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Standard Operating Procedures for Control of American Mink (Neovison vison)

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1. Introduction

American mink (*Neovision vison*) are an invasive non-native species (INNS) that were introduced to Northern Ireland for commercial fur farming in the 1950s, the first documented escape occurred in 1961 when 30 mink escaped from a fur farm near Omagh (Deane & O'Gorman, 1969). By 2003, when fur farming was banned, mink had become wildly established throughout Northern Ireland.

1.1 - Description

Mink are a semi aquatic, medium sized mustelid (family of mammalian carnivores including badgers, otters, pine marten, stoat and the INNS feral ferret), generally dark brown appearing almost black, much smaller than an otter but larger than a stoat or pine marten (Dunstone & Macdonald, 2008). They have a distinctive white patch on their chin which rarely extends to their top lip or above.

Body length of individuals typically ranges from 32-47cm, with their tail accounting for a further 13-23cm equating to roughly half the body length. Females (0.7kg) are smaller than males (1.2kg).

<u>1.2 - Habitat</u>

N. vison are adaptable to a variety of habitats but are principally found along the banks of rivers and lakes and also along the coast. Dens are usually close to the water's edge, often in amongst roots of riverside tree or boulders. Mink are excellent swimmers and divers, and can stay under water for some time.

1.3 - Impact

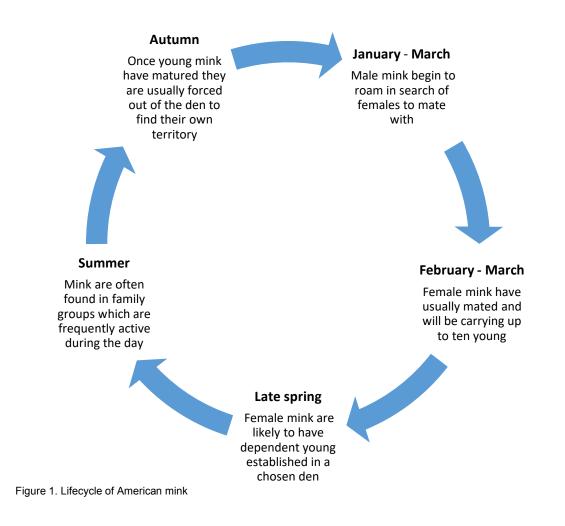
Mink are opportunistic carnivores and in Northern Ireland they have a significant impact on native wildlife. They predate on sea birds, domestic fowl (ducks, cygnets, moorhen etc.), fish, rabbits and small mammals which they often store following a kill (Booy *et. al.* 2015).

1.4 - Behaviour and lifecycle

Mink are most active at dusk and dawn (crepuscular) and night (nocturnal) but can be seen during the day, albeit in much less numbers.

They are strictly territorial, males occupy exclusive home ranges of 1-6 km in length. Female mink have smaller territories (approximately 3km of waterways) within or overlapped by those of males.

Female mink have a single litter each year, typically between April and early May, of between 3 - 6 kits. While nursing the young the mother will hunt intensively within her home range.



1.5 - Field signs of mink

Mink use their scats to mark the boundaries of their territory and the surrounding area of their den. Along with footprints, scats are a good indicator that mink are present in an area. Scats are usually found in prominent locations, such as rocks or logs. Appendix 1 includes some examples of tracks commonly found along water bodies in Northern Ireland.

A mink raft (section 4.5) can also be used to determine the presence of mink. Animals that pass through the tunnel, walk over a clay pad and leave behind a record of their tracks. This method has the added benefit that once a mink has been detected a cage trap can be placed on the raft in the same location.

Although generally more effective for monitoring larger mammals, camera traps can also be used to monitor for the presence of mink, e.g. they can be used to confirm suspected mink tracks or dens. To improve the likelihood of photographing mink, camera traps can be deployed in conjunction with bait stations or scent lures to make sites more attractive.

2. Relevant legalisation

Before conducting any mink control, all persons must be aware of and adhere to appropriate legislation, as well as being fully competent and obtaining any relevant qualifications, training or licences required for the use of specific equipment or practises. Relevant legalisation includes;

- The Wildlife (Northern Ireland) Order 1985 as amended.
- The Destructive Imported Animals Act (Northern Ireland) 1933.
- The Mink (Importation and Keeping) Regulations (Northern Ireland) 1976.
- The Wildlife and Natural Environment (NI) Act 2011.
- The Welfare of Animals Act (Northern Ireland) 2011.
- The Spring Traps Approval Order (Northern Ireland) 2019.
- <u>The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 and its</u> <u>subsequent amendments.</u>
- The Firearms (Northern Ireland) Order 2004 as amended.
- <u>The Invasive Alien Species (Enforcement and Permitting) Order (Northern Ireland)</u> 2019.

3. Types of mink control

3.1 - Biological control

Recent recovery of native otter (*Lutra lutra*) populations has been concurrent with the decline of mink (Mcdonald *et. al.*, 2007), demonstrating that otters can have a dramatic impact on mink population and distribution (Bonesi and Macdonald, 2004) (Bonesi, *et. al.*, 2006). Although a healthy otter population may assist in mink control, supplementary trapping may be considered in areas of high mink populations where they are having a negative impact upon biodiversity.

3.2 - Fencing

The use of mink-proof fencing can exclude mink from an area of conservation or where animals are vulnerable to predation (e.g. a fishery, or a chicken, pheasant or other fowl pens or runs). The proofing of pens and runs needs to be undertaken carefully as mink are good climbers and can squeeze through small gaps. The specifics of an effective mink fence vary, but in general they must be buried (photo 2) and fitted with a roof, or an overhang or baffle of material that mink cannot climb. Fences should be maintained and kept clear of vegetation.

There are some instances of regulation of mink fencing. In Newfoundland and Labrador (Canada) a mink proof fence is required to be 1.8m high, buried to a depth of 30 cm and topped with 30cm wide folded sheet metal roof (further specifics are detailed in the Newfoundland and Labrador Regulation 38/12 - <u>https://www.canlii.org/en/nl/laws/regu/nlr-38-12/latest/nlr-38-12.html</u>)

Similarly in Denmark, a mink fence is required to be 150cm high and buried to a depth of 50cm, with the top 50cm of the fence covered with a material that mink cannot climb (see appendix 2 for further details).



Image 2. Installation of predator fencing © Chris Ramsey https://sheskinmore.files.wordpress.com/2014/09/217.jpg

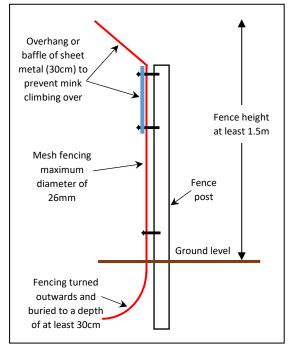


Figure 2. Side profile of a mink fence

3.3 - Trapping

Trapping is the legally acceptable and most effective way of controlling mink. There are 2 types of trap allowed by law, cage traps (live capture traps) and spring traps (killing traps).

When planning any control of mink, permission of the landowner (preferably written) must be in place before any control is undertaken. Where the landowner does not control the sporting rights, it will also be necessary to seek the permission of the owner of the sporting rights.

3.3.1 - Spring traps

Spring traps must be approved for use on American mink and used in accordance with manufactures instructions. The type and make of spring trap must be included in Schedule 1 of <u>The Spring Traps Approval Order (Northern Ireland) 2019</u> with the listed associated conditions adhered to.

Spring traps are non-target specific and must be used in a manner that minimises the likelihood of killing, taking, or injuring non-target species. As mink and otters can commonly occupy the same areas, this generally limits the use of spring traps.

As a result cage traps (live capture traps) followed by dispatch is the most appropriate method as it allows for release of non-target species.

3.3.2 - Cage traps

Depending on the target species cage traps are available in various sizes, so ensure that traps are designed to capture mink. They are readily available from hardware stores and specialist retailers online. Approximate dimensions of commonly used traps for mink - 60cm x 18cm x 16cm ($L \times W \times H$).

When selecting a cage trap ensure it has a handle. A handle provides a safe method to moving the cage (especially when there is a trapped animal inside), it will also avoid any unnecessary restraint of the animal. If necessary a handle should be added to a cage trap.

Cage traps consist of wire mesh box with one or two open ends. Once an animal enters the cage and steps on the internal foot plate the doors are triggered closed.



Image 3. Live cage trap. © NIEA



Image 4. Otter guard placed on the opening of a cage trap. $\ensuremath{\textcircled{}}$ Nigel Burch

When targeting mink, in order to reduce the likelihood of capturing adult otters (not effective for younger otters), the trap opening should be small enough to exclude them or be restricted by adding an otter guard. A purpose made otter guard is a section of wire mesh placed over the entrance to reduce the size of the opening (image 4). Similarly, the opening of the trap can also be reduced by using strong wire or wooden battens.

3.3.3 - Location

Mink are curious creatures and will often investigate tunnels, unusual holes, burrows and man-made objects. Set traps where mink are most likely to encounter them, for example;

- Confluences of watercourses, inlets or outlets for ponds and lakes, where drains, hedges or fence lines meet watercourses.
- On or near notable bankside features such as weirs, fallen logs or bridges.
- In or near culverts.
- On islands and purpose-made mink rafts (section 3.5).

Ideally traps should be positioned at 1km intervals on a watercourse. A high density of traps is required for an effective coverage on a water course.

It is advisable not to position rafts or traps in the open, particularly beside public footpaths. This is to avoid theft, vandalism and distress to trapped animals. If it is not possible to place a trap out of sight, signage should be clearly displayed to inform passers-by that it is a legal trap and should not be tampered with (see appendix 3). To further help prevent trap interference it is also advisable to provide contact details to land owners or regular land or water users.

While planning any trapping, landowner permission must be obtained.

3.3.4 - Animal welfare

To maintain a high standard of animal welfare and to ensure potential stress suffered by the animal is minimised, it is essential to consider the following;

- Ensure a trap is above potential rises in water level (debris lines often indicate flood levels).
- Make sure the trap is set on even ground so that movement of a trapped animal cannot knock the trap into water or onto its side. Pegging down traps with simple metal tent pegs is recommended.
- Traps can be partially dug into the ground if you require extra stability. An unstable trap will deter mink from entering.
- Cover traps in dry grass/hay any creature caught can pull this through the mesh to make a bed.
- In order to deflect rain and provide shelter, traps can be set between logs, covered with sticks, driftwood, stones etc. Similarly traps can be modified with polythene, plywood or Perspex (ensure any material used for shelter does not interfere with the operation of the trap).
- Do not put live cage traps out if there is a risk of high flows or extreme weather.
- Traps must be checked regularly, see section 5.



Image 5 - Live cage trap dug into the ground offering stability and shelter. © Dave Fergusson, CC BY-SA 2.0, https://commons.wikimedia.org/w/index.php?curid=14132114



Image 6 - Live cage trap with wood attached to provide shelter. © Des Colhoun, CC BY-SA 2.0, https://commons.wikimedia.org/w/index.php?curid=12541903

3.4.5 - Setting the trap

When setting the trap, creating a dark and interesting hole will encourage mink to investigate. The provision of bait (e.g. fish-flavoured cat food, fish) can increase the attraction for mink, while the use of scent gland lure or extract has also shown to improve the efficiency of cage traps (Roy *et. al.* 2006). However as mink are intensely curious, baiting of a well located trap is often not necessary.

3.5 - Mink Raft

Rafts are floating platforms anchored to the bank with a tunnel in the centre (image 7 & 8). Inside the tunnel, depending on function (e.g. monitoring or trapping) there is a clay pad or a cage trap. There are a number of mink rafts designs that are available to purchase online from various suppliers.

In recent years, the standardised design pioneered by the Game & Wildlife Conservation Trust (GWCT) has offered a proven technique for catching mink (Martin and Lea, 2020). The GWCT mink raft can detect significantly more mink compared to field observations and trapping (Reynolds *et. al.* 2004), while also reducing non-target impacts, trap use and therefore operator costs (Porteus *et. al.*, 2011). Rafts are a common option in control projects throughout Europe (Bryce *et. al.*, 2011, Diana Clamote Rodrigues *et. al.*, 2014, Harrington *et. al.*, 2009, Horrill *et. al.* 2019, Stien and Ims, 2015), generally being adopted by smaller seasonal projects, as it allows volunteers or a smaller number of staff to carry out mink control (Roy *et. al.*, 2009).

Instructions on how to build a GWCT mink raft are also available online;

- Game and Wildlife Conservation Trust (GWCT)
- Norfolk Mink Project

Although rafts have a number of benefits compared to standard cage trapping, they are more expensive, require significantly more effort to deploy and are more susceptible to flood damage. It should also be noted that rafts are not suitable to every river (e.g. spate or depth-variable rivers) and they are difficult to deploy in tidal systems (Roy *et. al.*, 2009).

3.5.1 - Location

Ideally place rafts at river intersections and at 1 km apart. To make the raft less conspicuous, vegetation can be added or it can be placed at the water's edge. Mooring rafts in areas where access is limited to wading can reduce the risk of interference from passersby. To further reduce risk of trap interference signage should be clearly displayed. It is also advisable to inform and explain to relevant government department (e.g. NIEA wildlife team and DAERA fisheries or Loughs Agency) local groups or organisations (angling, kayaking clubs etc.) that rafts have been deployed for the purpose of monitoring and trapping mink.

Do not put rafts out if there is a risk of high flows or extreme weather.



Image 7 - Mink raft with an explanatory notice attached. © ronnie leask, CC BY-SA 2.0, https://commons.wikimedia.org/w/index.php?curid=13682459



Image 8 - Mink raft in monitoring function, with clay pad located within tunnel. © jeff collins, CC BY-SA 2.0, https://commons.wikimedia.org/w/index.php?curid=13714715

3.5.2 - Monitoring

Once the raft has been positioned and secured, it should be left for 1-2 weeks to monitor the area. Being inquisitive, mink will pass through the tunnel and leave there tracks on a clay pad therefore confirming their presence in the area.

It is important to keep the clay pad in good working condition, at every check remove debris and smooth over the surface. Every 2-4 checks it may be necessary to replace the clay pad (strong winds or sub-zero temperature can dry out the clay pad, while repeatedly smoothing over can cause the loss of clay particles).

The clay pad will record any animal that passes through the tunnel, therefore it is vital to correctly identify mink tracks before commencing any live cage trapping. There are examples of commonly encountered field signs, prints and clay pad impressions in appendix 1 which will help establish which species are using the raft. If you are uncertain take a good photo of the impression or faeces with something to help scale the image (a coin for example) and send to your co-ordinator or local expert.

3.5.3 - Trapping

Once the tracks of a mink have been identified, remove the clay pad from the raft and slide in the live cage trap. Place the opening of the cage trap on the downstream side, as this is the most likely side a mink will climb onto the raft. Ensure the tunnel fits properly so that the animal is sheltered and the trap mechanism works correctly. Once the trap is set, usually mink will be caught within a few days.

After running the trap for a maximum of seven to ten days, the raft is returned to monitoring function, to establish whether there is still mink to be caught. In this way, the mink control effort becomes self-assessing and it is easy to see whether trapping is effectively controlling mink numbers.

Further details on the deployment, maintenance, clay preparation and raft trap FAQs can be found in <u>The Game and Wildlife Conservation Trust Mink Raft</u> guidelines document.

4. When to trap

Trap between January and mid-April to minimise the potential breeding population of mink and from August to December to catch dispersing and wintering animals. Do not set traps in extreme weather - torrential rain or storms - as this can cause undue distress or death of captured animals (which may not always be mink). Mink will continually re-colonise unoccupied areas if they are not being controlled on adjacent land, therefore once monitoring and the necessary trapping have started it should be kept up. Short periods of trapping (5 to 10 days at a time) can be as effective as continual trapping.

5. Checking the trap

To maintain high animal welfare standards and avoid any breeches of the <u>Welfare of</u> <u>Animals (NI) Act 2011</u> traps must be checked at least once every 24 hours, ideally twice daily. If the trap cannot be checked at least once every 24 hours it should be removed or pegged open. The best time to check a trap is in the morning as many riverside animals are most active during the night. Removing animals in the morning reduces the chance of their discovery by the public and their exposure to the light and heat during the day.

Mink are included on '<u>Schedule 9</u>' of the Wildlife (Northern Ireland) Order 1985 as amended' and as a result if a trap contains a mink, it must be dispatched, as it would be an offence to release or allow it to escape into the wild. Similarly if a grey squirrel has been trapped, under <u>The Invasive Alien Species (Enforcement and Permitting) Order (Northern Ireland) 2019</u> it would be an offence to release it back into the environment and therefore must be dispatched.

Any non-target species (e.g. otter) that is not an invasive non-native species (included on '<u>Schedule 9</u>' and on the '<u>List of Invasive Alien Species of Union concern</u>') must be released immediately.

5.1 - Smart traps

This is a system which alerts a nominated person by either text or email that a trap door has been triggered closed. It is not limited to any model or make of trap. Trap closure alarms rely on a mobile phone signal and therefore their use may be limited in some remote areas. When in an appropriate area, alarms are highly reliable and send out an 'all okay' message every 12 hours. Providing the signalling mechanism works, the trap is visited only when there is a captured animal. This can improve welfare, as the animal is usually in the trap for a shorter period of time.

Using an alarm system enables staff to make fewer trap inspections and cover more traps, therefore improving efficiency and reducing the number of staff required. This can also maintain motivation, as there are fewer 'wasted' inspections of empty traps, which is common (due to the diminishing densities of a successful trapping project) in a standard trapping programme.

It is the user's responsibility to ensure that the alarms are functioning correctly. Before relying upon a trap alarm system, site specific trials must be undertaken. The alert system must run alongside traditional trap inspections until users are satisfied that the system is working correctly. Due to the reliance on a mobile phone signal, when a trap is moved to a new area, the alert system must be validated again. Failure to ensure the trap alarm system is functioning correctly may be in breach of <u>The Welfare of Animals Act (Northern Ireland)</u> 2011.

Trap alarm systems are continually developing area of technology which is still to be trialled by DAERA, <u>Mink police</u> and <u>Remoti</u> are two commonly used systems. Additional costs (unit and on-going subscription) of the alarm systems can be out-weighted by the reduction in staffing. During three years of deployment in Cambridgeshire, during which time 18 mink were caught, trap alarms (trade names *Remoti* - www.remotisystems.com and *Mink Police* - www.minkpolice.com) reduced the number of raft visits per capture by 99% (Martin & Lea, 2020).

6. Dispatching mink

6.1 - Direct shooting in open ground

Licensed firearms owners can dispatch mink in open ground in accordance with the Firearms (Northern Ireland) Order 2004 as amended.

6.2 - Trapped dispatch

There are 2 recommended methods that are available to use to dispatch cage trapped mink in Northern Ireland, either by airgun or by an approved spring trap attached to the cage trap (section 6.1 and 6.2 respectively).

It is strongly advised that any person who intends to dispatch cage trapped mink (either by airgun or spring trap) undertakes appropriate training prior to commencing any control measures. Although none of these courses have been officially approved by NIEA, some current providers of relevant training include;

- The British Association for Shooting and Conservation (BASC) <u>www.basc.org.uk</u>, email <u>nire@basc.org.uk</u> 02892 605050.
- The <u>Game and Wildlife Conservation Trust</u> offer training in GB, focusing on the use of their mink raft design. Bear in mind that content of this course will not be Northern Ireland specific - <u>advisory@gwct.org.uk</u> - 01425 651013.

A secondary method of dispatch must be readily available in case of any failure of equipment or the first method of dispatch is unsuccessful.

6.2.1 - Airgun dispatch for trapped mink

<u>The Firearms (Northern Ireland) Order 2004 as amended</u> states that a firearm certificate is required for the purchase and possession of firearms, this includes an airgun with a discharging kinetic energy in excess of 1 Joule (0.737 ft lbs). To humanely dispatch a large mink requires an airgun with an energy of 4.2 Joules (3.1 ft lbs) or more (GWCT 2015). As a result, in Northern Ireland to dispatch a mink following the airgun methodology the operator is required to hold a firearms certificate.

This method of dispatch should only be carried out by experienced, licensed firearms users with full insurance and the permission of the landowner. It should be noted that if permission has not been obtained prior to entering land with a firearm, the user commits the offence of armed trespass. This is a serious criminal offence which carries a maximum penalty of a $\pounds 5,000$ fine and one year imprisonment. It is strongly recommended that this permission is obtained in writing.

Extreme care must be taken by anyone using this methodology. Pellets may deflect off the cage wire or stones on the ground. All additional observers should do so at a safe distance and have appropriate eye protection.

Place the cage trap on soft ground clear of stones before shooting. If the trap has to be moved use the handle, if there is no handle use combs (also known as trap dividers) to ensure that the mink is restrained before handling the cage.

The mink may squeal when exposed from under the tunnel or restrained. In order to limit the period of time the mink is stressed, prepare the airgun, pellets and comb(s) before removing the tunnel from the raft. However, do not load the gun until the animal has been restrained; release the safety catch only when you are ready to fire the shot.

The mink must be kept still in the trap to allow for an accurate humane dispatch shot. This can be done by using two combs to push



Image 9 - Trapping combs © Open Government Licence v3.0. UK Forestry Standard Technical Note - Controlling grey squirrels in forests and woodlands in the UK. <u>https://www.forestresearch.gov.uk/documents/7482/UKFSTN022_M7ID</u> <u>PeR.pdf</u>

the mink firmly against the side or roof of the cage, restraining it in the manner of a livestock handling crush.

Once restrained, hold the gun's muzzle a few centimetres away from and perpendicular to the skull (avoid the centreline of the skull as it is very strong) and shoot the mink. A single shot should be enough to kill the mink, however a second shot aiming at the junction of the skull and neck to destroy the brain stem is recommended. Take the second shot as quickly and safely as possible.

Be prepared for convulsions and kicks as the animal dies. Death can be confirmed by;

- Animal collapsing.
- Fixed glazed expression.
- No corneal reflex.
- No regular breathing.

Once death is confirmed the airgun should be unloaded and made safe.

It is the responsibility of all shooters to ensure the safety of themselves, colleagues, members of the public and non-target species. Failure to do so may lead to criminal prosecution and or civil litigation.

6.2.2 - Spring trap dispatch for trapped mink

If the use of an airgun on site is not feasible, an approved spring trap may be used to dispatch mink.

The methodology developed by the Northern Ireland Squirrel Forum (NISF) '<u>Control of grey</u> squirrels for red squirrel conservation ~ a code of good practice' details how the use of an approved spring trap can be used in conjunction with a cage trap to efficiency and humanely dispatch squirrels. This same methodology can be used to also dispatch mink.

With a few minor alterations to the housing of a 'Kania Trap 2000' (approved for mink) allows it to be fitted tightly to the entrance of the cage trap. Before arming and attaching the spring trap, the cage must be on stable ground. If using a raft, the cage trap must be removed and placed on stable ground. When moving the cage trap use the handle, if there is no handle use combs ensure that the mink is restrained before handling the cage.



Image 10 - live cage trap with Kania 2000 spring trap attached. © Joe Dowdall

With the cage trap stable and the mink restrained, arm the spring trap and using springs or bungie cords attach it securely to the cage trap. The cage door can then be locked open using a wooden dowel, and the comb released. The mink should likely run toward the spring trap and be dispatched cleanly. The spring trap housing can be modified to have a Perspex window which encourages the mink to run toward the light, but this is not entirely necessary.

When using this dispatch methodology ensure the connection between the selected approved spring trap and the cage trap has been tested before using in the field. In many cases the approved spring trap will have to be modified to allow a secure connection to the entrance of the cage trap. Any modifications must not interfere with the trap spring mechanism.

Schedule 1 of The Spring Traps Approval

Order (Northern Ireland) 2019 provides a list of all approved spring traps, these should also be used in accordance with the listed conditions and manufactures guidelines. Once the mink has been dispatched the carcass must be disposed of responsibly by incineration or burial.



Image 11 - modified Kania 2000 spring trap with Perspex window. Joe Dowdall

6.3 - Dispatch by arrangement

Another option is to use a local vet or private companies to dispatch the mink by arrangement but as they would likely charge for the service, over time it may be cheaper to dispatch on site.

7. Health and safety

As controlling mink involves trapping wild animals near or in water, there are significant associated risks.

When trapping:

- Always wear thick gloves when carrying, handling and setting traps.
- Carry a first aid kit and know how to use it.
- Do not attempt to handle a live mink, they can be dangerous animals when they feel threatened.
- Prior to conducting any trapping of mink, ensure that tetanus vaccinations are to up-to-date.
- To avoid bites, when a mink is trapped ensure to keep hands away from the cage. If the cage must be moved use the handle.
- Before opening the cage trap door (to release a non-target animal or to dispatch a mink with an attached spring trap) use combs to ensure that the animal is restrained to the back of the cage.
- If bitten, wash with antiseptic and seek medical advice.
- Animals will almost certainly urinate and defaecate when trapped inside a cage trap and it is likely when trapping you will encounter rats and other rodents. As a result there is a risk of catching Weil's disease (leptospirosis), gloves should be worn when handling dead mink or trapping equipment.
- Cage, spring trap and all other equipment must be disinfected once a mink has been dispatched and removed. Eye protection and chemical proof nitrile gloves should be worn when using disinfectants. When selecting a disinfectant consider its potential effect on any equipment and its environmental impact, see list of <u>DAERA approved</u> <u>disinfectants</u>.

When working near water:

- Wear appropriate footwear and be aware of uneven, unstable or slippery ground.
- To avoid low light levels and to limit stress to animals, traps should be inspected in the morning. If inspecting a trap in darkness is unavoidable ensure a torch is available for use.
- Consider wearing a personal flotation device or a life jacket, a throw rope, if working in or next to deep water. Training courses are available for safely working near water.
- Check weather forecast in advance and be aware of potential flood events.
- Operate a buddy/lone working system when inspecting traps alone. Make sure someone knows where you are going and when you expect to return.

7.1 - COVID-19

Human-to-mink, mink-to-human and subsequent human-to-human transmission of mink variants of SARS-CoV-2 have been recorded in Denmark (WHO 2020, Oude Munnink *et. al.*, 2020), with a number of countries reporting COVID-19 in farmed mink. However COVID-19 has been detected in wild mink (De Liberto & Shriner, 2020).

Public Health England - Human Animal Infections and Risk Surveillance (HAIRS) group conducted a '<u>Qualitative assessment of the risk that SARS-CoV-2 infection in UK Mustelinae</u> <u>presents to the UK human population</u>' in November 2020. Although controlling wild mink for conservation reasons was not directly addressed in this risk assessment, the caring of mink

in wildlife rescues centres was considered. Given the similarities of working within close proximity and the handling (after dispatch) of mink, the limited risk of exposure in relation to wild mink in rescues centres could also apply to conservation control measures;

'given the risk of SARS-CoV-2 infection in Mustelinae species is believed to be very low, there will be only a limited risk of exposure'. HAIRS 2020

Albeit unlikely, the spread of mink-related variants of COVID from mink farms to the wild population within Northern Ireland should be considered (there are no mink farms in Northern Ireland, there are 3 in Ireland). Precautions should be taken to limit potential exposure to mink-related variants of COVID.

The greatest risk of exposure to mink-related variants of COVID during their management, is the potential dispersal of aerosols during the dispatching procedure and when handling carcasses (e.g. compression of lungs when placing the animal on the ground).

A filtering face piece (class 3) (FFP3) respirator must be worn to limit exposure to aerosols. All tight fitting Respiratory Protective Equipment (RPE) (i.e. FFP3 respirators) must be:

- Single use (disposable) and fluid-resistant.
- Fit tested to ensure an adequate seal / fit according to the manufacturers' guidance.
- Fit checked (according to the manufacturers' guidance) every time an FFP3 respirator is donned to ensure an adequate seal has been achieved.
- Compatible with other facial protection used i.e. protective eyewear.

Guidance on using and checking a respirator is provided by the <u>HSE</u>.

For further information in relation to COVID-19 and working with wild animals see the guidelines produced by the World Organisation for Animal Health - <u>Guidelines for Working</u> with Free-Ranging Wild Mammals in the Era of the COVID-19 Pandemic.

8. Biosecurity

When redeploying or moving any raft or trapping equipment from one water body to another, care must be taken not to spread any invasive non-native freshwater species. Following the steps of the '<u>Check, Clean, Dry</u>' campaign is the simplest and most effective way to stop the spread of invasive non-native species.



- Check your equipment and clothing for living organisms
- Pay particular attention to areas that are damp or hard to inspect
- Clean and wash all equipment, footwear and clothes thoroughly
- If you do come across any organisms, leave them at the water body where you found them
- Dry all e
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 - Dry all equipment and clothing some species can live for many days in moist conditions
 - Make sure you don't transfer water elsewhere

9. Record keeping

Keeping accurate records of time, location and in which trap a mink was captured is important, it can determine the effectiveness of the trapping. If the trapping is part of any wider project, sharing information will enable the analysis of your results and observations, identifying any trends or patterns and provide feedback to you and others taking part. Records from live cage trapping and clay pad track recording of non-target species can also be of great benefit to other projects.

Appendix 4 has an example of a recording template which can be used to capture key information every time a trap or raft is visited.

As well keeping records for your own or your projects use, submitting records online to <u>CEDaR</u> would be strongly encouraged.

10. Disclaimer

Please note that the products and manufacturers mentioned in this publication is not comprehensive and other manufacturers may be able to provide products with equivalent characteristics. Reference to a particular manufacturer or product does not imply endorsement or recommendation of that manufacturer or product by DAERA. NIEA, an agency of DAERA accept no liability for any loss or damage arising from the interpretation or use of this information.

11. References

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Appendix 1 - Field signs

1. Mink (Neovison vison)



Image 12 - American mink and den. © Christian Fischer, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=51334592

Mink scats

- 5-8 cm long.
- 1 cm diameter.
- Cylindrical with twisted ends.
- Solid to very loose and liquid.
- Varying in colour from dark green to brown.
- Unpleasant in odour.
- Often contains fur.
- Usually found at dens or on prominent objects, such as logs or rocks.



Image 13 - Mink scat. © Rose Cremin

Mink tracks

- 2-4 cm wide, about as long as wide.
- Often in a splayed star shape.
- Claw marks in front of toe pads (resulting in a teardrop shape).
- Usually only 4 of 5 toes visible in print, sometimes fewer.
- Heel pad usually fairly small.



Image 14 - Mink paw mark. © Paul Gambling



Image 15 - Mink paws. © Paul Gambling



Image 16 - Mink print on soft ground. © The Mammal Society



Image 17 - Mink print. © The Mammal Society

Mink tracks in clay pad



Image 18 - Mink tracks on clay pad. © Paul Gambling



Image 19 - Faint mink tracks on clay pad, note the lack of claw markings. © Paul Gambling

2. Otter (Lutra lutra)



Image 20 - Otter (Lutra lutra) © Laurie Campbell

Otter scats (spraints)

Compared to mink scats otter spraints are;

- Larger (10cm long).
- Cylindrical without twisted ends.
- Sweeter in odour.
- Often contain fish bones and scales.
- Found in similar locations to mink scats, i.e. prominent places.



Image 21 - Otter spraint. © Laurie Campbell



Image 22 - Otter spraint. © David Perez, CC BY 3.0, https://commons.wikimedia.org/w/index.php?curid=121388 55



Image 23- Otter spraint. © Huges4981, CC BY-SA 4.0, <u>https://commons.wikimedia.org/w/index.php?curid</u> =90826835

Otter tracks

- 5-7 cm wide (twice as large as mink).
- As long as wide, hind print longer.
- Usually 4 of 5 toes show, 5th toe is raised.
- Toe pads in asymmetrical arc in front of heel pad.
- Claw marks close in front of oval toe pads (resulting in a teardrop shape).
- Have pronounced webbing between toes.

Front/fore paws



Image 24 - Underside of otter fore/front paw. $\ensuremath{\textcircled{}}$ Paul Gambling

Rear/hind paws (small dog otter)



Image 25 - Topside of otter fore/front paw. © Paul Gambling



Image 26 - Rear/hind paw marks of otter in clay pad. $\ensuremath{\mathbb{C}}$ Paul Gambling



Image 27 - Rear/hind paw of otter. © Paul Gambling

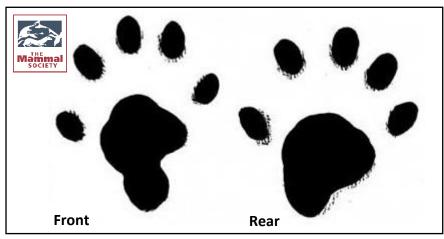


Image 28 - Otter prints. © The Mammal Society

Otter tracks on a clay pad



Image 29 & 30 - Otter tracks in clay pad. © Paul Gambling

Otter tracks in mud

Image 31 - Otter tracks in mud. © Laurie Campbell

3. Brown rat (*Rattus norvegicus*)



Image 32 - Brown rat © Ian Kirk. CC BY 2.0, https://commons.wikimedia.org/w/index.php?curid=30182406

- Small, width of hind foot can be up to 4.5 cm.
- Forefoot print star-shaped, showing 4 toes.
- Hind print elongate showing 5 toes.
- Tail drag rarely present in tracks.



Image 33 - Rat tracks in mud. © Paul Gambling



Image 34 - Rat print in clay pad. © Paul Gambling

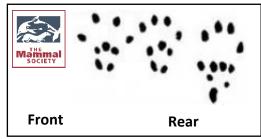


Image 35 - Rat prints. © The Mammal Society

4. Badger (Meles meles)



Image 36 - Badger. © Laurie Campbell.

- Similar width to otter
- 5 toes usually visible in the print
- Claws are further away from the toe pads



Image 38 - Badger print. © The Mammal Society



Image 37 - Badger tracks in mud. © Paul Gambling

5. Squirrel



Image 39 - Grey squirrel. © Laurie Campbell.



Image 40 - Red squirrel. © Laurie Campbell.

Grey squirrels (*Sciurus carolinensis*) and red squirrels (*Sciurus vulgaris*) leave similar prints, however the former leave slightly larger footprints. Prints can be very variable and therefore can often be confused with mink.

- 2 cm wide.
- Toe pads are far from the heel and claw marks far from toe pads, which results in an elongated print.
- Prints show 4 front and 5 hind toe pads.



Image 41 - Squirrel tracks in clay pad. © Paul Gambling

Image 42 & 43 - Squirrel tracks in mud. © Paul Gambling



Image 44 & 45 - Squirrel tracks on clay pad, note claws and size of toe pads. © Paul Gambling



Image 46 - Squirrel prints. © The Mammal Society

6. Pine Marten (*Martes martes*)



Image 47 - Pine martin © Laurie Campbell

Compared to American mink, pine martens are;

- Slightly bigger.
- Have dark brown fur with a distinctive cream throat and bib.
- Ears are rounded and fringed with pale fur.
- Longer legs.

Field signs

Pine martens general are found in woodland, but will also live in scrub, rocky areas and crags.

Scats;

- Single deposit.
- Often contain hair and bine.
- Variable in size 40 -120 mm in length and 12 mm thick.
- Black in colour.
- Sweet smelling.



Image 48 - Pine martin scat © Lizzie Croose/Vincent Wildlife Trust

Tracks

- Very similar to mink and ferret.
- 5 toes.
- 3.5 4 cm width.



Image 49 - Pine Marten print. © The Mammal Society



Image 50 - Pine martin tracks in mud © ratites - CC BY-NC 4.0,

https://static.inaturalist.org/photos/92941539/original.jpg?1598 951194 Invasive non-native species

7. Coypu (Myocastor coypus)

Due to the impact upon native biodiversity, under the Invasive Alien Species (EU) Regulation coypu are classified as rapid response species. If a coypu or their field signs are detected or suspected, contact NIEA Invasive Species Team immediately; <u>invasivespecies@daera-ni.gov.uk</u> or 028 9056 9558.



Image 50 - Coypu © Gzen92 - CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=89894418

Coypu are a large, semi-aquatic rodent native to South America. It is approximately 1m in length. Has dark fur with a white muzzle, small dark ears and a long cylindrical tail. Large bright orange tooth.

Field signs

- Digging out of roots and rhizomes.
- Piles of cut and chewed vegetation, including reeds, grass and roots, with large bite marks (up to 17mm) may be found in or near water. (Booy *et. al.*, 2015).

- Hind footprint up to 15cm long.
- Imprint of webbing often visible.
- Up to 5 claw marks in hind and fore print.
- Shallow tail scrape up to 2cm wide sometimes present.

Scats

- Large, 11x70 mm in length, 2x7mm wide.
- May be curved with longitudinal ridges.
- Lozenge-shaped often contain fish bones and scales.
- Dark brown or green.
- Deposited in water or randomly on bank.



Image 51 - Coypu scat © Xabier Etxarri - CC BY-NC-ND 4.0, https://api.gbif.org/v1/image/unsafe/https%3A%2F%2Fobserv ation.org%2Fphotos%2F25489065.jpg



Image 52 - Coypu scat © Xabier Etxarri - CC BY-NC-ND 4.0, <u>https://observation.org/photos/25591654.jpg</u>

8. Muskrat (Ondatra zibethicus)

Due to the impact upon native biodiversity, under the Invasive Alien Species (EU) Regulation muskrat is classified as rapid response species. If a muskrat or their field signs are detected or suspected, contact NIEA Invasive Species Team immediately; invasivespecies@daera-ni.gov.uk or 028 9056 9558.



Image 53 - Muskrat © AJ Laansma - CC BY-NC-ND 4.0, https://observation.org/photos/4889161.jpg

The Muskrat is a semi-aquatic rodent, with a rat like appearance. It has a broad head, short ears and a scaled tail which is laterally flattened. Has a musky odour.

Scats

- Cylindrical with blunt edges.
- 15mm in length.

- Up to 5 claw marks.
- Fore 35 x 35mm.
- Hind 60 x 65mm.
- Strong tail drag.



Image 54 - Muskrat footprint © USFWS https://commons.wikimedia.org/w/index.php?curid=69193109

9. Raccoon (Procyon lotor)

Due to the impact upon native biodiversity, under the Invasive Alien Species (EU) Regulation muskrat is classified as rapid response species. If a raccoon or their field signs are detected or suspected, contact NIEA Invasive Species Team immediately; invasivespecies@daera-ni.gov.uk or 028 9056 9558.



Image 55 - Raccoon © Ivy Main, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=11842465

Distinctive appearance, with black and white ringed tail and face mask. Size of a large cat.

Scats

• Similar to that of a medium sized dog.

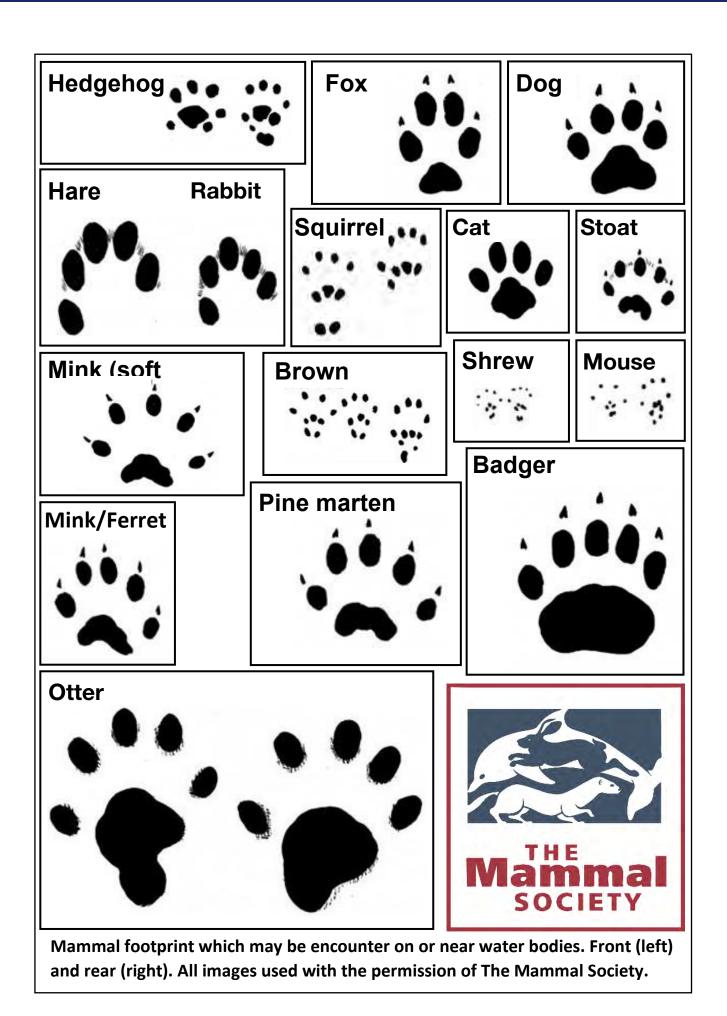
Tracks

- Long toes and small pad.
- Forefoot print 7x7 cm, star-shaped and usually shows 5 toes with claws
- Hind print is more elongated.



Image 56 - Raccoon tracks in mud © ncwetlands.org - CC0,

https://commons.wikimedia.org/w/index.php?curid=8 7020854



Appendix 2 - Mink fencing

1. Order on housing mink and fencing of mink farms

Danish Ministry of the Environment and Food (BEK Regulation no. 265 of 28/03/2006). Available at: <u>https://www.retsinformation.dk/Forms/R0710.aspx?id=31661</u>

Annex 1 - Requirements for the fence around farms or facilities, lists the following;

- 1. The fence must be constructed, mounted and placed in such a way and be of such a height that the minks cannot climb it.
- 2. Access through the fence for driving traffic must be through gates or gates fitted with catch arms. Doors or gates for other traffic must be fitted with an automatic closing device.
- 3. The corners of an enclosure must be provided with a corner cover, cf. section 2, no. 3.
- 4. Fences established or renovated after 2 October 1999 must be at least 150 cm. high and must be led at least 50 cm. into the ground, which must be stamped firmly.
- 5. Fences erected before 2 October 1999 can be approved if the height is at least 140 cm. and the fence is led at least 20 cm. into the ground and otherwise meet the requirements.
- 6. At least the top 50 cm. of the fence must be lined on the inside with such a smooth material that the minks cannot climb up the fence, or be provided at the top with at least 25 cm. wide horizontal deflection of smooth material towards the farm.

2. Newfoundland and Labrador Regulation 38/12 - Fur Farming Regulations (2012).

Available at: https://www.canlii.org/en/nl/laws/regu/nlr-38-12/latest/nlr-38-12.html.

Appendix 3 - Trap signage

Trap signage which should be clearly displayed nearby (see example below). It will help reduce the risk of trap interference and therefore avoid any unnecessary stress to a trapped animal.

Due to their impact upon native biodiversity this cage has been deployed to reduce the population of the invasive non-native **American mink** in this area.

Under The Wildlife (Northern Ireland) Order 1985 as amended, it is a criminal offence to release an American mink back into the wild.

Please do not interfere with this cage, you may injure yourself or get bitten.

For further information please contact

Name:

Telephone:

Email:

Appendix 4 - Mink trapping recording form

Comments						
Non-target species tracks in clay pad						
Non- target species captured						
Age	Juvenile					
A	Adult					
Sex	M/F					
	Other					
Dispatch	Firearm					
	Trap on land					
	Trap on raft					
Mink signs	Sightings					
	Scats					
	Tracks on clay					
Site or trap/raft Mink signs Dispatch Sex Age Non-	number. Grid reference or location.					
	Dale					

Complete this for



Northern Ireland Environment Agency Klondyke Building Cromac Avenue Gasworks Business Park Lower Ormeau Road Malone lower Belfast BT7 2JA

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