

RSPCA Wildlife Rehabilitation Protocol: Thrushes

RSPCA

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Mistle thrush being fed at RSPCA Wildlife Centre

**Protocol for the rehabilitation of the bird group
Thrushes (family Turdidae)**

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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.

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Notes:

Areas highlighted within the text are areas that require further research or further clarification.

All dimensions and weights are in metric units.

All area measurements are for length x breadth x height (L x B x H).

2 Species information

2.1 Species covered by this protocol

Ornithologically speaking, the thrush group (family Turdidae) is a very large group that contains over 300 species world-wide. For the UK alone this would make it a very large group to deal with in one protocol, as it includes – from the UK - nightingales, stonechats, whinchats, all the wheatears and redstarts, the robin and all the named “thrushes”. However this protocol will only consider the following:

English Name	Scientific name
(Common) Blackbird	<i>Turdus merula</i>
Mistle thrush	<i>Turdus viscivorus</i>
Song thrush	<i>Turdus philomelos</i>
Redwing	<i>Turdus iliacus</i>
Ring ouzel	<i>Turdus torquatus</i>
Fieldfare	<i>Turdus pilaris</i>

Table 1: Species covered by this protocol

Names in brackets indicate the full name according to the current British Ornithological Union’s British bird list¹.

2.2 Species Identification

2.2.1 The adult bird

Blackbird: The adult male (cock bird) is all black with a yellow-orange beak and eye-ring. The female (hen bird) is a uniform dark brown above which becomes paler underneath; the female’s chin can be very pale almost white and she has a brown beak. The legs are dark brown/black.

Ring ouzel: This bird is very similar to the blackbird in size and behaviour. Rather more brown than black plumage with a white crescent across the breast. It has silvery wings and a pale yellow bill that may show a black tip. Female has dull white crescent and white scaly flecks on breast and belly. The ring ouzel is a summer visitor.

Song thrush: The crown, back, rump and tail are uniform brown. The underparts are mostly white neatly spotted with black although the upper breast ground colour is more buff with speckles. A small patch of streaks and spots behind the eye is quite noticeable. The legs are pale pink. Orange or “golden-buff” underwing in all ages is diagnostic.

Mistle thrush: Noticeably the largest of all of these species. Greyer overall appearance to its plumage than the song thrush but otherwise is much the same. Particular differences, apart from its size are; no buff on the upper breast, white outer tail feathers, white around the eye, white underwing and the legs are somewhat yellow-pink.

Redwing: Very slightly smaller than the song thrush. Plumage is similar throughout but the redwing has a noticeable bold white eyebrow stripe and rust-red flanks. Legs are somewhat yellow-pink. A winter visitor to Britain although some are resident in Scotland where they may breed.

Fieldfare: Grey crown and nape of neck, brown shoulders and upper wings, grey rump and black tail. White breast with black chevrons and speckles, upper breast buff with speckles. Legs are dark brown to black. A winter visitor to Britain (although it occasionally breeds in small numbers).

For weights of wild adults see Table 3 on page 19

2.2.2 The young bird

Blackbird: Fledgling: Pale orange brown spots and streaks on brown head, nape and upper back; rest of back brown. Breast and belly orange-brown with darker brown spots. Bill black and legs grey/dark brown.

Immature: Much the same as the female in colour i.e. uniform rufous-brown all over with faint spots and streaks on the breast. May show more extensive pale patch on throat. Moulting through in the male to leave brown wing patches and black beak during first winter.

Ring ouzel: Fledgling and Immature: Sooty black plumage with pale scaly appearance to breast and belly. Young males show pale crescent on breast females have no crescent. Black beak.

Song thrush: Fledgling and Immature: As adult but with pale streaks down nape and upper back and less clear spots on breast and neck. Pale buff around eyes. Underwing colour orange.

Mistle thrush: Fledgling and Immature: As adult but with speckled and streaked head and upper back on buff-grey feathering. Generally more speckled overall than adult. Underwing is white.

Redwing: Immature: As song thrush but with noticeable rust-red flanks and pale eyebrow stripe. Fledglings are a very rare occurrence in the UK.

Fieldfare: Immature: Nape and back greyish with pale speckles and scales. Notably more randomness to spots and flecks on breast and belly. Dark beak. Dark flesh coloured legs. Fledglings are a very rare occurrence in the UK.

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

- All species take a wide range of food including insects, molluscs and fruit.
- All except the ring ouzel are regularly found in gardens. The blackbird is very common in rehab care at all times of the year.
- All species appear to be very territorial except during the winter months when most species will tolerate small groups. In some years redwings and fieldfares may be found in flocks of hundreds especially where there is a good food source.
- There is a migration in all species. Although many individuals are sedentary rarely leaving their established territories.
- The ring ouzel is only a summer visitor.
- The fieldfare and redwing are winter visitors. Small numbers of each of these species regularly breed in Scotland and there are some individuals that breed throughout England and Wales as far south as Kent.
- Migrants from the continent boost winter numbers of blackbird, and song thrush.
- All these birds can be found equally at home in trees, hedgerows and open fields and meadows. Some are surprisingly agile taking berries from the ends of twigs.
- The mistle thrush is one of our earliest breeding species with young often found as early as the second half of March. However, although the peak breeding period for the blackbird and song thrush is March to July nests and young may be found at almost any time of the year.
- Blackbirds may produce three broods in a season with young from one brood being fed while the female is sitting on the subsequent brood.
- All daylight hours spent collecting food whilst rearing broods.
- All species may form mixed flocks during winter.

2.4 Notes on environmental enrichment

Enrichment suggestions

- All species will forage actively in leaf litter and lightly composted flower borders and vegetable patches.
- Areas to forage and explore for food items may be particularly important. Note that all species will use grassland and fields during the winter months as well as hedgerow trees and gardens.
- Winter migrants are particularly fond of berries and will spend long periods foraging in hedgerows for these fruits.
- The song thrush is well known for its use of flat stones as an “anvil” to smash open snail shells.
- Recordings of the British dawn chorus played to young birds through the indoor rearing period is considered desirable to enable good song development in later lifeⁱⁱ.



Fig 1: Young mistle thrush being fed a strip of ox heart

3 Pre-admission treatment.

This part of the protocol is to provide information for telephone queries regarding the thrushes and their rehabilitation, prior to receiving the bird(s) at an RSPCA Wildlife Centre. There are two possible scenarios:

- i. A member of the public is reporting a sick/injured or orphaned thrush and wants further information as to what to do.
- ii. Prior to admission, some animals may be held at a veterinary surgery or other facility and may have had treatment. Some, if not all, of these facilities may request information on care of the animal, before they send it to an RSPCA centre.

Does the bird need to be admitted? Try to determine if the bird needs treatment, if it can be “treated” on site or left alone?

NOTE: in all cases ensure that the bird is really in need of care. Where necessary consult the Society’s “Leave me Alone” campaign material.

3.1 Information should be collected on the following:

- a) Species (often a location of finding or time of year can help with identification),
- b) Extent of injuries, evidence of shock,
- c) Body condition, any previous injuries,
- d) Age of animal, nestling, fledgling or adult
- 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.

- Keep adults isolated - young may be housed together.
- Keep away from cats and other predators.
- Once bird is warm, keep it at room temperature.
- A cardboard box is ideal, short-term emergency housing. Keep box covered. The approximate size of the box should be 210mm x 280mm x 120mm.
- Keep the box covered and in a quiet room.
- Ensure good ventilation while at the same time keeping the light levels in the container low.
- Offer water in a shallow dish, for rehydration only. Remove dish before transport.
- Keep disturbance to a minimum.
- Transport to carers as soon as possible. In which case feeding is generally unnecessary for adults, but for diets – see below.

3.3 Advice related to the treatment of particular problems.

- Concussion – post trauma (e.g. window strike) do not offer water.
- Handle with care and keep handling to a minimum to reduce feather damage and/or loss.

3.4 Advice regarding the fitness of the animal for transport.

- Ensure transport container is not too large and is provided with a non-slip base (e.g. a clean towel).
- Ensure good ventilation while at the same time keeping the light levels in the container low.
- A small - 210mm x 280mm x 120mm - cardboard box is the most suitable. For further transport details see above.
- **DO NOT** use wire baskets as feathers may get caught and result in feather damage.
- Ensure the container is provided with a non-slip base (e.g. towel). No other item should be in the transport box.
- Remove water dish before transport.

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 birds 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 use gloves or a suitable alternative (e.g. towel) when handling small birds and to keep dogs etc away from injured wildlife.

Hazards	Control measures	Level of risk
Bites and scratches	Gloves to be used when restraining	Low
Diseases/Zoonoses	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 (often a location of finding or time of year can help with identification).
- b) Extent of injuries, evidence of shock.
- c) Body condition, any previous injuries.
- d) Age of animal, nestling, fledgling or adult.
- e) Location animal was found (important to ensure it is returned to the place of finding).
- f) All records of previous treatment (if from another establishment or vet surgery).

5.2 Triage

5.2.1 Assessment relevant to the condition of the animal

Options for the animal are: euthanasia, treatment or immediate return to the wild.

The considerations listed below will help to guide this decision as many of these conditions indicate a poor survival to release. Call the RSPCA Wildlife Centres for further advice.

Euthanasia is recommended for animals showing the following.

- Compound fractures (including exposed bones)
- Missing eye or limb
- Any deformity most often of the beak
- Old necrotic wounds (including those that are fly-blown)
- Individual birds that are *in extremis* or clearly moribund
- Naked and blind nestlings are usually euthanized.
- Where feathers are of poor quality. Feather quality and the structure of the plumage should be carefully considered. If there is poor quality and structure combined with other deleterious factors then euthanasia is recommended. See section 6.3.

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

- Is an experienced vet, wildlife assistant or wildlife centre supervisor available to see the animal within an appropriate time-scale?
- Is suitable housing/space available to accommodate the animal according to this protocol?
- Are current staffing levels sufficient to give the bird(s) the time required for good rehabilitation?
- What is the predicted intake of animals in the short term?
- Admission numbers will be controlled carefully to avoid overcrowding.

5.3 Treatment on admission

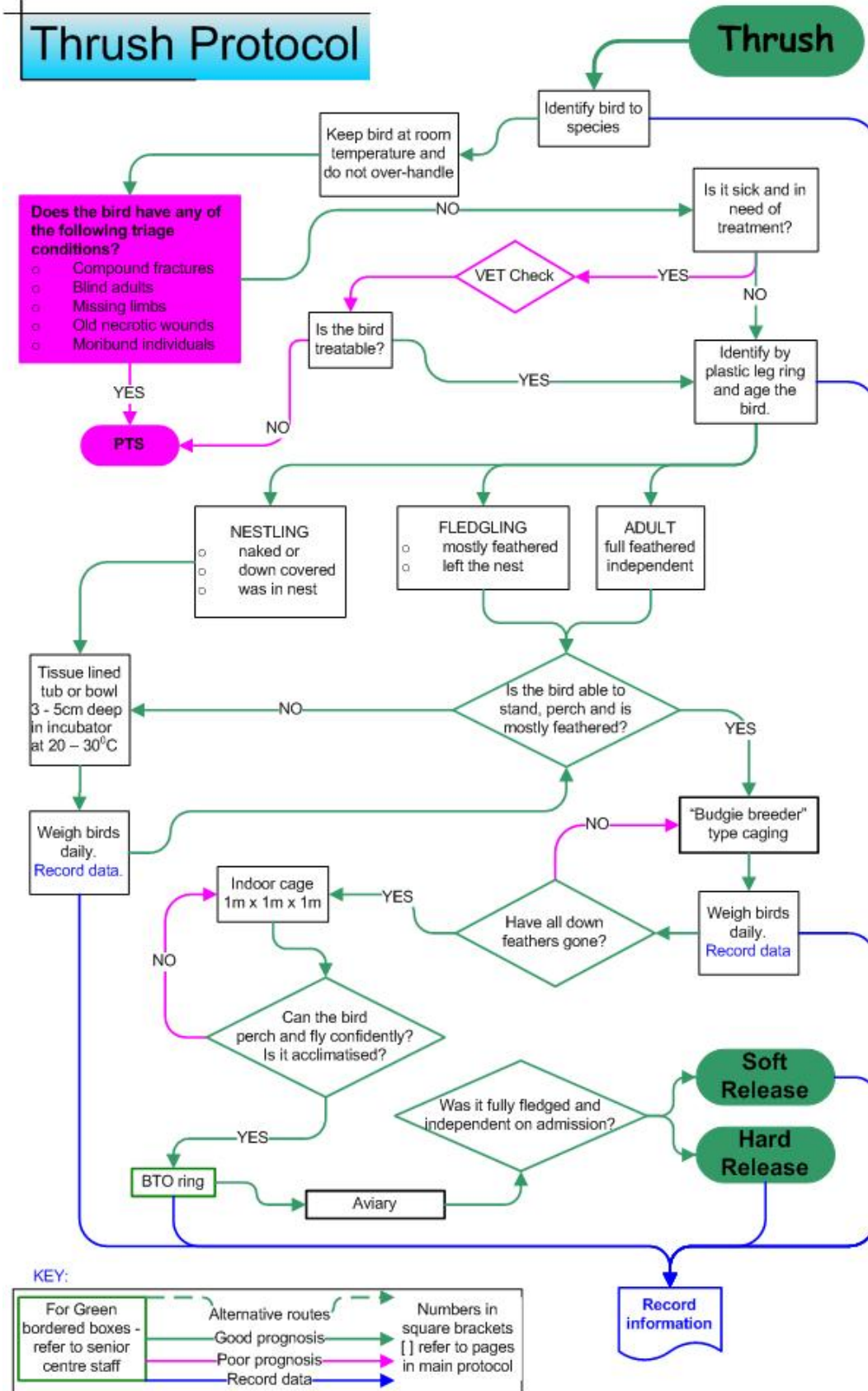
5.3.1 If any of the following are identified proceed to vet examination.

- Refer all birds that are the result of suspected cat attack.
 - Warmth is usually required for all birds that are not fully feathered.
- For further information regarding veterinary intervention see the BSAVA Manualⁱⁱⁱ.

5.3.2 If none of the problems identified in 3.3.1 are identified.

- If numbers of birds are arriving it will be prudent to identify each bird to track its progress. Simple plastic rings may be advised.
- Weighing adults on arrival may help with a prognosis.

5.4 Flowchart



6 Accommodation

The need for **Environmental Enrichment** should be considered and identified wherever possible for each of the following sections, 6.1 to 6.5:

6.1 Indoor 1 (Intensive care)

For part-feathered nestlings with eyes open, recently fledged individuals or near moribund individuals (occasionally naked and blind nestlings).

Enclosure - Incubator

- Separate all nestlings from feathered and near-fledged nestlings – the latter will not need additional heat (see later).
- A small artificial nest can be constructed from cardboard, ceramic bowls or plastic tubs. Sharp edges must be avoided.
- Do not use wild nests as parasites may cause a problem.
- Paper towelling can be used to line the “nest”. It is important to ensure that any liner is non-slip so that the young bird’s growing legs do not “splay” and result in permanent disability.
- Individuals of same species and age can be mixed in small nests up to normal brood size (3-4).
- The nest(s) containing one species can be accommodated within the same incubator as the nest(s) of another species.
- Ideally birds should be marked but their small size may prevent this. Where marking is possible, coloured plastic rings or small plastic split rings may be used.
- Sick or injured individuals that should have fledged can be housed individually in incubators until stabilised.
- Clean and sterilise all equipment between feeds in, for example, *Milton*.
- Good hygiene should be observed at all times.

Substrate

- The incubator should be lined with a towel for easy cleaning.
- Each nest should be lined as above.

Lighting requirements

- These young birds must have access to natural daylight for good tissue development. Ensure natural daylight penetrates the incubator
- No additional lighting is required – room lighting is sufficient.
- Normal daylight hours are sufficient.

Temperature

- Nestlings with part feathering and still in the nest should be kept at a steady temperature of 25° – 30° C. Incubators are ideal for this purpose.
- Feathered but not fledged birds can be kept at room temperature

Ventilation

- See humidity below.
- Good ventilation is required at all times.
- Care should be taken to avoid excessive condensation by limiting numbers of individuals per incubator and providing good ventilation. This may depend on incubator design.

Humidity

- See ventilation above.
- If keeping single birds and/or small broods, some moisture will be required, however, excessive condensation should be avoided. Larger groups will produce enough moisture – but do not overcrowd incubators.

Access to water

- Via hand feeding.
- Shallow dish for use with sick, moribund fledglings

Environment Enrichment

- Sibling contact is usually sufficient.
- Recorded bird song played as backgroundⁱⁱ.

6.1.1 When to move birds from Indoor 1 to Indoor 2

- Birds will be:
 - ✓ moving out of “nest” and hopping around incubator.

- ✓ covered by feathers all over the body.

6.2 Indoor 2 (less intensive monitoring)

Enclosure

<p style="text-align: center;">FLEDGLINGS</p> <ul style="list-style-type: none"> ▪ Bright alert and fully feathered individuals can be transferred out of the incubator into larger containers. ▪ The nest from the incubator can be placed into a cage until the birds no longer use it. (Do not use wild nests.) ▪ Cage dimensions 600 mm x 480 mm x 460 mm, with a wire mesh front. The mesh should not allow the birds' head through. ▪ Four birds of blackbird size can be held in a cage of this size. ▪ Wire front allows essential good natural light penetration but must be partially covered with towelling or newspaper to allow birds a secure retreat area. ▪ These cages are kept indoors. 	<p style="text-align: center;">INDEPENDENT, FULLY GROWN BIRDS (IMMATURES AND ADULTS)</p> <ul style="list-style-type: none"> ▪ All birds are initially housed and assessed in a cage, 600 mm x 480 mm x 460 mm, with a wire mesh front. ▪ Wire front allows essential good light penetration but must be partially covered with towelling or newspaper to allow birds a secure retreat area. ▪ Cages to be kept indoors in a quiet, secure area. ▪ Four birds of blackbird size can be held in a cage of this size.
<p>Substrate</p>	
<ul style="list-style-type: none"> • These birds need a non-slip substrate. Newspaper base with a tissue or towelling covering. Or alternatively, plastic mesh with 5mm holes can be used to line the base. 	<ul style="list-style-type: none"> • These birds should be able to control their legs but will nevertheless appreciate a non-slip base. • Newspaper base with a tissue or towelling covering.

Lighting

- Normal/natural room lighting
- Normal day length.

Temperature

- Normal room temperature

Ventilation

- Good ventilation is required at all times.

Humidity

- As room

Access to water

- Fresh water must be available at all times.
- Shallow containers are to be provided so that birds may use them for bathing. Max depth 5cm.

Environmental Enrichment

- Clean, natural wooden perches are ideal.
- Natural twigs provide a range of sizes and rough surfaces.
- Add twigs with leaves from non-poisonous plants. These will provide a variety of perching opportunities, cover and a possible food source.
- Sufficient perches must be provided to allow all birds comfortable perching facilities. Birds do not like to feel crowded.
- Ensure the main perches are positioned so that they allow each bird sufficient headroom and enough space to open its wings comfortably without damaging them. They must also be placed so that the bird's tail does not get damaged.
- Food and water bowls must not be placed under perches.

6.2.1 When to move birds from Indoor 2 to Indoor 3

- Birds will be:
 - ✓ bright, alert and active,
 - ✓ gaining ability to fly onto perches,
 - ✓ feeding well on its own without support,
 - ✓ attempting escape (flight) when approached.
- Birds should be individually identified at this point.

6.3 Indoor 3 (an outdoor aviary could also be used for this stage)

Enclosure

<p style="text-align: center;">FLEDGLINGS</p> <ul style="list-style-type: none"> • Birds can be transferred to these larger cages when they are starting to explore. • Cage dimensions 1170 mm x 480 mm x 460 mm, with a wire mesh front, so birds can be fed through the wire mesh. • Four birds of blackbird size can be held in a cage. • Wire front allows essential good natural light penetration but must be partially covered with towelling or newspaper to allow birds a secure retreat area. • These cages are kept indoors but should be kept in a quiet, secure and cooler room to allow them to acclimatise. • Alternatively, the birds can be transferred to an indoor aviary approx. 8' x 8' x 9'. 	<p style="text-align: center;">INDEPENDENT, FULLY GROWN BIRDS (IMMATURES AND ADULTS)</p> <ul style="list-style-type: none"> • Budgie breeder type cages are ideal for all species of thrush. • All birds are initially housed and assessed in a cage, 1170 mm x 480 mm x 460 mm, with a wire mesh front. • Wire front allows essential good light penetration but must be partially covered with towelling or newspaper to allow birds a secure retreat area. • Cages to be kept indoors in a quiet, secure area. • Alternatively, the birds can be transferred to an indoor aviary approx. 8' x 8' x 9'.
Substrate	
<ul style="list-style-type: none"> • These birds need a non-slip substrate. • Newspaper base with a tissue or towelling covering. • Plastic mesh, 5 mm holes, can be used to line the base • The use of sheets is recommended for an indoor aviary 	<ul style="list-style-type: none"> • These birds should be able to control their legs but will nevertheless appreciate a non-slip base. • Newspaper base with a tissue or towelling covering. • The use of sheets is recommended for an indoor aviary

Lighting

- Normal/natural room lighting
- Normal day length

Temperature

- Normal room temperature

Ventilation

- Good ventilation is required at all times

Humidity

- As room

Access to water

- Fresh water must be available at all times.
- Shallow containers are to be provided so that birds may use them for bathing.

Environmental Enrichment

- Clean perches made of natural material are ideal.
- Natural twigs provide a range of sizes and rough surfaces.
- Add twigs with leaves from non-poisonous plants. These will provide a variety of perching opportunities, cover and provide a possible food source.
- Sufficient perches must be provided to allow all birds comfortable perching facilities.
- Birds do not like to feel crowded.
- Ensure the main perches are positioned so that each bird has sufficient headroom and enough space to open its wings comfortably without damaging them. Perches must also be placed so that the bird's tail does not get damaged.

- Food and water bowls must not be placed under perches.
- For the aviary, a shallow tray of soil, peat, leaf litter or similar may provide additional foraging stimulus. Food may be scattered through this to further encourage activity.

6.3.1 When to move from Indoor 3 to Outdoor 1

- No bird on veterinary treatment will be placed in the aviary (outdoor 1)
- Birds will:
 - ✓ have clean plumage (inc. vent),
 - ✓ the ability to fly onto perches,
 - ✓ be bathing confidently with feathers drying well,
 - ✓ scatter when approached,
 - ✓ be alert, active and bright,
 - ✓ show tail feathers that are longer than wing tips when the wings closed,
 - ✓ be of good weight and/or body condition.

6.4 Outdoor 1

Enclosure

NOTE: All birds must be able to self-feed, fly and perch well before being placed in an outside aviary.

- Decisions on a bird's fitness to move to an aviary should remain with a senior member of staff.
- Birds should be moved to an outside aviary during good weather.
- Minimum aviary dimensions are 6m x 2m x 2.5m. This is suitable for a maximum of 10 immature blackbirds.
- Species can be mixed but birds must be of a similar age.
- Timber frame, with three solid plywood walls and one wall with external 12 mm welded mesh, lined internally with 5mm stiff plastic mesh. Roof is same as mesh lining wall. Secluded area should be provided using plywood sheets.
- A porch and a second door provide security for the main entry door. Aviary door should open inwards, porch door outwards.

Substrate

- A concrete base is ideal as it is easily kept clean and prevents unwanted rodent access, but should be topped with a layer of gravel at the front of the aviary and sand at the back. Ensure good drainage.
- Substrates must be kept clean and, as far as practical, free of pathogens.

Shelter

- Roofed areas and side protection must be available in aviaries so that birds have protection from strong winds, rain and other inclement weather.
- Most of the remaining aviary roof is open to the weather.
- Other vegetative cover should be available for protection and retreats. See Environmental Enrichment - below.

Access to water

- Fresh water must be available at all times. Must be changed daily to prevent possible disease.
- A variety of containers in different sites will provide alternative drinking and bathing opportunities. Water to a depth of approximately 5cm.

Environmental Enrichment

- Perches should be provided at different heights at either end of the aviary to allow free flight.
- A variety of twiggy branches will provide a range of perching both moveable and static. If leaves are available this will provide additional stimulus and feeding opportunities.
- Bushy shrubs can be planted in regularly used aviaries for cover and will act as a food source. Small shrubs in pots may provide variety and offer a chance for plants to recover out of the aviary.
- Food and water bowls must not be placed under perching areas.
- Natural branching, although the best all round, must be refreshed/renewed frequently to maintain cleanliness and their enrichment value.
- A stone area (paving slab) is provided as an "anvil" for song thrushes.
- A tray of freshly dug soil provides additional foraging opportunities. Food items can be put in this to add to enrichment.
- Lengths of 150 mm diameter plastic pipe (1 m long), can be placed on the ground to provide shelter for blackbirds.

- Planting can be provided on the open mesh wall – plants such as honeysuckle are ideal as they attract insects.

6.4.1 When to move birds from Outdoor 1 to Outdoor 2, Release (or Release Pen)

This section describes the stage of development at which animal is considered fit for release.

- Decisions of whether a bird is fit for release will remain with a senior member of staff.
- Birds will be:
 - ✓ bright, alert and active,
 - ✓ flying strongly, able to make good height and when in flight turn well at the end of aviary,
 - ✓ showing good quality feather condition with complete feather covering that is fully waterproof,
 - ✓ showing no waxy sheath covering any of the feathers, and
 - ✓ maintaining a good weight (see weight table on page 19).

6.5 Outdoor 2 (Release pen)

Enclosures

- Portable aviaries can be used for release pens.
- Sizes are 6m x 2m x 2m.
- Doors as per outdoor 2.
- Timber frame panels with 19mm welded mesh on three sides and solid back wall. Roof is half mesh and half covered.
- A release hatch is provided at the front.

Substrate

- Depends on site – no additional substrate is used.

Shelter

- Can be provided by using dense foliage.

Access to water

- Fresh water must be available at all times. Must be changed daily to prevent possible disease.

Environmental Enrichment

- As outdoor 1

7 Food & feeding

Every effort should be made to mimic the animal's natural food as closely as possible. If this is not possible, a semi-natural diet is provided. Artificial alternatives are not recommended, but may be available for emergency use.

Where nestling, fledgling and adult diets differ, these are clearly detailed.

Fresh drinking water must be available at all times for all birds that are not being hand-fed.

7.1 Food in the wild

7.1.1 Adults

All species feed on a similar range of foods which includes:

- A variety of invertebrates: beetles, spiders, earthworms slugs and snails (song thrush uses an "anvil" then wipes extracted snail on ground/perch)
- Fruit: windfall apples, pears, plums; currants and berries of all kinds.
- In spring and early summer the ring ouzel feeds mostly on invertebrates, for the rest of the year berries make up the greater proportion.
- Almost all the thrush species toss leaves aside looking for invertebrates just like the blackbird

7.1.2 Young (including nestlings and fledglings)

- Much the same diet as the adult but with a strong preference for invertebrates and little or no fruit until the young have left the nest.
- Fruit tends to be taken much later in the year when it is freely available as a wild crop.

7.2 Captive diet

7.2.1 Adults

Basic ingredients for all species include:

- "Insectivorous" food, e.g. *Sluis Universal*, *Prosecto*.
- Mealworms, earthworms
- Poultry growers pellets
- Fruit, e.g. cut apple or pear, whole blackberries, haws, sloes, blackcurrants, and raspberries all fruit is important for the overall health of the bird^{iv}.
- Plain scrambled or chopped hard-boiled egg
- Some grit (e.g., bowl of earth, silver sand).

All food is to be provided fresh, at least twice daily. Shallow, steep sided bowls are ideal for mealworms to prevent their escape. Preferably provide live insects in shallow tray of leaf litter or soil. Given this way it will provide additional environmental enrichment. Where fruit is provided it has been shown that black fruit is preferred^v as this contains high levels of antioxidants.

7.2.2 Young

Dependent and non self-feeding individuals.

Basic ingredients for all species include:

- "Insectivorous" food, eg *Bogena*, *Prosecto*, *Orlux*
- Mealworms, earthworms.

Other ingredients include:

- Thin strips of raw ox heart dipped in *Prosecto* and supplemented with mealworms
- 50% Harrison's juvenile hand-feeding formula and 50% Morrison's puppy food mixed together and fed using a spatula.
- Harrisons on its own fed using a 1 or 2ml syringe.
- Young that require hand feeding will usually gape for food. This allows small pieces of food to be placed in the mouth, which the bird swallows.
- Moistening – not wetting - the food with fresh water helps the bird to swallow and provides fluids.

- Birds should be presented with adult food in a bowl when moved to Indoor enclosure 2, as well as being hand fed.
- Reduce the frequency of hand feeding when:
 - ✓ Sudden weight increase (only seen in bird's that are weighed daily).
 - ✓ Increased competitive behaviour,
 - ✓ Observed self-feeding.

Independent and self-feeding individuals

- As these birds may have been out of the nest for a short period of time they are unlikely to freely gape for food.
- Provide appropriate food in bowl and allow the bird(s) to recognise it for themselves. Selection of foods from adult diet.
- "Insectivorous" food, eg *Bogena*, *Prosecto*, *Orlux*.
- Mealworms, earthworms.
- Poultry growers pellets mixed with mealworms.

7.3 Frequency of feeding

7.3.1 Adults

- Food provided *ad libitum*.
- Freshened at least twice daily.

7.3.2 Young

- Dependent young may require feeding every 20 - 30 minutes with as much food as they will voluntarily take at that "sitting".
- Feeding from 07.00 to 20.00 hours should be adequate.

7.4 Supplements

- Anti-worming drugs can be administered before the birds are moved to outdoor aviaries but this should be administered in consultation with your vet.

7.5 Feeding and environmental enrichment

- Provide live invertebrate food in shallow trays of leaf litter or light soil for indoor enclosure 3 onwards
- Provision of fruit (eg. apples, pears; soft fruit when in season) for indoor enclosure 3 onwards.
- Hedgerow fruits in season can be provided on the twigs so the birds can remove them.

7.6 Notes on feather development

7.6.1 Feather quality

Both poor quality feathers and fret marks may be caused by deficiencies in diet, stress or both. Work on birds of prey and species of passerine bird have shown that poor diet during the growth of the feathers, either while the bird was in the nest or during normal moult, can cause weak feathers and poor plumage. It may lack lustre and iridescence, the colour may be poor and there may be a general dishevelled look to the bird. The feathers may feel dry and "straw-like" and the feather edges look worn and tatty. The plumage may also contain broken and bent feathers.

Poor feather quality may mean that flight may be severely affected or impossible. The plumage may also not be waterproof and so may result in the bird being unable to maintain body temperature.

7.6.2 Fret marks

Fret marks show in feathers as lines across the vane; they may also show as ragged breaks, splits and "cuts" in the edges of the feather - [see photograph below](#). These abnormalities are caused by inadequacies in the diet while the feather is growing. The result may be a significant flaw in the feather frequently leading to breaks across the line of weakness. These conditions are of particular concern when found in one or more of the following feather groups; primaries, secondaries or tail feathers.

7.6.3 Importance of diet

Poor feather quality is a problem that can be avoided by providing a proper diet. It is therefore important to follow a good quality dietary regime such as that outlined above. Failure to do this can result in birds having to be kept for extended periods as they would not be fit for release at the correct time, or possibly euthanasia if the damage to the feathers is too extensive.

8 Preparation for release

8.1 Preparing the animal for survival

- Provision of environmental enrichment throughout the bird's time in care should have allowed "training" and individual skill development to take place.
- Note the provision of feeding enrichment and the use of relevant audio stimulusⁱⁱ.

8.2 When to release

A range of factors must be considered in preparation for release

- A morning release gives the bird/s time to find food, shelter and orientate themselves before dark.
- Dry periods of weather are not particularly good for many invertebrates (e.g. worms slugs & snails) meaning that some wild food items may be in short supply.
- Moist mornings provide better times for most invertebrates.
- Access to autumn berries may provide essential feeds during winter periods.
- Comparison with the weights of wild adults will assist in the assessment of a bird's readiness of birds for release.

Blackbird - ♂ & ♀ 90 – 125g	Mistle thrush - ♂ & ♀ 100 – 150g
Ring ouzel - ♂ & ♀ 90 - 138g (on migration)	Redwing - ♂ & ♀ 50 – 75g
Song thrush - ♂ & ♀ 65 – 100g	Fieldfare – ♂ & ♀ 80 – 120g

Table 2: Weights for wild adult thrushes

8.3 Where to release

- Where possible, adults should be returned to the site of finding.
- Hedgerows may provide a suitable habitat for all species during the winter months.
- Gardens (both public & private) are also suitable habitats for many of the species involved. (Particularly the blackbird, and song thrush)
- Reedbeds are also a suitable habitat for release.

8.4 How to release

- Birds can be released into areas where habitat is capable of providing them with food resources throughout out the year, regardless of season, e.g. reedbeds, town gardens with feeding stations.
- Soft release may be required for juveniles in areas where food resources may be limited at certain times of year. Adults returning to the site of finding are hard released.
- Some supplementary feeding may help in both situations.

8.5 Pre-release information and data

Measurements to be taken prior to release.

- Weight and basic biometrics may prove to be useful data.
- Sexing birds as far as possible is always valuable.

8.6 Marking requirements or tagging

- All birds should be ringed with BTO rings.
- Remove any temporary identification marks including rings.

9 Areas for research

Areas that need further research include:

- Growth rates, age milestones and weights for all young thrushes in care.
- Diets for immature birds.
- Naked and blind – do they survive to release?
- Recorded bird song as environmental enrichment.
- The effects of mixing species.
- Post release survival.

10 Annexes

10.1 Glossary

♀; ♀♀	Female; females
♂; ♂♂	Male; males
Adult	A bird in full adult plumage. See descriptions, page 3 Section 1.2
Biometrics	Measurements taken to provide greater detail on the biology of birds. Data includes: plumage, size(s) and condition. (Further detail can be found in the <i>Ringers' Manual</i> ^{vi}).
BSAVA	British Small Animal Veterinary Association
BTO	British Trust for Ornithology
Fledgling	In this protocol; a young bird that is recently out of the nest but still mainly reliant on its parents for food and (to a certain extent) protection. It is feathered and can fly albeit weakly at first.
Immature	A young bird that is independent of its parents but that has not developed its full adult plumage.
Molluscs	A large group of animals which in this protocol refers mainly to snails and slugs.
Nestling	In this protocol; a young bird that is still in the nest (or should be) and which may not have all its feathers. It will be unable to fly. It is totally dependent on its parents for food.
PTS	Put to Sleep (humane destruction, euthanasia)
Sexual dimorphism	The difference in appearance between male and female. Usually noted in plumage colour, shape or size.

10.2 Product details

Avimix	A vitamin supplement prepared specifically for birds. <i>Vetark Professional, PO Box 60, Winchester, SO23 9XN.</i>
Avipro	A probiotic prepared specifically for birds. <i>Vetark Professional, PO Box 60, Winchester, SO23 9XN.</i>
Harrison's (juvenile hand-feeding formula)	A formulated bird food, available in powdered form. <i>Dr. Brian & Sheila Stockdale, Unit 7 Windmill Road, Loughborough, Leicestershire, LE11 1RA. www.harrisonsbirdfoods.com</i>
Milton	A sterilising solution available through most general chemists eg, <i>Boots</i>
Prosecto Insectivorous	A pre-prepared insectivorous food with crushed dried insects and a range of other foods bound together with oils and baker's honey. <i>J E Haith Ltd, 65 Park Street, Cleethorpes, N. E. Lincolnshire, DN35 7NF</i>
Sluis Universal	An insectivorous food similar to <i>Prosecto</i> (above) and available through many pet stores.

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