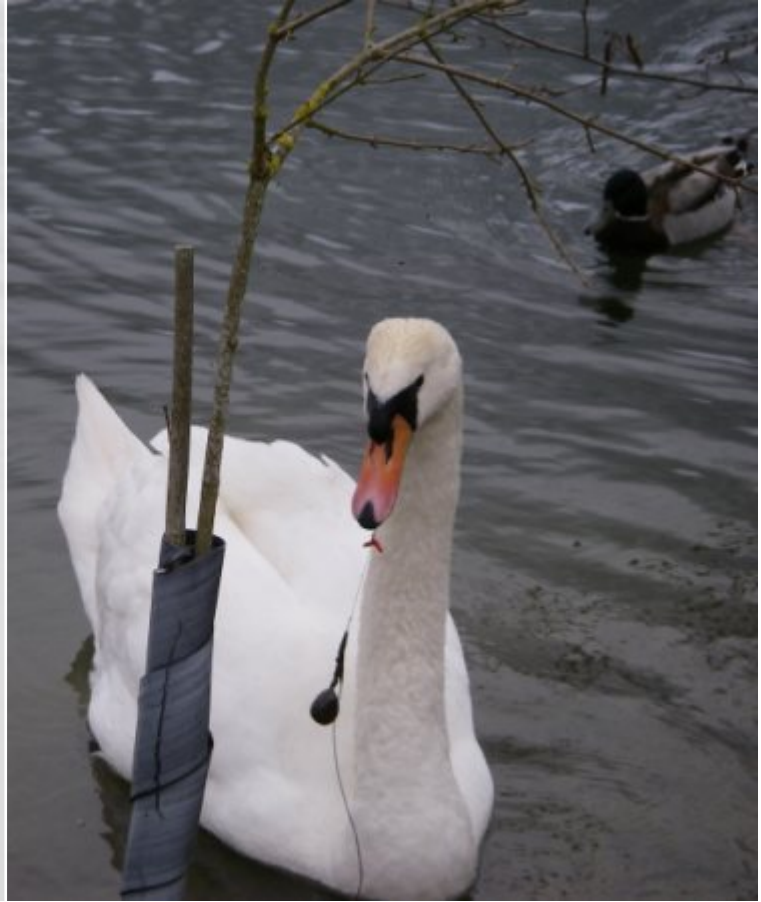


# RSPCA Wildlife Rehabilitation Protocols: Swans

RSPCA

2013



Swan with fishing tackle in mouth © RSPCA

**Protocol for the rehabilitation of the birds group**  
**Swans (Genus Cygnus)**

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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).

## 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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## 2 Species information

### 2.1 Species or group of species covered by this protocol

There are three species of swans that visit the UK regularly:

1. Mute swan; *Cygnus olor*
2. Bewick's swan; *Cygnus columbianus*, (Known also as the tundra swan.)
3. Whooper swan; *Cygnus cygnus*.

There is also a black swan *Cygnus atratus* that may be brought into care but these are not native and must not be released (back) into the wild<sup>1</sup>. However, if they are otherwise fit and healthy they should be found permanent homes in captivity.

### 2.2 Identification of main species covered by this protocol

#### Adult

All three species of adult swans are large, white and quite unmistakable. However, confusion may arise between the whooper swan and Bewick's swan.

#### Mute swan

The mute swan is the largest of the swans. When adult, it has an orange bill with black edging, large black knob at base of bill, which is larger in the male than the female. The neck usually held in elegant 'S' shape, the beak points downwards. Legs and feet dark grey to black. 'Polish' morph has pink legs and feet; the cygnets are white not grey. The male or **cob** tends to be larger than the female or **pen** and has a larger fleshier knob that may be even more pronounced during the breeding season.

*It is the mute swan that is most likely to be taken into captive care.*

#### Bewick's & whooper swans

Yellow bill with black edging. Neck usually held much straighter than mute swan with beak horizontal. The whooper swan is noticeably bigger than Bewick's. Both species have black feet and legs. The whooper and Bewick's swans walk with greater ease and without the mute swan's "waddle".

#### Young

The young of all the species are called cygnets. And within the group all the cygnets are very similar. Grey fluffy down growing out to brown, buff-grey feathers. (The 'Polish' morph has white feathering straight from the egg.)

The mute swan cygnet has black bill, feet and legs (except 'Polish' morph where they are pink). Whooper and Bewick's cygnets have a pale pink bill and lighter grey feet and legs.

All the cygnets mature through phases of grey and a buff colour to complete white. All birds look like the adult at around a year old and are almost indistinguishable after the autumn moult when they are a year old.

Pair bonding may begin during second winter but they do not normally breed until years 3 or 4.

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

- Mute swans are resident.
- Non-breeding individuals will form large flocks.
- Established adult pairs will (aggressively) defend their territory for most of the year. They are especially aggressive in the spring and if they have cygnets.
- Not all mute swans pair for life, in one study less than half kept the same mate and territory throughout their breeding lives<sup>1</sup>. Removing healthy partners or offspring is therefore both unnecessary and illegal.

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<sup>1</sup> Wildlife & Countryside Act 1981, Section 14. "... if any person releases or allows to escape into the wild any animal which – (a) is of a kind which is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state; or (b) is included in Part I of Schedule 9, he shall be guilty of an offence."

- Cygnets can be found from around the middle of April and are with the parents until September when they move away and find “bachelor” herds where they stay until they are about 3-4 years old and start to look for their own territory.
- Mute swans have a complete moult of flight feathers during July and August that prevents flight for around six weeks. This feather loss may allow black skin to show which may be mistaken for oiling.
- Whooper & Bewick’s swans arrive in the UK during late October and depart during late March to early April.
- A few whoopers breed and other pairs may spend the summer here especially in Scotland.

### 2.4 Notes on environmental enrichment

Young swans are social.

Grazing may be beneficial.

All swans need facilities to allow them to swim



**Fig 1: A mute swan at rest**

## 3 Pre-admission treatment.

This part of the protocol is to provide information for telephone queries regarding the species 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/orphaned swan 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. 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 swan 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. Consult the Society's "Leave me Alone" campaign material.**

### 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 cygnet or adult.
- e) Location animal was found (important for the animal's future release).
- f) Ringed or not ringed.
- g) All records of previous treatment (if from another establishment).

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

- Diets – see below
- Keep adults isolated - young may be housed together.
- Keep away from predators.
- Once warm, keep at room temperature.
- Keep good ventilation.

### 3.3 Advice related to the treatment of particular problems.

Advice should be given regarding Society policy relating to the rehabilitation of permanently disabled casualties.

### 3.4 Advice regarding the fitness of the animal for transport.

- Ensure birds are adequately hydrated before travel
- In warm environments the feet are essential as heat regulators – keeping the feet cool is advantageous.
- Downy cygnets can be more susceptible to heat stress and will need more ventilation.
- Ensure there is sufficient space to prevent (further) injury during transit. Ensure that the humerus does not rub on the carrier.

## 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.

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

Table 1: 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,
- e) Location animal was found if it is to be released
- f) All records of previous treatment (if from another establishment)

### **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.

### **5.3 Assessment relevant to the condition of the animal**

Eggs will not be accepted for hatching.

Euthanasia is recommended for animals showing the following:

- Compound fractures (including exposed bones).
- Blindness in both eyes
- Missing limb.
- Seriously damaged, overshot or undershot beak.
- Individuals that are *in extremis* or clearly moribund.
- 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 7.3.

Rapid release is recommended for the following:

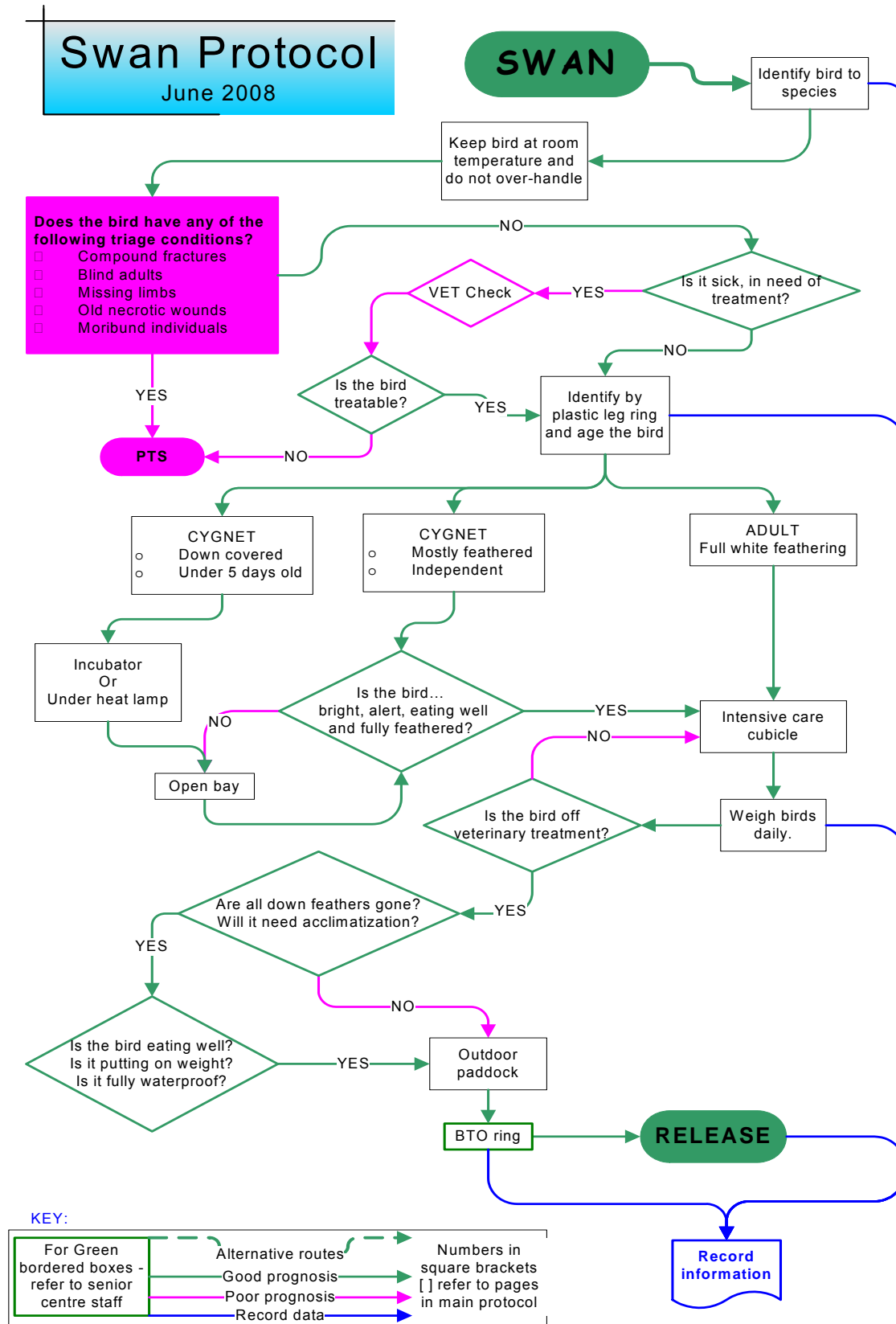
- Cygnets may be accepted by their family if they are returned between 48 and 72 hours. Therefore the decision to release must be made within this period even if this may seem premature. Ensure that the cygnet is accepted.
- Where fishing litter and hooks are removed on site or at a specialist (including a local veterinary surgery) and where there is no obvious injury.
- Uninjured, crash-landed swans may be released at a suitable nearby waterway.

### **5.4 Assessment relevant to the Centre and the management of the animals**

- A long-term holding facility is needed to rear cygnets to adulthood (see later)
- Individual identification via temporary leg ring is necessary when groups are cared for.
- Birds may be weighed when handled to monitor progress and development.
- When disease may be suspected or on veterinary advice birds are kept in isolation for evaluation.
- Where sufficient space is available family groups that include parent and young should be held together unless this is not advised for veterinary purposes or to reduce disease transfer. Detailed records should be kept to enable family groups to be kept together or where necessary reunited.



## 5.5 Flowchart



## 6 Accommodation

The progression from *Indoor 1* to *Indoor 2* to *Outdoor 1* to *Outdoor 2* represents the movement of an animal through the Centre as its condition improves. Not all of the categories will be applicable to all these species, their condition etc. The need for environmental enrichment should be identified and used wherever possible in each of the following sections.

### 6.1 Indoor 1 (Intensive care)

#### Enclosure

##### Cygnets

- Newly hatched and small sickly cygnets may be kept in incubators for four to five days.
- Older cygnets can be kept in bays or intensive care cubicles. 1m x 1.2m is suitable for three cygnets up to a weight of around 400gms.
- Broods larger than three individuals are kept together and enclosure sizes are increased accordingly.

##### Substrate

- These birds need a non-slip substrate – towels or sheets are ideal.
- In incubators, newspaper covered with towels is suitable.
- Clean wood shavings at about 80mm deep are ideal but camping mats or *Astroturf* can be used as alternatives for larger cygnets.
- Do not use hay, straw or similar materials, these may tangle around legs and may even cause respiratory conditions<sup>v</sup>.

##### Lighting requirements

- No additional lighting is required – room lighting is sufficient.
- Normal daylight hours are sufficient.

##### Temperature

- In bays (see above), suitably placed heat lamps for small or sickly individuals provide a temperature gradient (Forbes, In Benyon 1996<sup>v</sup> recommends 32-34°C decreasing by 3° weekly until young are 5 weeks of age)
- In other cases room temperature in the bays is generally adequate.

##### Ventilation

- Good ventilation is required at all times.
- Avoid draughts.

##### Humidity

- With raised temperature, humidity will be slightly raised.
- Ensure adequate ventilation to avoid stagnation of air.

##### Access to water

- Very young should not be allowed to bathe
- A drinking fountain is provided.

##### Environmental Enrichment

- Contact with siblings or other similarly aged individuals.
- Shallow tray of water for feeding purposes.

#### 6.1.1 When to move to next stage

- Cygnets are moved from incubators when they are approximately 5 – 7 days old at around 200g.



Fig 2: Drinking fountain

**6.2 Indoor 2 (less intensive monitoring)**

CYGNETS:	INDEPENDENT, FULLY GROWN BIRDS (IMMATURES AND ADULTS):
<ul style="list-style-type: none"> <li>• Intensive care cubicle 1m x 1.2m</li> <li>• Birds may be put outside during the day providing they are monitored.</li> <li>• If the weather is inclement and no shelter is provided they are brought back into the intensive care pen.</li> <li>• Outside paddock 10m x 10m with a shallow pool 8m x 8m with a concrete surround. This area will need a net roof.</li> <li>• An outside covered shelter is provided (8m x 12m) outside the main enclosure and will be provided with power to allow heat lamps. [Where an outside shelter is provided (including heat lamps) birds may be left outside during most weather conditions.</li> </ul>	<ul style="list-style-type: none"> <li>• Different species will be kept separately.</li> <li>• Intensive care cubicle – 2 x 3m for up to 4 swans.</li> <li>• Ideally house adult swans individually except with mate.</li> <li>• Immature birds may benefit from being housed in pairs, but monitor for bullying.</li> </ul>

Table 2: Enclosure for swans before being moved outside

**Substrate**

- A non-slip substrate is essential in all areas.
- Camping mats covered by clean sheets or large towels or a scattering of wood shavings (high quality, dust extracted).
- Clean wood shavings to a depth of 50mm can be used in both indoor and out door enclosures.

**NOTES:**

- Where there is a healing wound that could be irritated by shavings, sheets over camping mats are recommended.
- Birds kept on shavings for long periods (over a month) without access to bathing water have not been found to have irreversible feather damage<sup>ii</sup>, however, bathing facilities will keep their plumage in good condition.

**Lighting**

- Natural daylight
- Normal room lighting

**Temperature**

- Heat lamps are provided for smaller birds or sickly individuals in outdoor shelters.
- Normal room temperature.

**Ventilation**

- Good ventilation is required at all times.

**Access to Water**

- Fresh drinking water must be available at all times

**Environmental Enrichment**

- Swimming should be available for those that want to and for those for whom it has been advised.
- To avoid bullying provide a number and range of shallow food and drinking trays.
- Access to grazing materials.

**6.2.1 When to move from Indoor 2 (cubicle) or indoor 3/outdoor**

- Birds may be placed outside when they reach 500 – 600gms but will still require access to shelter during inclement weather.



Fig 3: Swan in an isolation cubicle at Stapeley Grange. This design of cubicle is ideal for many species and is designed to be cleaned easily and can be modified to have access to an outside run, or with a deeper area that can be flooded to provide a pool.

### 6.3 Outdoor areas used for both primary and holding prior to release.

#### Enclosure

Decisions of whether a bird is fit for a move to an outside paddock/aviary should remain with a senior member of staff.

- Open paddock with access to pool facility.
- A net roof will prevent take off during strong or gusty winds and will also prevent swans and other birds entering the paddock.
- Ensure that swans do not create puddled or stale areas by rotating and resting paddocks.
- Concrete areas around pools reduce mud and debris entering the pools and help keep areas cleaner.
- The paddock should be primarily laid to grass.
- The grassed area must have good drainage.
- A concrete pool should be available with varying depths up to 1m.
- The pool should have a central drainage facility.
- Ensure birds can get off any pool.
- Depending on water supply, water should be changed daily. (At a minimum water should be changed every week.)

#### Substrate

- A range of good, environmentally enriching substrates is available but may create additional management problems. Examples include grass and gravel,
- Concrete and gravel substrates must be kept clean
- "Resting" natural substrates will give them time to recover.
- Where concrete bases are used they may be covered with camping mats or astroturf to provide a softer substrate. These are more easily kept clean but concrete is dull and may cause injury.

#### Shelter

- Shelter is generally unnecessary in the paddock area.

#### Access to Water

- Free access to bathing water and provision of fresh drinking water in shallow bowls.

#### Environmental Enrichment

- Company of other swans is an ideal.
- Grazing where available (summer)
- To avoid bullying provide many food and drinking trays.
- Provide food in trays (e.g. chopped grass, lettuce cabbage) in water or floating pond-weed spread on ponds

### 6.3.1 Indoor 3/outdoor to Outdoor (or directly to Release)

- Birds can be moved to permanent outdoor/deeper pool areas when they weigh upwards of around 1000 to 1200gms.

### 6.3.2 Outdoor enclosure to Release (or Release Pen)

Decisions of whether a bird is fit for release will remain with an experienced senior member of staff.

- All birds suitable for release must be clear of any veterinary treatment.
- The bird has been declared fit from a veterinary viewpoint.
- The bird's weight is good and sustained.
- All birds should be able to fly except that moulting birds may be released into established wild flocks.
- It has a suitable habitat to be released into.



Figs 4 & 5: Outside pools at Stapeley Grange where swans and other waterfowl are kept prior to release.

## 7 Food and Feeding

### 7.1 Food in the wild

**All species** (both adult and young) feed on a similar range of foods.

- The mute swan in all areas seems to prefer the leaves of submerged aquatic plants.
- Emergent plants will be taken as well as leaves (willow leaves are favoured), soaked grain, soft grasses, and saltmarsh plants (eg *Zostera sp.*).
- Although tadpoles, fish eggs and fry, small worms and crustaceans may be eaten this is done by accident as these small animals may be caught in the aquatic plants.
- Bewick's swans may take more small plant tubers than the other two species.
- Whooper swans may prefer a greater proportion of saltmarsh plants and also have a greater tendency to graze more than the other species.
- Whooper swans may also shuffle their feet underwater to loosen submerged plants.
- Cygnets hatch with a yolk sac on which they can survive for up to a week without feeding<sup>iii</sup>. This may have implications on any assisted feeding.

#### Young

- Feeding by mute swan cygnets is undertaken independently of the parents. However, the parents support and direct the young to suitable foods and bring food within reach.
- Food preference of the young is for small floating leaves, eg. water crowfoot<sup>2</sup> or duckweed<sup>3</sup>. Yellow and green coloured vegetation is preferred<sup>iv</sup>.

### 7.2 Captive diet

#### Adults

Basic ingredients for all species:

- 400gms mixed corn
- 200gms layers pellets
- or 80% corn/20% pellets
- Floating pellets if required (more expensive so use sparingly with inappetent birds)
- Greens *ad lib* (grass & other chopped greens e.g. lettuce, cabbage, spring greens)
- Top up as necessary
- Brown wholegrain bread
- Grit – provide a half dessert spoon per bird mixed with the standard diet when swans are kept inside.

For sickly or weak birds unable to feed for themselves:

- A mix of *Zoolyte* and soaked chick crumbs administered by crop tube 150ml twice/day
- OR
- AD diet and *Complan* in *Lectade* administered by crop tube 150ml twice/day

This is provided until the bird is eating for itself.

Some swans will begin to eat only when outside so it may be worth moving non-eating swans outside and monitoring them to see if they start feeding. These birds must be strong enough to cope outside and must have completed their isolation period,

#### Young

Cygnets up to 1.5 – 2kgs

- Finely chopped greens (chickweed (*Stellaria media*) grass & others eg. lettuce, cabbage, spring greens)
- Growers pellets<sup>4</sup> or layers mash<sup>5</sup>

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<sup>2</sup> Water crowfoot *Ranunculus aquatilis*

<sup>3</sup> Duckweed *Lemna sp.*

<sup>4</sup> **Growers pellets** contents: protein 15.5%, Ash 6.1%, fibre 4.5%, oil 4%, methionine 0.3%. Ingredients: 40% - 100% inclusion – wheat; 25% - 10% inclusion wheatfeed; 10% - 0% - Ext Hi-Pro soya from GM

- Grit

For sickly or weak birds unable to feed for themselves:

- A mix of *Zoolyte* and soaked chick crumbs administered by crop tube twice/day roughly 1/40<sup>th</sup> body weight.
  - OR
- AD diet and *Complan* in *Lectade* administered by crop tube roughly 1/40<sup>th</sup> body weight
- This is provided until the bird is eating for itself.

### 7.2.1 Frequency of feeding

#### Adults and young

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

### 7.2.2 Supplements

- Vitamin/mineral supplements (SA37) may be used where necessary.

### 7.2.3 Environmental Enrichment

- Provide food in a separate shallow bowl not in the pond. A clean, standard sized washing up bowl is most appropriate but make sure it is “non-tippable”.
- For young, ensure they cannot sit in their food. This prevents them getting food all over their down feathers.
- Water can be provided in shallow bowls so that it just covers a layer of small stones so that cygnets cannot drown<sup>v</sup>.



Fig 6: Typical swan diet provided in a 'washing up' type plastic bowl placed on a stand to keep it off the floor.

beans, confectionery products, maize germ meal, rapeseed meal, molasses; calcium carbonate; Di-cal phos; salt; Vit & min premix; Sodium bicarbonate; methionine.

<sup>5</sup> **Layers pellets** contents: Protein 16% Oil 3.6% Fibre 3.3% Ash 12% moisture 14%. Ingredients: 40 – 100% inclusion – wheat; 10 – 25% inclusion: wheatfeed; 0 – 10% soya; limestone, de-hulled Soya bean meal, maize, beans, barley, grass meal, mineral/vitamin supplement.

**7.3 Notes on feather development****7.3.1 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.

**7.3.2 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.

**7.3.3 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 Training the animal for survival

A good range of environmental enrichment provided through its time in care will benefit its release to the wild and its long-term survival.

### 8.2 When to release

- A morning release gives the bird/s time to find food, shelter and orientate themselves before dark.
- Windy days are best avoided, as birds (notably cygnets) need to establish themselves before flying off.
- Hand-reared cygnets are released from September onwards.

	♂♂	♀♀
Mute swan	7 – 12Kg (may reach 16Kg)	6 – 9.5 Kg
Whooper swan	8.5 – 10Kg	8.5 – 10Kg
Bewick's swan	4.9 – 7.8Kgs	3.4 – 7.2Kg

**NOTE:** Weight variations even in individuals can be quite significant. For example, mute swans can lose nearly 1kg during the 4-7 week moulting period and incubating females may lose up to 1/3<sup>rd</sup> of their weight while incubating the eggs.

Table 3: Weights of wild birds

### 8.3 Where to release

- Most mute swans rarely move far from their natal site – even when setting up their own territories.
- Adults should be returned to the site of finding providing it is suitable. Where sites are unsuitable they can be released into the nearest well - established flocks or known sites containing more than two adults.

### 8.4 How to release

- Cygnets can be released into well - established flocks or known sites.
- Where there are no established flocks, cygnets can be soft released in groups of five to six into monitored waters providing support feeding until they have moved off or any available vegetation is in good supply.

### 8.5 Information

- Weight and basic biometrics may prove to be useful data.

### 8.6 Tagging

- All temporary ID must be removed.
- All birds should be ringed with BTO rings.
- A Darvic ringing scheme is in place in certain areas of the country and RSPCA staff should take advantage of the scheme for improved recording.

## 9 Areas for research

- Further post release monitoring of hand-reared cygnets released onto Somerset levels.
- Look at fishing tackle to establish type of weight used and relate that to the reason for admission.
- Establish weights for birds at age 5 – 7 days in preparation for their move from the incubator.

## 10 Annexes

### 10.1 Glossary

♀; ♀♀	Female; females
♂; ♂♂	Male; males
<b>Biometrics</b>	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>Swan Manual</i> <sup>vi</sup> .
<b>BTO</b>	British Trust for Ornithology
<b>Cob</b>	The name given to a male swan
<b>Cygnets</b>	A young swan usually in its grey or fawn plumage
<b>Darvic ring</b>	A coloured plastic ring with letters that are visible from a distance and fitted to a bird's leg under special agreement with the Wildfowl & Wetland Trust.
<b>gms</b>	Grams
<b>ID</b>	Identification
<b>Kg</b>	Kilograms
<b>M</b>	Metres
<b>ml</b>	Millilitres
<b>mm</b>	Millimetres
<b>Pen</b>	The name given to a female swan
<b>Zostera</b>	An aquatic grass-like plant of estuaries. Eg. <i>Zostera marina</i> , eelgrass or common grass-wrack.

### 10.2 Products named in the text

<b>Astroturf</b>	A brand of artificial turf. Usually made from plastic and rubber with additional fibres for realism.
<b>Complan</b>	A whole-food dietary supplement – widely available. <i>Complanfoods Ltd., Imperial House, 15-19 Kingsway, London WC2B 6UN.</i>
<b>Lectade</b>	An oral rehydration preparation available either in liquid or powder forms. Available from most good pet stores.
<b>SA37</b>	A complete vitamin and mineral supplement. <i>Intervet UK Ltd, Walton Manor, Walton, Milton Keynes, MK7 7AJ.</i>
<b>Zoolyte</b>	A water soluble oral rehydration and probiotic supplement. <i>International Zoo Veterinary Group, Keighly, N Yorkshire, UK</i>

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<sup>iv</sup> Kear, J. 1964. Colour preference in young Anatidae. *Ibis* 106 (3) , 361–369

<sup>v</sup> Benyon P.H., Forbes N.A. & Harcourt-Brown N.H. 1996. BSAVA Manual of Raptors, Pigeons and Waterfowl. British Small Animal Veterinary Association Limited, Cheltenham, Gloucestershire.

<sup>vi</sup> Swan Study Group. 2005. Swan Manual. BTO, Thetford.