasses in polythene bags or other impervious material.
- Don't bury carcasses on archaeological sites or on sites designated for their nature conservation interest.

These points raise a number of questions/issues:

- If we can't leave pits exposed then how much man power would be required to re-open pits? Also an excavator would be required.
- Will a derogation be required from RPID?
- Since RSPB land is ruled out due to the last point on the list above, can we only use OIC land which could be a problem?
- We would likely require a large number of different pits – this could be an issue.

OIC Environmental Health would also need to be kept informed as they have an enforcement role.

2. Incineration

a) Do it ourselves

There are companies that you can buy or hire portable or containerised incinerators. However, we would need to find and hire an operator, find a suitable piece of land to house it and then work out what to do with the ash.

<https://www.inciner8.com/mobile-incinerators.php>

<https://www.inciner8.com/containerised-incinerators.php>

In Scotland, you must not operate an animal carcass incinerator without consulting SEPA.

If you burn non-agricultural animal carcasses or **parts of animal carcasses**, your incinerator must be authorised by the council or environmental regulator, in addition to Animal Health.

You must have a **pollution prevention and control (PPC) permit** from your environmental regulator if you operate an incinerator:

- with a capacity greater than 50kg per hour, and
- that is only used to incinerate whole animal carcasses.

b) Disposal through OIC Chinglebraes to Shetland Energy from Waste (EfW) Plant (existing route)

In discussions with Jonathan Walters (JW), OIC's Environmental Services Facilities Manager, it is clear that Orkney's small island facilities have not dealt with this type of waste in bulk before.

I asked whether it would be possible to purchase or rent a container that can be kept at an official waste disposal site such as Chinglebraes that can then be shipped off with other waste to Shetland for incineration.

JW spoke to Shetland Islands Council (SIC) and the amounts and costs are outlined below.

OIC/SIC think they could take up to 700kg monthly (approx. 3000 rats) but potentially less or more going forward as they are unsure how their system will cope at this stage with the extra weight and also because of the unknowns of dealing with this material within an EfW plant.

Currently, 200kg per month (approx. 870 rats) should not be an issue and they will monitor the process and inform us if any reduction is required and will feedback on potential issues.

OIC Chinglebraes, will take the waste, bagged – at a gate fee of **£248.33 +VAT per tonne**. This charge is for disposal and handling fees as it will be treated as clinical waste and will require separate shipment to SIC via clinical waste disposal routes.

If this is acceptable, the ONWP will need to register for an account at Chinglebraes WTS by emailing developmentandinfrastructure@orkney.gov.uk copying Jonathan Walters in so they can advise and prepare site procedures.

c) Use the SAC incinerator in Thurso

We would need a central storage area e.g. a barn on Orkney for the black disposal boxes and/or a freezer so smell is limited if only monthly deliveries.

Industrial chest freezer £500

SAC charge £114.50 +VAT per 50kg – and there is no limit to the amount that can be taken. (price changes annually) *we could have up to 46 x 50kg a month which is over £5000!

Northwards delivery charges = £40

3. Disposal at sea

This has been an option for some eradication projects with low numbers of carcasses. However, it does not seem appropriate for Orkney with potentially 10,000 carcasses a month, as there is a risk that the waste could be washed up on shore.


Alan Dundas from SEPA also says that he doesn't think this would be acceptable.

SUMMARY AND FINAL RECOMMENDATION

Logistically, burial will be complex, and disposal at sea is not acceptable. This leaves incineration.

Making use of existing waste disposal routes (i.e. via OIC) would be advantageous as it would be cheaper, and we could negotiate that the cost is absorbed if OIC become partner in the project. However, there are currently weight restrictions with this option, but this issue can be worked out over the course of the project as OIC have not dealt with such high quantities of this type of waste before so it needs to be trialled.

18 Annex VII: Conservation Indicator Dog Code of Practice (RSPB)

	<p style="text-align: center;">LAND MANAGEMENT CODE OF PRACTICE E14</p> <p style="text-align: center;">Using Conservation Indicator Dogs on and off reserves</p>
What is this about:	Using Conservation Indicator Dogs to search for and indicate the presence of species of pest management or conservation interest on and off RSPB nature reserves
Who should read this:	All RSPB staff and contractors involved in operations involving the use of conservation dogs
Contact Point:	Laura Bambini, Species and Land Management/Seabird Island Restoration Project
Contents:	<p>1.0 Introduction and scope</p> <p>2.0 Application and responsibilities</p> <p>3.0 RSPB policy</p> <p>4.0 Instances where conservation indicator dogs may be used</p>
Sensitivity	FOR INTERNAL RSPB USE ONLY
Summary	<p>To use conservation indicator dogs to search for and indicate presence of a species of interest, RSPB staff must ensure that:</p> <ul style="list-style-type: none"> • A proposal which clearly defines the objectives and end points of the search operation must be submitted for approval • The operation does not threaten the survival of, or cause undue disturbance to species of conservation concern or to sensitive habitat features • The legal requirements have been met and any licences that may be required are in place • Only appropriately trained and certified conservation dogs are used • All conservation dogs are operated by appropriately trained and qualified handlers • A report is produced at the completion of the operation, and reviewed by SIRP staff
Version	Version 1.0 May 2018

1 Introduction and scope

Conservation Indicator Dogs are an important tool used by island restoration projects worldwide. Trained and certified dogs, operated by experienced and qualified handlers, can reliably detect animal sign (e.g. scat) and scent (e.g. live animal or a den) and indicate to their handler the presence (and location, where appropriate) of a target species. Conservation Indicator Dogs can be used to search for and locate individual target species to assist biosecurity surveillance, predator incursion response and vertebrate control and eradication operations. Conservation Indicator Dogs can also be used to assist conservation translocations by searching for and locating species of conservation concern.

The purpose of this document is to outline the Code of Practice (CoP) for the use of Conservation Indicator Dogs by RSPB staff and contractors, on and off reserves, in the UK and Crown Dependencies, and the UK Overseas Territories. This CoP sets out the general principles and procedures that must be adhered to by all RSPB operations that use Conservation Indicator Dogs; legal requirements may differ between the UK countries, Crown Dependencies and between the UK Overseas Territories, and it is the responsibility of the in-country RSPB staff to ensure compliance with local policy and legislation.

This CoP is subject to regular review as necessary, and will next be reviewed by May 2019 the latest. Please ensure you are using the latest version.

2 Application and responsibilities

This CoP applies to all RSPB operations on and off reserves in the UK, Crown Dependencies and Overseas Territories, and it covers the use of Conservation Indicator Dogs to search for and indicate the presence and/or location of target species of conservation management interest. Before dogs can be used by the RSPB to support conservation management initiatives, the following conditions must be met:

A PROPOSAL MUST BE PREPARED FOR AND APPROVED BY SIRP (for offshore islands) and RSAG (for reserves in England, Wales and Northern Ireland) or SRMT (for reserves in Scotland)

The proposal must clearly define the scope, purpose, objectives and end points of the use of conservation indicator dogs, and must include a full risk assessment. The proposal must also outline plans for sourcing the dogs and handlers (e.g. competitive bidding or tendering process, use of in-house resources or volunteers) and, if dogs are sourced from overseas, adequate consideration must be given to the shipping requirements (animal welfare, import and export regulations, costs involved etc.). The proposal should include a communication plan, as the use of dogs is likely to attract local and/or media interest. The communication plan must outline any potential sensitivities and give adequate consideration to post-contract obligations of the contractor carrying out the work. The proposal must be submitted for approval by SIRP or RSAG who will assess it based on the conservation need and the appropriateness of the use of conservation indicator dogs for achieving the specified outcome(s). If the services of a conservation indicator dog and handler are acquired through competitive bidding or tendering, RSPB procurement policies and CoP 43 (Managing Contractors) must be adhered to, and it may be necessary to include a confidentiality clause in the contract (if reputational damage is identified as a risk).

THE OPERATION DOES NOT THREATEN THE SURVIVAL OF, OR CAUSE UNDUE DISTURBANCE TO SPECIES OF CONSERVATION CONCERN OR SENSITIVE HABITAT FEATURES.

Appropriately trained and certified Conservation Indicator Dogs may be used in protected areas and where sensitive habitat features or species of conservation concern are present. In the absence of a

UK standard, the Conservation Indicator Dog must meet the standards specified by the New Zealand Department of Conservation (NZ DOC) Conservation Dogs Programme, and described in their Standard Operating Procedure (<https://www.doc.govt.nz/Documents/science-and-technical/sops/dog-handlers/sop-conservation-doghandler-team.pdf>). The RSPB will work with canine professionals (e.g. the Police and Customs, and the NZ DOC) to develop UK best practice for the certification and use of Conservation Dogs. Conservation Indicator Dog operations can be carried out during bird breeding season, or during other sensitive times of the year, if an overriding conservation imperative or robust operational justification can be provided, and the conditions outlined herein are adhered to.

ONLY TRAINED AND CERTIFIED DOGS MAY BE USED.

Any dog used by the RSPB for the purposes of conservation management must be fully trained, obedient and with a proven ability (e.g. through a certification process) to detect and indicate target species. The dog must have the ability to reliably detect a specific target species, and must be trained to not indicate or react to any other species. The dog will have the ability to detect the scent of a trail, den, scat, carcass or live animal of a target species. The dog must not give chase to or attempt to capture any species, it must be muzzled and clearly identifiable (e.g. by a vest or a harness) when working, and it must remain under control at all times and may additionally be required to be on a lead (e.g. when operating in the vicinity of livestock). The dog must not be aggressive towards people or other animals, and it must not be of a prohibited breed.

DOGS MAY ONLY BE OPERATED BY TRAINED AND QUALIFIED HANDLERS.

Each Conservation Indicator Dog must have a designated handler who has the appropriate level of experience and skill required to safely operate the dog on-site, and who will normally have the duty of care towards the animal. The handler will be familiar with the dog and recognise when the dog is indicating the presence/location of target species, will reward the dog for doing so, and will have the experience and knowledge to be able to recognise when the dog may be incorrectly indicating a non-target species, and will have the ability to correct the dog's behaviour.

ANIMAL WELFARE STANDARDS MUST BE ADHERED TO.

Any Conservation Indicator Dog in use by the RSPB must be provided with appropriate shelter and food, must have access to drinking water, and must be treated humanely at all times. If the animal is shipped to/from overseas, adequate transport crate and/or kennelling must be provided and the welfare of the animal must be ensured whilst in transit. The animal must be vaccinated and must undergo regular veterinary checks, and must be fit, healthy and able to operate in the terrain and climate on-site.

LEGAL COMPLIANCE MUST BE ENSURED.

Different laws may apply to the use of Conservation Dogs in different UK countries and Territories. It is the responsibility of the RSPB to ensure that the Conservation Indicator Dog is not of a breed banned in the country of operation and, if applicable, is of a breed that is accepted for shipping by approved airlines. The RSPB will also ensure that the operation is legally compliant and that licences are obtained as necessary (e.g. a Schedule 1 Licence to Disturb breeding birds). If the dog is to operate within a protected area, it is the responsibility of the member of staff managing the works to establish whether this is a Potentially Damaging Operation, or an Operation Requiring Consent, and seek appropriate statutory approval and follow advice to ensure compliance.

LAND ACCESS PERMISSIONS MUST BE SECURED IN WRITING.

Written landowner consent needs to be acquired when Conservation Indicator Dogs are being operated on privately owned land, and on land under conservation management.

INSURANCE AND LIABILITY.

The Conservation Indicator Dog must be covered by insurance including, but not limited to, accidents and injury; damage to property; injury or death caused to people and domestic animals. The handler must equally have adequate personal insurance cover, which may include health and travel insurance if operating overseas.

AT THE COMPLETION OF THE OPERATION, A REPORT MUST BE PRODUCED.

The report should provide sufficient detail on the operation, including details of the findings, number of hours the dog worked, land area effectively covered by the searches, and any issues encountered. It is advisable that GIS data are recorded on any conservation indicator operations undertaken.

The senior member of staff on site is responsible for implementing this Code of Practice.

3 RSPB policy

The use of Conservation Indicator Dogs must be carried out in a responsible and legally compliant manner. The RSPB endorses the use of trained and appropriately certified Conservation Dogs to support conservation management initiatives, in particular the eradication or control of, and biosecurity surveillance for invasive non-native predators on offshore islands. Conservation Dogs may also be used to assist searches for rare and/or endangered species of conservation concern. The use of dogs is permitted under the RSPB's [Policy on the Killing or Taking of Vertebrates](#) (section 6.1.4) 'in tightly defined circumstances, to detect (e.g. point to) individuals of a target species'; the RSPB does not permit the use of dogs to flush out target species. These 'tightly defined circumstances' are defined in section 4 below.

4 Circumstances where the use of conservation indicator dogs is appropriate:

- Incursion responses; to assist in and guide incursion responses to predators on offshore islands where those predators are not native
- Early indicator and biosecurity surveillance; to assist in predator surveillance efforts on offshore islands known or believed to be otherwise free of specific predators
- Determining eradication success; post-eradication evaluation and surveillance for target species
- Supporting eradication operations and targeted vertebrate control in any other way as deemed appropriate and necessary by the operation, but not as an instrument of control
- Locating individual animals of a species of conservation concern for the purposes of translocation, or post-release monitoring of survival, or to assist in surveys for rare or difficult to detect species

Prepared by: Laura Bambini, Species and Land Management/SIRP

19 Annex VIII: Land access protocol



Orkney Native Wildlife Project – Land Access Protocol **DRAFT**

(To be Trialled during Development Phase)

Guidance for Farmers & Landowners (Version 5)

Introduction

The purpose of the Orkney Native Wildlife Project is to ensure the unique and iconic native wildlife of the Orkney Islands is safeguarded by directly addressing the urgent issue of invasive non-native stoats that are currently threatening the delicate ecological balance of the islands. The main element of the Project is to implement an eradication programme for the removal of stoats from Orkney by use of kill traps.

We wish to work together with farmers and landowners during this Project and the purpose of this protocol is to provide guidance for farmers and landowners on the process we will follow in order to agree access permission for staff, approved contractors and volunteers to undertake stoat trapping and monitoring for stoat presence on your land on behalf of the Orkney Native Wildlife Project. Additionally, it clarifies the measures that will be taken by all staff and volunteers when accessing land to undertake the siting, setting and checking of traps, and the protocols that apply to the use of certified conservation sniffer dogs operated by experienced handlers.

Staff, approved contractors and volunteers (hereinafter referred to as ONWP personnel) will be accessing your land on behalf of the Orkney Native Wildlife Project and therefore the Project Partnership (OIC, SNH and RSPB Scotland) will take full responsibility for staff and volunteers during the course of the Project. The farmer/landowner will not be liable for any claim for personal injury or damage to property resulting from staff, approved contractors or volunteers accessing your land to undertake the trapping work. The Project Partnership will accept responsibility for any damage to property resulting from the trapping and monitoring work of staff or volunteers. All staff, contractors and volunteers will adhere to approved Health & Safety Policy and appropriate risk assessments.

Procedure for Granting Access Permission

- ONWP personnel will meet with landowners and tenants to explain the purpose of the Project and how the stoat trapping, monitoring and dog searches will work on the ground.
- Landowners and tenants are requested to confirm to ONWP personnel the land they are able to grant access permission for and we will provide a map for this purpose.
- ONWP personnel will show you potential locations for traps and/or stoat monitoring equipment on a map and discuss with you any areas where you have specific access concerns, for example; fields with young calves, fields with recently sown crops, active electric fencing etc. and agree areas where traps will be permissible.
- ONWP personnel will discuss with you when and how they wish to carry out dog-assisted searches for stoats on your land, and as above, address any concerns you may have
- Landowners and tenants will be asked to confirm the most suitable routes across their land to provide access to the traps and/or stoat monitoring equipment, and/or to carry out dog-assisted searches, and these will be marked on the map for future reference.
- Project staff will keep you informed of progress during the work and how many stoats are caught. They will check with you regularly to see if there are changes that need to be made to access routes or if you have concerns about the trapping, stoat monitoring or the dog-assisted searches.
- You will be asked to confirm the access permission granted by signing the map with your land and agreed access routes identified. We will leave a copy of the map with you for reference along with contact details.

Operation – Siting, setting and checking of traps and monitoring equipment

- You will be informed in advance which ONWP personnel will be working on your land and they will carry identification badges/cards.
- All ONWP personnel will only be accessing your land to site, set and check the stoat traps and/or monitoring equipment.
- All ONWP personnel will follow strict protocol when accessing land, with the aim of minimising any disturbance to land management activities and will follow agreed access routes. Vehicles will be parked at agreed locations and they will leave a contact number visible in the vehicle.
- All ONWP personnel will clean and disinfect protective clothing and footwear between farms.
- Only Project staff and approved contractors will site and set the traps. Traps are to be situated roughly 250m apart in the best location on the ground for the interception of stoats. Traps and monitoring equipment are to be sited according to linear features in the landscape including fences, walls, ditches, tracks and road verges or where there is vegetative cover,. However, all devices will be positioned in such a way as to limit inconvenience to the landowner/tenant as far as possible.
- Traps and monitoring equipment will be covered if appropriate and will be sited discreetly so as not to be obvious to members of the public.
- Traps will be checked every three weeks on average.



Only traps approved under the Spring Traps Approval Order will be used, for example the DOC200 trap below. All traps will be enclosed in a box or tunnel which have safety labels and contact details displayed.

- All traps have restricted entrances allows stoats to enter but prevents larger non-target species from entering and the offset entrance prevents cats or dogs getting paws caught.
- Voles will be able to enter the traps but they will be too light to set off the spring trap; however, rats are likely to be a by-catch. The Project will address any issues arising from trapping of non- target species.
- Traps will be baited with items such as egg and rabbit.
- All stoats caught will be removed and disposed of by Project staff.

Operation – dog-assisted searches

- All Dog handlers will adhere to the same land access protocols as outlined above for trappers and/or volunteers
- Only accredited conservation sniffer dog handlers will operate on behalf of the ONWP, and will only use trained and certified conservation sniffer dogs
- All approved Conservation sniffer dogs will be clearly identifiable by a vest or a harness
- All dogs shall remain under close control and supervision of the handler at all times
- All dogs shall wear a muzzle when working, and shall remain restrained by a leash unless permitted to work off-leash by the landowner
- All dogs will only be used to search for and indicate the location of stoat sign (e.g. scat, prey remains or a den) or the scent of a live stoat
- All dogs shall under no circumstances attempt to give chase to or capture any live animal, including pets, vermin, livestock and all species of wildlife



All conservation detection dogs will wear a muzzle when working, and will be clearly identifiable by a vest or a harness.

20 Annex IX: Equipment and logistics budget

Item	Unit cost incl. VAT	Number of units	Total budget exc. VAT
Citroen Dispatch Crew Van	£22,110.00	2	£57,228.34
Citroen Dispatch Enterprise	£18,840.00	2	£50,688.34
Mitsubishi L200 Series 5 single Cab 4Life 4x4 or similar	£21,598.80	2	£56,205.94
Underbody protection for vans	£80	6	£400.00
Grip Control for vans	£660	6	£3,300.00
Kawasaki Mule SX 4x4	£8,134.80	2	£21,058.00
Trailer to carry ATV	£10,000.00	2	£16,666.67
Trailer to attach to ATV	£2,500.00	2	£4,166.67
Fuel for 6 vehicles	£250/month/vehicle	300	£75,000.00
Fuel for ATVs	£150/month	50	£7,500.00
Vehicle insurance	£560/year	30	£16,800.00
Logos	£250/vehicle	6	£1,250.00
DOC150/200 traps	£36	16,000	£480,000.00
Trap boxes - extended	£40	7,000	£233,333.33
Goodnature A24 trap	£70	1,000	£58,333.33
Gas cylinders (A24)	£3	7,500	£22,500.00
Delivery - all traps	£10,000	N/A	£8,333.33
Bait for DOC traps	£500/month	60	£30,000.00
Lure for DOC traps	£30	100	£2,500.00
Lure for A24 + shipping	£30	60	£1,500.00
Batteries for GPS etc	£5	15	£3,750.00
PPE	£1,000	15	£62,500.00
Spot trackers	£200	15	£2,500.00
Spot annual subscriptions	£120	15	£7,500.00

Spot annual costs	£100	15	£6,250.00
GPS's + mapping	£160	15	£2,000.00
Laptops	£500	8	£3,333.33
Mobile phones with contract	£240	15	£15,000.00
Air weapon plus licences	£200	15	£2,500.00
Trail Cameras	£250	50	£10,416.67
Batteries for trail cams	£5	1500	£6,250.00
Battery charger	£600	1	£500.00
SD Cards	£20	100	£1,666.67
Carry packs	£100	10	£833.33
Flagging tape	£50	N/A	£41.67
Notebooks, bins, postage	£8,158	N/A	£6,798.33
Trap maintenance kits: wire, drills etc.	£5,000	N/A	£4,166.67
Conservation dogs (incl. all costs, training, food, vet bills, insurance etc.)	£15,000	6	£90,000.00
Kennelling for dogs	£50,000	N/A	£50,000.00
Office furniture	£20,000	N/A	£20,000.00
Total			£1,463,728.94