RSPCA Wildlife Rehabilitation Protocol: Rabbits and Hares

RSPCA

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Photo: Leveret in care at East Winch Wildlife Centre, RSPCA.

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Protocol for the rehabilitation of Rabbits and Hares.

Contents:

Note: highlighted sections of text are areas where further research is required.

1 Introduction

The RSPCA's Wildlife Centres and the Wildlife Department have prepared a series of husbandry protocols for the different species that are admitted to the Wildlife Centres.

The protocols have been produced by amalgamating the working practices from each centre into one document which has then been discussed at a workshop before being agreed by RSPCA staff. Any areas where agreement cannot be reached are then highlighted as areas for future research.

Where possible, an expert (from outside the RSPCA) on the behaviour and ecology of the species in question was invited to attend these workshops so they could offer advice and comment.

These protocols are based on the experience and knowledge of our wildlife centre staff and are supported by research demonstrating their success. They are subject to review and updates will be added as and when required. New protocols will also be added over time.

This protocol contains general information only. The RSPCA makes no warranties, representations or undertakings about any of the content of the protocol (including without limitation any as to the quality, accuracy or fitness for any particular purpose of such content).

References in this protocol to any person or organisation do not represent an endorsement of that person or organisation, or its members, products or services.

To the extent permitted by law, the RSPCA does not accept liability for any loss arising out of or in connection with the use of this protocol.

2 Species information

2.1 Species or group of species covered by this protocol

Group name - Lagomorphs

Species common name: Rabbit
Species scientific name Oryctolagus cuniculus
Species common name: European or Brown Hare
Species scientific name Lepus europaeus
Species common name: Mountain or Blue Hare
Species scientific name Lepus timidus

2.2 Identification of species covered by this protocol

Adults			
Feature	Rabbit	Brown Hare	Mountain hare
Length of ears	60-70 mm	90-105 mm	60-80 mm
Length of hind feet	75-95 mm	130-135 mm	125-170 mm
Male avg weight	1.5 - 2kg	3.5 kg	2.7 kg
Female avg weight	1 - 1.5 kg	3.7 kg	2.9.kg

Table 1: Basic biometrics of adult rabbits and hares.

All species look similar but note differences:
Rabbits are smaller than hares, with proportionately shorter ears and hind legs. Both species of hare also have black tips to the ears. Mountain hares are more compact than brown hares, with shorter ears. The tail of the mountain hare is also white top and bottom.

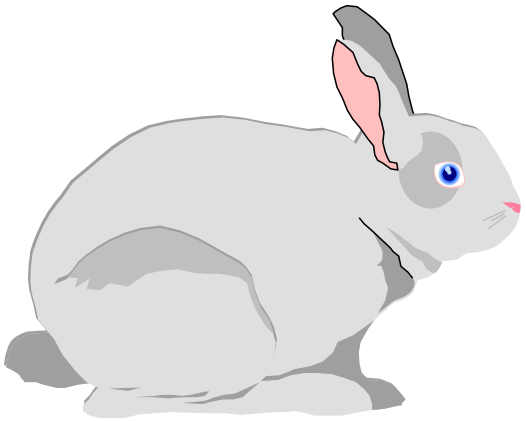


Fig 1: Rabbit

Young
Rabbit: Usually called kittens. Average birth weight 55-60g. Born bald, blind and deaf. Head is very large compared with body and the back is very long. Birth weight should double within the first week and kitten should now be covered in fur. Eyes open 8 – 10 days and at 18 days the kitten will emerge at the burrow entrance. Average litter size is 5, varies between 2 and 8. Weaning is initiated at 3 weeks. Emerge from burrow at 18 days onwards.
Hares: Usually called leverets. Born fully furred, smaller versions of adults. Average weight on birth is 100g. Eyes, ears and noses are fully functional.

2.3 General information on species (or group) as relevant to care in captivity

Rabbits are social animals, often living in large communities, in a system of underground burrows called a warren. A hierarchical system exists within the warren, with a dominant males and females. These animals will use landmarks near the warren to communicate their dominance through scent; such landmarks could be molehills or other obvious features. The density of rabbits in a warren will vary depending on the resources available. Rabbits living in high densities are more prone to disease particularly myxomatosis, as high densities allow the rapid spread of the disease from rabbit to rabbit. In areas where the habitat is unsuitable for digging, rabbits will live above ground where there is dense undergrowth or other forms of cover. Peat moorland is an example of such a habitat. When rearing young, rabbits have adopted an absentee method, whereby the mother will leave her offspring in their underground nest, returning only once every 24 hours to feed them. This mechanism has evolved to reduce the risk of predation.
Rabbits will breed most of the year, with most litters being born between January and June. They can be sexually mature at four months, and so are capable of a high reproductive rate, but this can also be controlled. If the warren is very overcrowded, the doe will not give birth, but will reabsorb her litter. Most wild rabbits will not live to one year old.

Hares can breed any time of year, but most breeding is between February and April. They tend to be solitary, coming together in loose groups to feed, which they do probably to increase their chances of detecting predators and for courtship. Hares do not burrow; instead they live in shallow depressions in the ground called forms, where they can be almost undetectable by sight. When a female gives birth to leverets, she does so above ground and like rabbits, she leaves them for 24 hours between nursing bouts. The leverets will move away from each other and lie crouched low against the ground until their mother returns, about one hour after sunset. They will then return to the birthplace to be nursed. It is likely that many leverets are picked up and brought to wildlife centres because they have been found, on their own, by well meaning members of the public, who believe the leverets to have been abandoned.

All three species tend to be most active at dawn and dusk, although they will be active at night, and, more rarely, during the day.

Habitat:
Rabbits prefer pasture fields with surrounding hedgerows for cover. However, they are adaptable and can be live on sand dunes, roads and railway embankments and the borders of deciduous woodland.
Hares are more to be found in open landscapes, such as pasture, arable land and even airfields. They are less restricted by the lack of cover than rabbits.

2.4 Diet

Both rabbits and hares are herbivores, primarily eating grasses and herbs found in pasture. Short grass is preferable and is maintained by constant grazing, and mountain hares also eat upland grass and plant species, including heather. Rabbits and hares also do a lot of damage to commercial crops such as hares eating wheat and barley and rabbits eating the vegetable crops of market gardeners.

Both use a specialised method to ensure that they get the most from their food, called refection. Rabbits and hares have guts that are specialised in digesting plant material, including a caecum and appendix containing many bacteria. However, their food requires a great deal of digestion, and so these animals eat their food twice. They do this by producing two types of dropping – one is soft, moist and covered in mucus and is immediately eaten by the animal (refection); the second is hard and dry and these are conventional droppings. By eating the soft, moist pellets, called caecal pellets or caecotrophs, rabbits and hares are able to extract more of the nutrients they require. This normally occurs during the day, when the rabbits are underground, or the hares are lying in their forms. Young animals probably eat their mother's caecotrophs in order to build up the levels of bacteria required in the gut.

The diet of rabbits and hares must contain very high amounts of fibre to ensure their guts and digestion system remains healthy. This should also be presented in such a way that the teeth are used appropriately for slicing and grinding and do not become mis-aligned which can led to painful and even fatal conditions later, such as abscesses. The ideal food in captivity is thus hay, in particular meadow hay, fresh grasses and herbs.

2.5 Importance of Environmental Enrichment

All wild animals have particular responses and behaviours which allow them to function in their natural environment. Some of these behaviours may be recent adaptations while others may have developed millennia ago, but all have evolved as responses to various stimuli in their environment. It is important to allow animals to express these behaviours when deprived of their natural environments in order to minimise stress. Minimising stress is an important factor in the care of any animal, and especially for an animal casualty, as increased stress will increase the time it takes to effect a cure.

Environmental enrichment is the term used to describe facilities that are provided for the animal which allow it to express these behaviours. A simple example is the provision of a variety of climbing branches for arboreal species, such as squirrels, or a suitable substrate for animals that dig. The aim is to try and fulfil three requirements of the animal:

- Biological functioning – the ability of the animal to function in its environment;
- Coping – the ability of the animal to maintain itself in response to environmental challenge;
- How the animal feels about its environment.

Environmental enrichment can also play a role in how the animal is managed. For instance, when feeding animals that either hunt or scavenge, the food should be hidden, and challenges provided, so that the animal has to spend time finding and obtaining food, rather than just eating it out of a bowl. A variety of prey types is also important. The fox has a varied diet, depending on location, habitat type and season. This should be reflected in the diet provided, especially with young animals who are learning about what is and is not good to eat.

Environmental enrichment can either be naturalistic or artificial. Either is acceptable, provided that the artificial allows the animal to express natural behaviours.

Suggestions:

Most rabbits and hares spend their time feeding so providing hay as the major, if not 100% of the diet, rather than concentrated food is best form of enrichment (and good for guts and teeth) (hayracks useful)

For hares: bedding that they make into a form e.g. hay; large item e.g. rock that they can lie behind
For rabbits: dark, enclosed space e.g. pipe (difficult to get rabbit out of unless has a section in the top that can be opened) or ‘eglu’ type hutch that is enclosed but allows you access from and view from various angles. Or even a cat litter tray with a cover on it

3 Pre-admission treatment.

Prior to admission, some animals may be held at a veterinary surgery or other facility. Some, if not all, of these facilities may request information on care of the animal, before they send it to an RSPCA centre. This part of the protocol is to detail this information.

3.1 Information should be collected on the following:

a) Species
b) Extent of injuries, evidence of shock
c) Body condition, any previous injuries
d) Age of animal, including weaned or unweaned
e) Location animal was found (important to ensure it is returned to the same place)
f) All records of previous treatment (if from another establishment)

3.2 Advice related to care, e.g. diet, provision of heat etc.

Adult hares are very nervous.
Keep in quiet area, at ground level, away from noise and disturbance.

Adult rabbits: Nervous; ground level, dark / semi-dark, covered area to hide in e.g. one of those cat litter trays that have a cover on it or an Eglu type hutch; away from noise and disturbance

Both species should be kept at room temperature – not too hot.
Both species ideally in a different room from predators – scent is an important detection sense for these animals, the scent of predators in the same room is likely to be stressful

3.3 Advice related to the treatment of particular problems.

Check for Myxomatosis and Viral Haemorrhagic Disease (VHD)

Myxomatosis vaccine - use in consultation with the vet. If used carefully follow the directions for injections. This is currently under review.

3.4 Advice regarding the fitness of the animal for transport.

Care is required when handling. Both species are extremely nervous and spinal fractures may occur during handling.

4 Health and Safety

4.1 Introduction

The RSPCA has developed the Wildlife Centre Protocols to provide guidance and advice on the keeping of certain species of wild animal for rehabilitation. Anybody who intends to treat sick, injured and/or orphaned wild animals must accept that there are risks in doing so. Some wild animals are potentially dangerous and may be capable of causing serious injury. Furthermore, all wild animals have the potential to carry parasites, disease and bacterial infections. Some of these may be passed to humans (zoonoses) or to other animals, either domestic or wild. Barrier nursing methods should be used to minimise the spread of these infections between animals.

4.2 Risk assessments

It is recommended that any establishment admitting rabbits and hares should complete risk assessments for all areas.

This is a brief summary of some of the possible risks and suggested ways to reduce the effects.

Members of public are advised to keep dogs etc away from rabbits and hares.

Hazards	Control measures	Level of risk
Bites and scratches	Gloves to be used when restraining	Low
Diseases	Gloves should be worn when handling Treatment areas must be cleaned thoroughly after examination	Low
Parasites	Gloves should be worn when handling	Low

Table 2: Potential hazards and measures that can be taken to reduce the risk from these hazards.

5 Decision making – to treat or not to treat

5.1 Information should be collected on the following:

a) Species
b) Extent of injuries, evidence of shock
c) Body condition, any previous injuries
d) Age of animal, including weaned or unweaned
e) Location animal was found (important to ensure it is returned to the same place)
f) All records of previous treatment (if from another establishment)

Age range	Birth	7-10 days	10-14 days	14-21 days	21-28 days	28-35 days
Rabbits	30g	100 – 130g	113 – 140g	100 – 180g	106 – 206g	128 – 258g
Hares	100g	112 – 207g	166 – 284g	220 – 414g	301 – 665g	418 – 759g

Table 3: Approximate age ranges for juveniles based on weight on admission

5.2 Triage

Options for the animal are: euthanasia, treatment or immediate return to the wild.
The considerations listed below will help to guide this decision.

5.2.1 Assessment relevant to the condition of the animal

a) Unweaned rabbit kittens are difficult to hand rear well and there are high mortality rates at different stages of rearing, even in the wild up to 75% will die. Do not attempt to rear them unless you have the resources to undertake 1:1 feeding. If not, euthanasia is recommended for these animals.
b) New born kittens <100g euthanase due to poor success rates.
c) Is the animal very seriously injured or in immediate need of veterinary care? (Multiple injuries give a poor prognosis)
d) Rabbits - fracture of spine can occur when handling
e) Hares - fracture of spine can occur when handling

Immediate release

a) Juvenile hares with no injuries can be returned to <u>exact</u> location where found.

5.2.2 Assessment relevant to the Centre and the management of the animals

e.g.

a) Is a vet available to see the animal?
b) Is there appropriate housing/space available to accommodate the animal?
c) What are current staffing levels?
d) What is the predicted intake of animals in the short term?
e) Temporary marking to identify individuals?

5.3 Treatment on admission

5.3.1 If any of the following proceed to vet exam

Juveniles:

Cat injuries - Thoroughly examine rabbit for any puncture wounds. Clean if necessary with 2% solution povidine/iodine or flush with warm sterile saline then proceed to veterinary examination.

Adults:

Adult rabbits are difficult animals to treat – many are put to sleep on admission due to their injuries.

Road traffic accidents – Signs are often dragging of the hindlimbs in which case feel for any obvious steps in the spine and absence of pedal reflexes (although this is not a reliable indication). Vet may radiograph if in doubt. Confirmed spinal fracture – Euthanasia

Multiple limb fractures – Euthanasia will be necessary as all released rabbits must be fit and agile to escape predators.

Shot injuries – signs may vary depending on which part of the body has been shot. Radiograph may be required to assess the extent of damage and to ascertain treatment required.

Infection by *Encephalitizoon cuniculil* may be possible, although not yet confirmed in wild rabbits. However some rabbits have been presented showing a 'head-tilt' – a classic symptom.

During warm weather any injured rabbit should be thoroughly examined for signs of fly eggs or maggots, these should then be removed

Very few adult hares have ever been admitted to RSPCA Wildlife Centres.

5.3.2 Possible disease risks

Admitting wild rabbits into an establishment does pose the threat of spreading of myxomatosis or VHD to either wild (or domestic) rabbits already in care. It is recommended that a protocol be agree with the vet to reduce the risk of this.

It is also recommended that all rabbits with myxomatosis be sprayed with frontline immediately after euthanasia before the body cools and the fleas leave it. The carcass should then be sealed in a bag once death is confirmed and disposed of immediately.

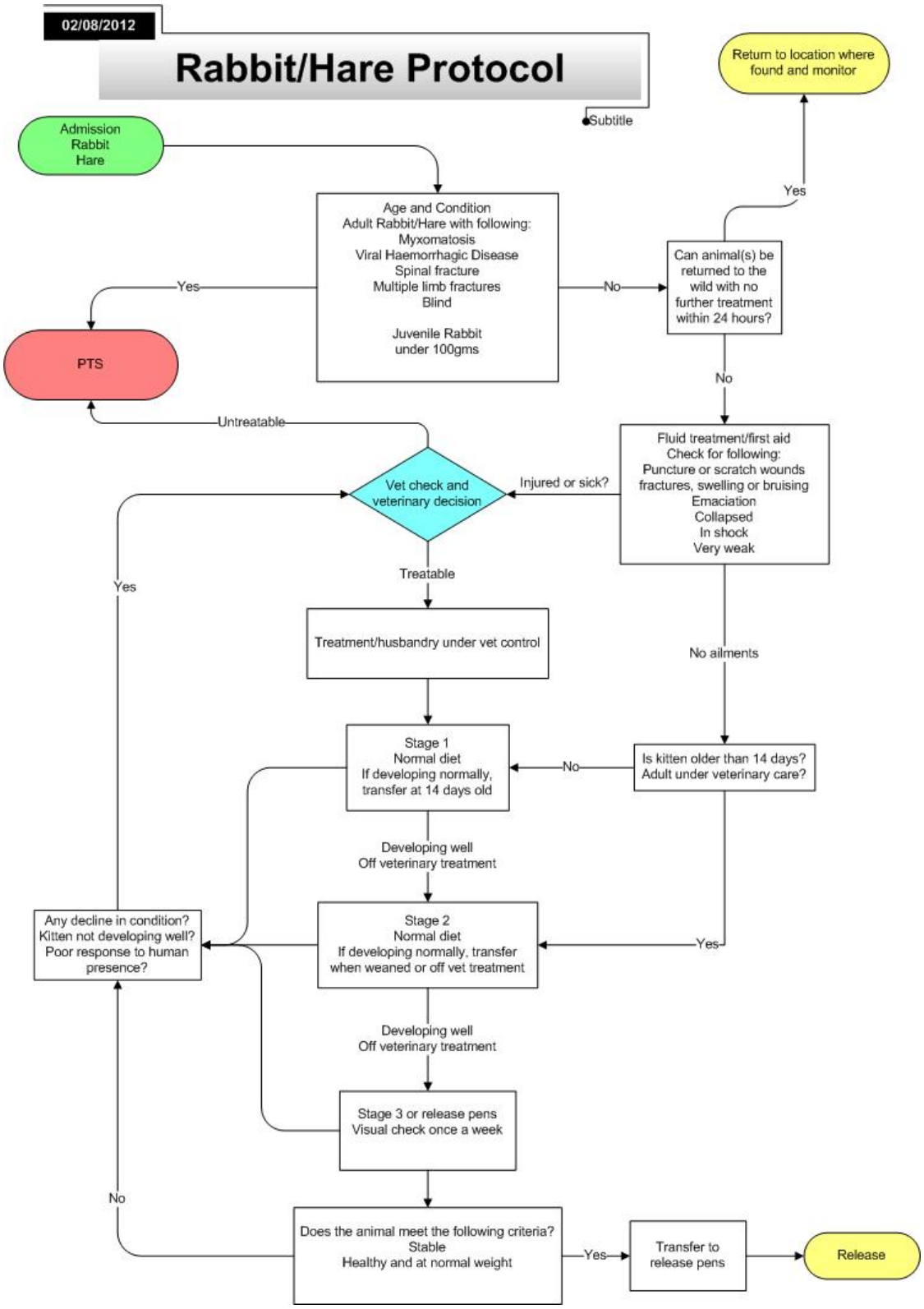
The three most common diseases of wild rabbits are in table 3.

Fig 2: Five week old rabbit.

DISEASE	MYXOMATOSIS	Viral Haemorrhagic Disease (VHD)	COCCIDIOSIS
CAUSE	Virus	Virus	Protozoal parasite
TRANSMISSION	Direct, indirect * and parasitic vector. E.g. rabbit flea	Direct, indirect. Fleas, blowflies and mosquitoes transmit the disease. Virus survives several weeks in carcasses.	Ingested oocysts, which can survive for years in the environment.
SIGNS	Swollen eyes, ears and genitalia, nasal and ocular discharge. Blind from swollen eyes.	Depression, fever, collapse, haemorrhagic discharge from nose, haematuria, sudden death.	Weaning juveniles most susceptible. Inappetence, weight loss, diarrhoea, abdominal distension, depression, dehydration and death. Faecal examination confirms diagnosis.
PROGNOSIS, TREATMENT, CONTROL	Incubation 2-8 days. Prognosis poor. Due to the suffering, high mortality rates and risk of infection to other rabbit's euthanasia is carried out.	Incubation 3-4 days followed by very high mortality rate due to haemorrhaging within organs of the body. Disinfection of pens with diluted sodium hypochlorite and quarantine all rabbits. No specific treatment.	Can be treated, vet to prescribe treatment and fluid therapy. Often paediatric suspension of trimethoprim/ sulphamethoxazole.
PREVENTION	Vaccinate all healthy rabbits over 6 weeks of age	Vaccine available	Avoid stress, good husbandry with minimal disturbance. Disinfection of hutches/pens between rabbits with 10% hypochlorite solution.

Table 4. Most common diseases of wild rabbits.

5.4 Flow chart



6 Stages of care

Clearly indicate where differences exist for Adults and Young.

6.1 Stage 1 intensive care for very young rabbits (less than 2 weeks old)

Enclosure
A large plastic container (66 x 36 x 45 cm) (such as a voyager or other commercial pet carrier) or cardboard pet carrier are ideal. Place a small-enclosed cardboard box inside with a hole cut in one side as an entrance. Lay a soft towel on the floor of the box and pack the box with hay to provide a dark nest (similar to the burrow they would have come from). Even young rabbits try to keep the nest clean from urine and will often go outside the nest.
The litter, whatever the size, must be kept in a quiet room to decrease stress levels and avoid habituation.

Lighting requirements
Rabbits: Dim/dark (they are born underground)

Substrate
Lined with newspaper, hay and a towel to hide in. Commercially available vet bed can also be used.

Temperature
Room temperature is normally adequate –the litter can normally keep themselves warm enough in the nest. In rare cases a heat pad can be placed under a ⅓ of the container (or protected cable if the heat source is in with the rabbits).

Access to water
Always provide water for rabbits once their eyes are open but use a very small shallow bowl away from the nest area.

Diet
Introduction: In captivity, milk replacements are a poor substitute for a doe's milk therefore more feeds are required. Feed three times daily, 8am, 2pm and 8pm. When taking decent amounts (5mls) and the weight of the kitten is increasing, stop the 2pm feed and increase the amounts given during the 8am and 8pm feed. The amount of milk can be increased slowly up to 15 – 20ml however, any sudden changes could result in diarrhoea. Time and patience are required with feeding kittens and the number of staff handling and feeding the rabbits should be kept to a minimum to avoid alterations in handling techniques etc.
Excess milk around the kitten's mouth should be gently wiped away after feeding to prevent fur loss; milk should also be kept away from the nose area to avoid inhalation.

Fig 3: Two week old leveret being syringe fed.

All feeding solutions should be warmed to body temperature as this is more akin to the milk that would receive from the doe. If feeding a large litter check the milk temperature is constant and re-warm if necessary. Supplements can also be added, such as Science - Recovery: 1 large pinch, and/or Biolapis – Probiotic – 1 pinch

Equipment: Use a catac standard teat on a 1ml syringe for the first feed. As the rabbit becomes accustomed to suckling the size of the syringe should be increased to a 2ml, 5ml and finally a 10ml syringe. Ideally make up enough milk for one feed only. Between feeds, utensils should be kept in a Milton solution as good hygiene is very important in order to prevent enteritis.

When moving to solid food, the use of extruded pellets, such as Excel, are recommended, rather than commercial rabbit mix, as rabbits tend to pick at the latter and so may not receive all the nutrients they need.

Hares
The requirements for leverets are very similar to those described above, but as young hares are precocial, their needs are not as demanding as they are for very young rabbits.

Rabbits	Hares
• weigh daily before feed • feed from syringe with mikki teat which should be stored in Milton • rinse teat before and after use • use a new syringe each time • 100-200g bodyweight try 15ml/feed • check for soiling around perineum, and also milk encrustation around chin • check for bloating (excess gas in stomach) • observe faeces and urine in cage. Alert supervisor to any problems • offer 10 pieces Dried Excel in bowl, 10 pieces of dampened Excel in bowl and 10 mls Esbilac in a bowl, water in a separate bowl, and dried forage • amounts can be increased if self feeding is evident • Whenever possible, experienced staff will feed new arrivals until sucking well, and at weaning when starting to eat for themselves	• weigh daily before feed • check for bloating before and during feeding. If concerned seek veterinary advice • ensure teat is rinsed thoroughly in water before and after use • use a new syringe each time • check for soiling around perineum • wipe chin after each feed to avoid milk encrustation • there is no need to toilet leverets. • check for bloating (excess gas in stomach) • observe faeces and urine in cage. Alert supervisor to any problems • offer 10 pieces of Dried Excel in bowl, 10 pieces of dampened Excel in bowl, 10 mls Esbilac in a bowl, water in a separate bowl, and dried forage • amounts can be increased if self feeding is evident • Whenever possible, experienced staff will feed new arrivals until sucking well, and at weaning when starting to eat for themselves

Rabbits: Quantity		Frequency
on admission, 2 - 5ml each feed feed from 2ml syringe with mikki teat. Increase slowly up to 15ml over time.	1st feed ¾ Lectade, ¼ Esbilac 2nd feed ½ Lectade, ½ Esbilac 3rd feed ¼ Lectade, ¾ Esbilac then just Esbilac can include tinned cream – 1/3 cream, 2/3 esbilac (SGWC)	3 times daily, 8am, 2pm, 8pm
Hares: Quantity (based on admission weight)		Frequency

< (less than) 140g bodyweight c 15ml/feed 140-200g bodyweight 20ml/feed 200-300g bodyweight 30ml/ feed over 300g increase feeds – as much as demanded. .	1st feed ¾ Lectade, ¼ Esbilac 2nd feed ½ Lectade, ½ Esbilac 3rd feed ¼ Lectade, ¾ Esbilac then just Esbilac	3 to 4 daily, 8am, 2pm, 8pm Twice daily

Environmental Enrichment

Kittens are able to pass urine and faeces of their own accord and because they will venture to the edge of the nest to do this it is easy to monitor and observe levels and condition of urine and faeces. If kittens are not passing, stimulate the genital area by gently rubbing with a piece of damp cotton wool.

Note: If is often easier to sit on the floor with a towel on your lap in order to feed the kitten (keep the same towel each time as the smell will help to relax the rabbit). Having two kittens on your lap at the same time also helps them to relax. Kittens are capable of moving very quickly and sitting on the floor helps to prevent injury if they should fall.

When to move to next stage:

At 14 days old.

Kittens can be marked using any non-toxic tippex or similar marker, but as they clean their own fur from approximately 8 days of age it is likely to be groomed off. Clipping the fur in a different area for individual rabbits is a longer lasting identification method.

6.2 Stage 2 Juveniles over 2 weeks and Injured Adults

Enclosure

Rabbit hutch or large voyager/pet carrier (89 x 60 x 67 cm) for more space. Their nest box or a small pet carrier on its side can be used as a hiding place in the hutch for security.

Keep voyager low down or on floor. Rabbits only – If the pet carrier has a wire mesh door of large mesh size, place cardboard of door to prevent them putting their heads through the wire.

Rabbits and hares (perhaps hares more so) may benefit from a run area, ideally free access, in order to be able to exercise and ensure adequate bone density, muscle growth and physical dexterity. However if the young animals need to be caught to be hand fed, it is recommended that such access be limited at this stage.

Fig 4: Young rabbit in stage 2 enclosure.

Substrate
Use newspaper on the floor with hay in the sleeping area to hide. Temporarily, a small pet carrier may be used, but place a towel over the newspaper to provide a more secure footing for the rabbit.

Small bowl of water should be available at all times.

Diet		
Quantity Only offer small amounts of fresh food at first and watch for bloat. Suggest: Infacol or Fibreplex mixed with milk feeds to prevent bloat	Juveniles: Good quality meadow hay and Excel should be provided fresh every day and fresh grass and dandelions twice daily. <u>Weaning</u>: From two weeks of age leave a small shallow dish of the same milk mix in the cage/hutch. Between feeds add a small amount of Excel and porridge oats, fresh grass, dandelions, carrot, spring greens, and hay to nibble on. Continue syringe until orphan is maintaining/gaining weight, or refuses teat. Decrease the quantity and number of milk feeds until completely weaned at 3-4 wks. Adults: Meadow hay fresh grass, dandelions, carrot, spring greens, Excel and porridge oats	Frequency Change fresh food twice a day.

Environmental Enrichment
Juvenile rabbits should be kept in groups as they are social animals but ensure any new admissions have been de-fleaed and quarantined in small numbers before adding to a larger group as myxomatosis can take up to 10 days to incubate. Only human contact with the rabbits should be at feed times. As soon as they are weaned contact should be decreased to once daily to avoid the rabbits habituating with humans.

Enteritis: On first sign of diarrhoea treatment should be administered rapidly and should include fluids to combat dehydration, either orally, s/c or intravenous. Increase fibre content by syringe feeding a recovery diet or similar rabbit probiotic critical care formula. Examine faeces under a microscope for coccidiosis, if positive the vet will need to prescribe treatment.

When to move to next stage:
Juveniles: When weaned – once feeding on own and maintaining weight
Adults: When fit – straight to release

6.3 Stage 3 Older juveniles and Recovering Adults

Enclosure

Once weaned, rabbit kittens can be placed in an outside grass run with their hutch provided the rabbits are unable to dig or climb out. Mesh will need to be dug at least 1 ft down and under and the run should have a mesh top to prevent predation. The outside run should be placed in a quiet area with human contact allowed only once daily, for feeding and monitoring, to avoid high levels of stress.

Note: If the outside run is in the vicinity of wild rabbits then the young rabbits must be vaccinated against Myxomatosis, which cannot be administered until at least 6 weeks of age.

Alternatively, juveniles could can be placed in a soft release enclosure – approx 2.5m x 1.5m x 0.5m. Timber frame covered with wire, including base. Release hatch at one end and access hatch on top.

Wooden box placed inside with hay in for bedding. And enrichment in pen: e.g. logs and pipes for cover.
Adults: Should be place in a pen if required to assess locomotion and behaviour.

Substrate
Grass

Shelter
Hutch and pipes, logs etc.

Access to water
Ceramic water bowl available at all times

Diet
Meadow hay and Excel pellets
Natural food, e.g. fresh grass and dandelions apple and green vegetables e.g. curly kale. Feed as much natural food as possible, as sudden dietary changes can cause stress and lead to coccidiosis

Environmental Enrichment
Pipes and tunnels should added to provide places for the rabbit to hide in which are more natural and burrow like than just the hutch.

When to move to next stage:
Rabbits: 250 - 400g for release
Hares: 800 to 1,200 g for release

Fig 5: Rabbit being placed into an outdoor enclosure.

Fig 6: Rabbit outdoor enclosure and standard pet carrier.

7 Preparation for release

7.1 When and where to release

Permission must be obtained from landowners but farmland should be avoided, ideally the area should consist of short grass with some longer grass, hedges or shrubs in the near vicinity for cover.
Be wary of a large population of rabbits in a small area, as resident rabbits may not accept newcomers. Note: we have monitored hand-reared rabbits released into an artificial warren within other rabbits' territory and no adverse interactions were observed however, more monitoring is required.
Juveniles released must be fearful of humans, dogs and cats. Vaccinate against myxomatosis at 6 weeks of age prior to release.

Rabbits:
Both young and adult hares are hard released.
Juveniles can be released into suitable habitat.
Adults as far as possible should be returned to where found. Release at dusk or early morning on grassland near cover with landowners permission

Hares:
Both young and adult hares are hard released.
Rehabilitated hares should only be released where there are other wild hares in suitable habitats including grassland, set-aside, meadows and some arable fields, especially if bordered by hedgerows and herbaceous fringes. Sites away from roads should be selected where possible.

7.2 Tagging

For short-term monitoring, fur clipping of hand-reared rabbits allows monitoring from a distance with binoculars. Ear tags may also be suitable.
Further monitoring of both hares and rabbits is required, to see how they survive and integrate into the wild population. It seems likely that radio tracking would be the only suitable method to achieve this.

8 Areas for research

Survival of both species post release.
Do rehabilitated rabbits integrate with local, wild, colonies?
Bacterial development in the gut – are caecotrophs required, or probiotics?
Use of artificial pheromones to encourage feeding.
Use of vaccines in animals to be released to the wild.

9 References

List any useful reference information for treatment and rehabilitation of this species

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10 Annexes