

# Husbandry Manual For **The Cape Barren Goose**

*Cereopsis novaehollandiae*

Latham 1801

(Aves: Anatidae)



**Compiled by** Lia Reeve-Parker

Date of Preparation: 2006-07

Western Sydney Institute of TAFE, Richmond

Captive Animal cert 111, no.1068

**Lecturers:** Graeme Phipps, Andrew Titmuss,  
Jacky Salkeld, Elissa Smith

# TABLE OF CONTENTS

|          |                                                         |           |
|----------|---------------------------------------------------------|-----------|
| <b>1</b> | <b><u>INTRODUCTION</u></b> .....                        | <b>7</b>  |
| <b>2</b> | <b><u>TAXONOMY</u></b> .....                            | <b>8</b>  |
| 2.1      | <u>NOMENCLATURE</u> .....                               | 8         |
| 2.2      | <u>SUBSPECIES</u> .....                                 | 8         |
| 2.3      | <u>RECENT SYNONYMS</u> .....                            | 9         |
| 2.4      | <u>OTHER COMMON NAMES</u> .....                         | 9         |
| <b>3</b> | <b><u>NATURAL HISTORY</u></b> .....                     | <b>10</b> |
| 3.1      | <u>MORPHOMETRICS</u> .....                              | 11        |
| 3.1.1    | <u>Mass And Basic Body Measurements</u> .....           | 11        |
| 3.1.2    | <u>Sexual Dimorphism</u> .....                          | 11        |
| 3.1.3    | <u>Distinguishing Features</u> .....                    | 11        |
| 3.2      | <u>DISTRIBUTION AND HABITAT</u> .....                   | 12        |
| 3.3      | <u>CONSERVATION STATUS</u> .....                        | 14        |
| 3.4      | <u>LONGEVITY</u> .....                                  | 15        |
| 3.4.1    | <u>In the Wild</u> .....                                | 15        |
| 3.4.2    | <u>In Captivity</u> .....                               | 15        |
| 3.4.3    | <u>Techniques Used to Determine Age in Adults</u> ..... | 15        |
| <b>4</b> | <b><u>HOUSING REQUIREMENTS</u></b> .....                | <b>16</b> |
| 4.1      | <u>EXHIBIT/ENCLOSURE DESIGN</u> .....                   | 16        |
| 4.2      | <u>HOLDING AREA DESIGN</u> .....                        | 16        |
| 4.3      | <u>SPATIAL REQUIREMENTS</u> .....                       | 17        |
| 4.4      | <u>POSITION OF ENCLOSURES</u> .....                     | 17        |
| 4.5      | <u>WEATHER PROTECTION</u> .....                         | 17        |
| 4.6      | <u>TEMPERATURE REQUIREMENTS</u> .....                   | 17        |
| 4.7      | <u>SUBSTRATE</u> .....                                  | 18        |
| 4.8      | <u>NESTBOXES AND/OR BEDDING MATERIAL</u> .....          | 18        |
| 4.9      | <u>ENCLOSURE FURNISHINGS</u> .....                      | 19        |
| <b>5</b> | <b><u>GENERAL HUSBANDRY</u></b> .....                   | <b>21</b> |
| 5.1      | <u>HYGIENE AND CLEANING</u> .....                       | 21        |
| 5.2      | <u>RECORD KEEPING</u> .....                             | 22        |
| 5.3      | <u>METHODS OF IDENTIFICATION</u> .....                  | 23        |
| 5.4      | <u>ROUTINE DATA COLLECTION</u> .....                    | 23        |
| <b>6</b> | <b><u>FEEDING REQUIREMENTS</u></b> .....                | <b>24</b> |
| 6.1      | <u>DIET IN THE WILD</u> .....                           | 24        |
| 6.2      | <u>CAPTIVE DIET</u> .....                               | 25        |
| 6.3      | <u>SUPPLEMENTS</u> .....                                | 28        |
| 6.4      | <u>PRESENTATION OF FOOD</u> .....                       | 29        |
| <b>7</b> | <b><u>HANDLING AND TRANSPORT</u></b> .....              | <b>30</b> |
| 7.1      | <u>TIMING OF CAPTURE AND HANDLING</u> .....             | 30        |
| 7.2      | <u>CATCHING BAGS</u> .....                              | 30        |
| 7.3      | <u>CAPTURE AND RESTRAINT TECHNIQUES</u> .....           | 30        |
| 7.4      | <u>WEIGHING AND EXAMINATION</u> .....                   | 31        |
| 7.5      | <u>RELEASE</u> .....                                    | 32        |
| 7.6      | <u>TRANSPORT REQUIREMENTS</u> .....                     | 33        |
| 7.6.1    | <u>Box Design</u> .....                                 | 33        |
| 7.6.2    | <u>Furnishings</u> .....                                | 34        |
| 7.6.3    | <u>Water and Food</u> .....                             | 34        |
| 7.6.4    | <u>Animals per Box</u> .....                            | 34        |

|           |                                                       |           |
|-----------|-------------------------------------------------------|-----------|
| 7.6.5     | <u>Timing of Transportation</u> .....                 | 34        |
| 7.6.6     | <u>Release from Box</u> .....                         | 34        |
| <b>8</b>  | <b><u>HEALTH REQUIREMENTS</u></b> .....               | <b>35</b> |
| 8.1       | <u>DAILY HEALTH CHECKS</u> .....                      | 35        |
| 8.2       | <u>DETAILED PHYSICAL EXAMINATION</u> .....            | 35        |
| 8.2.1     | <u>Chemical Restraint</u> .....                       | 36        |
| 8.2.2     | <u>Physical Examination</u> .....                     | 37        |
| 8.3       | <u>ROUTINE TREATMENTS</u> .....                       | 38        |
| 8.4       | <u>KNOWN HEALTH PROBLEMS</u> .....                    | 39        |
| 8.5       | <u>QUARANTINE REQUIREMENTS</u> .....                  | 41        |
| <b>9</b>  | <b><u>BEHAVIOUR</u></b> .....                         | <b>43</b> |
| 9.1       | <u>ACTIVITY</u> .....                                 | 43        |
| 9.2       | <u>SOCIAL BEHAVIOUR</u> .....                         | 43        |
| 9.3       | <u>REPRODUCTIVE BEHAVIOUR</u> .....                   | 44        |
| 9.4       | <u>BATHING</u> .....                                  | 45        |
| 9.5       | <u>BEHAVIOURAL PROBLEMS</u> .....                     | 45        |
| 9.6       | <u>SIGNS OF STRESS</u> .....                          | 45        |
| 9.7       | <u>BEHAVIOURAL ENRICHMENT</u> .....                   | 46        |
| 9.8       | <u>INTRODUCTIONS AND REMOVALS</u> .....               | 46        |
| 9.9       | <u>INTRASPECIFIC COMPATIBILITY</u> .....              | 47        |
| 9.10      | <u>INTERSPECIFIC COMPATIBILITY</u> .....              | 47        |
| 9.11      | <u>SUITABILITY TO CAPTIVITY</u> .....                 | 47        |
| <b>10</b> | <b><u>BREEDING</u></b> .....                          | <b>48</b> |
| 10.1      | <u>MATING SYSTEM</u> .....                            | 48        |
| 10.2      | <u>EASE OF BREEDING</u> .....                         | 48        |
| 10.3      | <u>REPRODUCTIVE CONDITION</u> .....                   | 48        |
| 10.3.1    | <u>Females</u> .....                                  | 48        |
| 10.3.2    | <u>Males</u> .....                                    | 48        |
| 10.4      | <u>TECHNIQUES USED TO CONTROL BREEDING</u> .....      | 48        |
| 10.5      | <u>OCCURRENCE OF HYBRIDS</u> .....                    | 48        |
| 10.6      | <u>TIMING OF BREEDING</u> .....                       | 48        |
| 10.7      | <u>AGE AT FIRST BREEDING AND LAST BREEDING</u> .....  | 48        |
| 10.8      | <u>ABILITY TO BREED EVERY YEAR</u> .....              | 48        |
| 10.9      | <u>ABILITY TO BREED MORE THAN ONCE PER YEAR</u> ..... | 49        |
| 10.10     | <u>NESTING, HOLLOW OR OTHER REQUIREMENTS</u> .....    | 49        |
| 10.11     | <u>BREEDING DIET</u> .....                            | 49        |
| 10.12     | <u>INCUBATION PERIOD</u> .....                        | 49        |
| 10.13     | <u>CLUTCH SIZE</u> .....                              | 49        |
| 10.14     | <u>AGE AT FLEDGING</u> .....                          | 49        |
| 10.15     | <u>AGE OF REMOVAL FROM PARENTS</u> .....              | 49        |
| 10.16     | <u>GROWTH AND DEVELOPMENT</u> .....                   | 50        |
| <b>11</b> | <b><u>ARTIFICIAL REARING</u></b> .....                | <b>51</b> |
| 11.1      | <u>INCUBATOR TYPE</u> .....                           | 51        |
| 11.2      | <u>INCUBATION TEMPERATURES AND HUMIDITY</u> .....     | 51        |
| 11.3      | <u>DESIRED % EGG MASS LOSS</u> .....                  | 51        |
| 11.4      | <u>HATCHING TEMPERATURE AND HUMIDITY</u> .....        | 52        |
| 11.5      | <u>NORMAL PIP TO HATCH INTERVAL</u> .....             | 52        |
| 11.6      | <u>BROODER TYPES/DESIGN</u> .....                     | 52        |
| 11.7      | <u>BROODER TEMPERATURES</u> .....                     | 52        |
| 11.8      | <u>DIET AND FEEDING ROUTINE</u> .....                 | 53        |

|              |                                             |           |
|--------------|---------------------------------------------|-----------|
| <u>11.9</u>  | <u>SPECIFIC REQUIREMENTS</u> .....          | 53        |
| <u>11.10</u> | <u>PINIONING REQUIREMENTS</u> .....         | 53        |
| <u>11.11</u> | <u>DATA RECORDING</u> .....                 | 54        |
| <u>11.12</u> | <u>IDENTIFICATION METHODS</u> .....         | 54        |
| <u>11.13</u> | <u>HYGIENE</u> .....                        | 54        |
| <u>11.14</u> | <u>BEHAVIOURAL CONSIDERATIONS</u> .....     | 54        |
| <u>11.15</u> | <u>USE OF FOSTER SPECIES</u> .....          | 55        |
| <u>11.16</u> | <u>WEANING</u> .....                        | 55        |
| <u>11.17</u> | <u>REHABILITATION PROCEDURES</u> .....      | 55        |
| <b>12</b>    | <b><u>ACKNOWLEDGEMENTS</u></b> .....        | <b>56</b> |
| <b>13</b>    | <b><u>REFERENCES</u></b> .....              | <b>58</b> |
| <b>14</b>    | <b><u>BIBLIOGRAPHY</u></b> .....            | <b>64</b> |
| <b>15</b>    | <b><u>GLOSSARY</u></b> .....                | <b>69</b> |
| 16           | <u>Appendix</u> .....                       | 71        |
| (1)          | Annual Cycle of Maintenance.....            | 71        |
| (2)          | Airway bill.....                            | 72        |
| (3)          | Notice to captain.....                      | 73        |
| (4)          | Import Export permit example.....           | 74        |
| (5)          | Shippers Certificate.....                   | 76        |
| (6)          | Known Health Problems– Endemic.....         | 77        |
| (7)          | Known Health Problems– some exotics.....    | 87        |
| (8)          | Chemical Restraint in Birds.....            | 88        |
| (9)          | Obtaining an Import and Export licence..... | 89        |
| (10)         | Rehabilitation Procedures.....              | 91        |
| (11)         | Local Pet suppliers– Pet Barn.....          | 93        |

**Compiler– Lia Reeve-Parker**  
**Contacting Lia; lambpie8@hotmail.com**

## Associated OH&S Risks

Exhibiting a Cape Barren Goose (*Cereopsis novaehollandiae*) falls under the **low risk category** (innocuous). However during the breeding season (early spring) the goose will become very aggressive towards anything that threatens its breeding territory, even humans. In the event of an attack, the Cape Barren Goose will use its beak and wings, often grasping clothing with its beak and bashing its wings into any body part it can reach. An attack such as this may cause bruising and possibly break the skin or draw blood. To minimise this risk, the enclosure should be built in a way so that keepers can safely feed and clean, while the Geese also feel that their nests are secure (see Housing Requirements 4.1) In the case of an aggressive goose PPE (personal protective equipment) should be utilised in the form of protective clothing, such as gloves and gumboots.

**Zoonotic diseases** could also pose a risk (see table below for relevant diseases). Minimising this risk requires following correct Quarantine procedures: uphold a clean living environment for the species to reduce the spread of disease; always wear correct PPE clothing and face masks when cleaning; and, always wash hands.

| Zoonotic Diseases                                            | Pathogen                                           | Epidemiology                                                            | Effects                                                                      | Treatments                                                                                      |
|--------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Anthrax</b><br><i>Bacillus anthracis</i>                  | A spore forming bacterium                          | Inhalation and ingestion of spores from contaminated goose              | Black skin lesions, hemorrhaging, sudden death                               | Antibiotics such as amoxicillin, doxycycline and enrofloxacin                                   |
| <b>Aspergillus</b>                                           | <i>Aspergillus Flavus</i><br>A fungus              | Inhalation, through conjunctiva, contaminated food, areas and equipment | Decreased feed intake, gasping and laboured breathing in chicks<br>Diarrhoea | Not recommended, remove source, good husbandry, spray with 1% copper sulfate to remove fungi    |
| <b>Avian Tuberculosis</b>                                    | Mycobacterium Avium or genavense                   | When the mycobacterium over-contaminates the soil                       | Wasting lameness, Diarrhea, depression                                       | Experimental drug regimes, good husbandry (disinfecting etc) cull                               |
| <b>Avian Influenza (has the potential to become endemic)</b> | Virus                                              | Spread by direct contact, manure, clothes and equipment                 | Swelling of the head, nasal discharge, coughing, sneezing, Diarrhea, death.  | Fatal, inform authorities to prevent the spread of this disease in Australia.                   |
| <b>Botulism</b>                                              | <i>Clostridium Botulinum</i><br>Produces a toxin   | Ingestion of food or water contaminated by the toxin produced.          | Drowsiness weakness, difficulty walking, paralysis of wings neck and legs    | Provide shade, fresh water and a secure environment, in severe cases use the specific antitoxin |
| <b>Coccidiosis</b>                                           | Numerous species protozoan intracellular parasites | Ingestion of a sporulated oocyst                                        | Lethargy, weight loss, dehydration, diarrhea, death                          | Anti-coccidial drugs like coccivet toltril & trimisul                                           |

| Zoonotic diseases continued                                                            | Pathogen                                       | Epidemiology                                                                                                     | Effects                                                                                                          | Treatment                                                                                                                          |
|----------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Murray Valley encephalitis (zoonotic)</b>                                           | genus Flavivirus                               | Mosquitoes feed on birds effected by the virus then spread it to other birds, animals and humans                 | Weight loss, decreased activity, depression, dehydration, hemorrhaging, pale lungs, possible death               | Notification of authorities, not affective treatment or vaccine, IV fluids, respiratory assistance.                                |
| <b>Newcastle Disease (exotic though there have been 6 outbreaks in Aus since 1998)</b> | A virus from the paramyxovirus group           | Excreted from the respiratory tract and in the faeces air bourn, humans, contaminated vaccines and equipment     | Depression, no appetite, diarrhea, swelling of the head, increased respiration, nasal or eye discharge, coughing | Broad spectrum antibiotics yet nothing is truly effective                                                                          |
| <b>Avian pseudotuberculosis</b>                                                        | <i>Yersinia pseudotuberculosis</i> (bacterial) | Skin penetration, ingestion                                                                                      | Acute septicemia, diarrhea, emaciation, drowsiness, anorexia, ruffled feathers                                   | Chlortetracycline via drinking water or feed for 3 weeks                                                                           |
| <b>psittacosis (chlamydiosis)</b>                                                      | <i>Chlamydia psittaci</i>                      | Infected droppings, dust, fluff, bird carcasses                                                                  | Trembling, unbalanced gait, greenish diarrhea, dehydration, eye and nasal discharge                              | Broad spectrum antibiotics, particularly tetracyclines                                                                             |
| <b>Avian Salmonellosis (zoonotic)</b>                                                  | <i>Salmonella</i> spp                          | It is always in the environment, when birds are too concentrated or stressed it infects them and spreads rapidly | lesions may occur in skeletal muscle, heart, other tissues                                                       | No known treatment, is likely to be fatal. Prevent by having raised feeders. Disinfect regularly and remove seed husks from ground |
| <b>Toxoplasmosis (Zoonotic) (protozoan)</b>                                            | <i>Toxoplasma gondii</i>                       | Felids are the definitive host, shedding the protozoa in their faeces, it is consumed by warm blooded animals    | No signs in adult, still births and signs in juveniles include fever, diarrhea coughing, death                   | For animals other than humans, treatment is seldom warranted, sulfadiazine and pyrimethamine, but will not eradicate infection     |

-The Importation Of Non-Viable Eggs And Products

-Avian Chlamydiosis (Psittacosis)

-Avian Tuberculosis

-Highly Pathogenic Avian Influenza

-Birds 2000

-A manual of Poultry Diseases

-FAO goose production France

-West Nile Virus

-Agents associated with disease in waterfowl

-The Poultry Site Disease Guide

-Victorian government health information

-Animal Health Australia

# 1 Introduction

Captive management of all animals is a vital conservation tool in helping to prevent the extinction of many of the world's fauna. Cooperation between individuals and institutions in nations around the world, is the first step in conserving our animals and animal habitat.

In the past, the Cape Barren Goose numbers were drastically reduced for many reasons, primarily a result of human involvement. Still the *Grisea* subspecies is one of the rarest Geese in the world. Although at present, numbers are stable, there is still very little documentation on how to care for them in captivity. Accordingly, this management manual has been compiled on one of Australia's forgotten treasures, namely the Cape Barren Goose.

The Cape Barren Goose is very suitable for captivity. It breeds well, providing opportunities for research within our zoos. It is unique in many ways; so much so that it has been classified individually with a tribe named after it (*ceropsini*). Debate continues as to whether it is a goose at all. It shares attributes with the goose but also lacks many. It is commonly named the Cape Barren Goose, yet when given its scientific name the 'goose' was left out and it was named *Cereopsis novaehollandiae* for the 'Australian with an interesting cere'.

Although this manual provides substantive management procedures relating to the Cape Barren Goose, it is still apparent that research must continue so that this bird is better understood and cared for in captivity in the future. It is hoped that effective use of this manual will provide some answers to those who seek it.

**Compiler–** Lia Reeve-Parker  
**Contacting Lia;** [lambpie8@hotmail.com](mailto:lambpie8@hotmail.com)

## 2 Taxonomy

### 2.1 Nomenclature

**Kingdom;** Animalia

**Phylum;** Chordata

Sub-phylum; Vertebrate

**Class;** Aves

**Order;** Anseriformes

**Family;** Anatidae

Sub-family; Anserinae (subject to controversy)\*

**Genus;** *Cereopsis* Latham 1801

**Species;** *novaehollandiae*

-[Wikipedia](#)

\*The Cape Barren Goose is mostly classified under the sub family Anserinae (for Geese and swans) in a tribe all of its own called Cereopsis or Cereopsini. However, it sometimes gets transferred to Tadorninae (an intermediate between Geese and ducks) in the tribe Tadornini.

### 2.2 Subspecies

*Cereopsis novaehollandiae grisea*

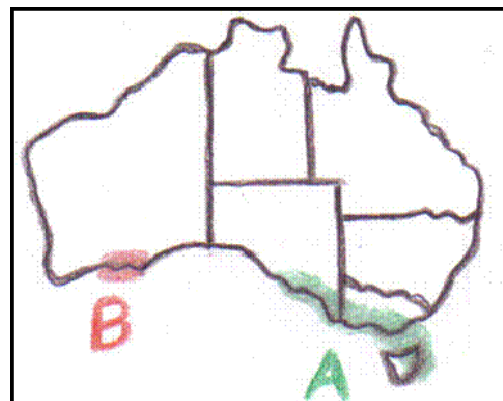
Cape Barren Goose (south-western), Recherche Cape Barren Goose

|                            |                                                          |
|----------------------------|----------------------------------------------------------|
| <b>EPBC Act Status</b>     | <b>Listed as Vulnerable</b>                              |
| <b>Scientific name</b>     | <i>Cereopsis novaehollandiae grisea</i>                  |
| <b>Family</b>              | Anatidae:Anseriformes:Aves:Chordata:Animalia             |
| <b>Infraspecies author</b> | Vieillot, 1818, Bennett, 1831, Mathews, 1912, Storr,1980 |

- [Department for Environment and heritage Species profile and threats](#)

### Subspecies cont.

The Recherche Cape Barren is only found in Western Australia or on its islands. The population is mainly centred on the Archipelago of the Recherche, hence where it received its name. Current estimates are that there are no more than 1000 of the South Western Cape Barrens alive today, making this one of the rarest Geese in the world. See map to the right for approximate distribution or section 2.2 for accurate distribution.

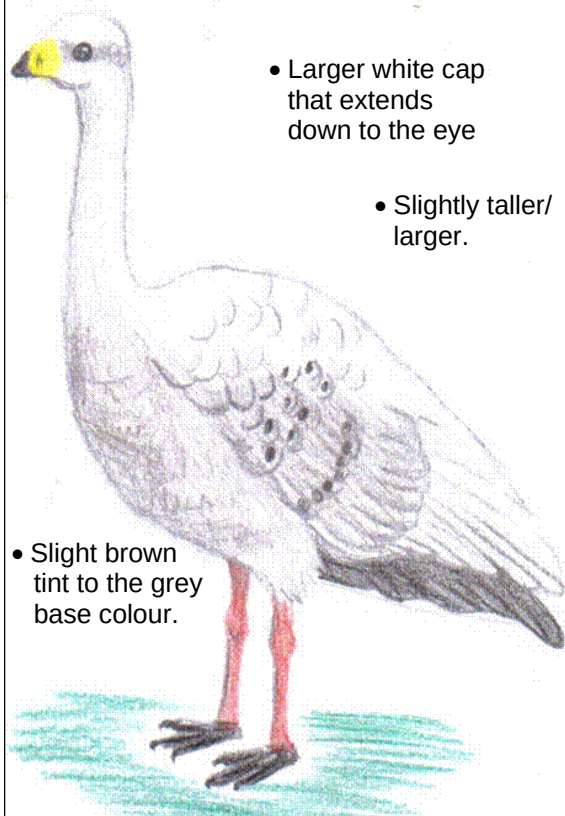


-[Simpson and Day field guide](#)

A= Race *novaehollandiae*  
B= Race *grisea*



**Cereopsis novaehollandiae grisea**



- Larger white cap that extends down to the eye
- Slightly taller/larger.

- Slight brown tint to the grey base colour.

**Cereopsis novaehollandiae novaehollandiae**



- White crown not quite down to the eye.
- Ashy blue-grey plumage.
- Slightly shorter in height.

Lia '07'

-Michael Morcombe Field Guide

*Cereopsis novaehollandiae novaehollandiae*, is the other sub– species and the one this manual is focused on. (Seen as 'A' on the map on previous page.)

### **2.3 Recent Synonyms**

None Found

### **2.4 Other Common Names**

The Cereopsis Goose

The pig goose

### 3 Natural History

The Cape Barren Goose is only native to Australia and its islands, its not found any where else in the world and is unique because of this. It is considered one of the rarest Geese of the world. Its name originates from being first spotted on Cape Barren Island, which is one of the Furneaux group of islands off the north east coast of Tasmania.

The Cape Barren Goose nests only on small, windswept and generally uninhabited offshore islands, on the ground in colonies. During the non-breeding season (summer) they fly between the islands and the Tasmanian and mainland coasts of southern Australia in search of farmland to graze on. Their ability to drink salt or brackish water allows them to remain on offshore islands all year round. (The subspecies of western Australia are known to do this.)

Early accounts suggest that by the turn of the twentieth century, sealers and settlers had hunted this species almost to extinction. Consequent protection by wildlife agencies and the birds' adaptation to feeding on agricultural land has increased numbers currently to 16-20,000 on the mainland, and 14000 in Tasmania. These numbers may approximate their population before European settlement.

During summer they are gregarious, and migrate to the mainland in flocks of sometimes up to 70 birds. It has been recorded that one Cape Barren moved a distance of a staggering 800km. During breeding time, they split into pairs (being a monogamous bird) and nest in the undergrowth and grasslands of the predator-free islands.

### 3.1 Morphometrics

#### 3.1.1 Mass And Basic Body Measurements

Height; 85 cm average

Length (bill to tail); 75-100 cm average 85cm (4.5 ft) females smaller

Wingspan; 1.7metres (5.5 ft)

Wing folded; 45-90 cm females smaller

Tarsus; 10-11cm

Bill including cere; 48-53mm

Weight; Males 5.29kg females smaller

#### 3.1.2 Sexual Dimorphism

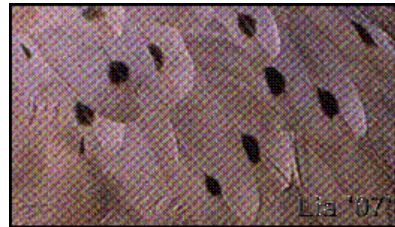
The male weighs on average 5.29 kg and the female 3.77 kg. There is little information recorded on the measurements of the females

-Favorite Australian Birds

-Ducks Geese and Swans of the World

#### 3.1.3 Distinguishing Features

The goose's plumage is pale grey with black markings near the tips of its wing feathers and tail



It has a bright greenish-yellow cere (the area around



the nostrils at the base of the bill) on its short black bill, which is unique.



It has pink or red legs and black feet.

A white stripe starts at the cere and extends to the back of the head, this stripe extends down to the eye in the western Australian sub-species.



It has red eyes.

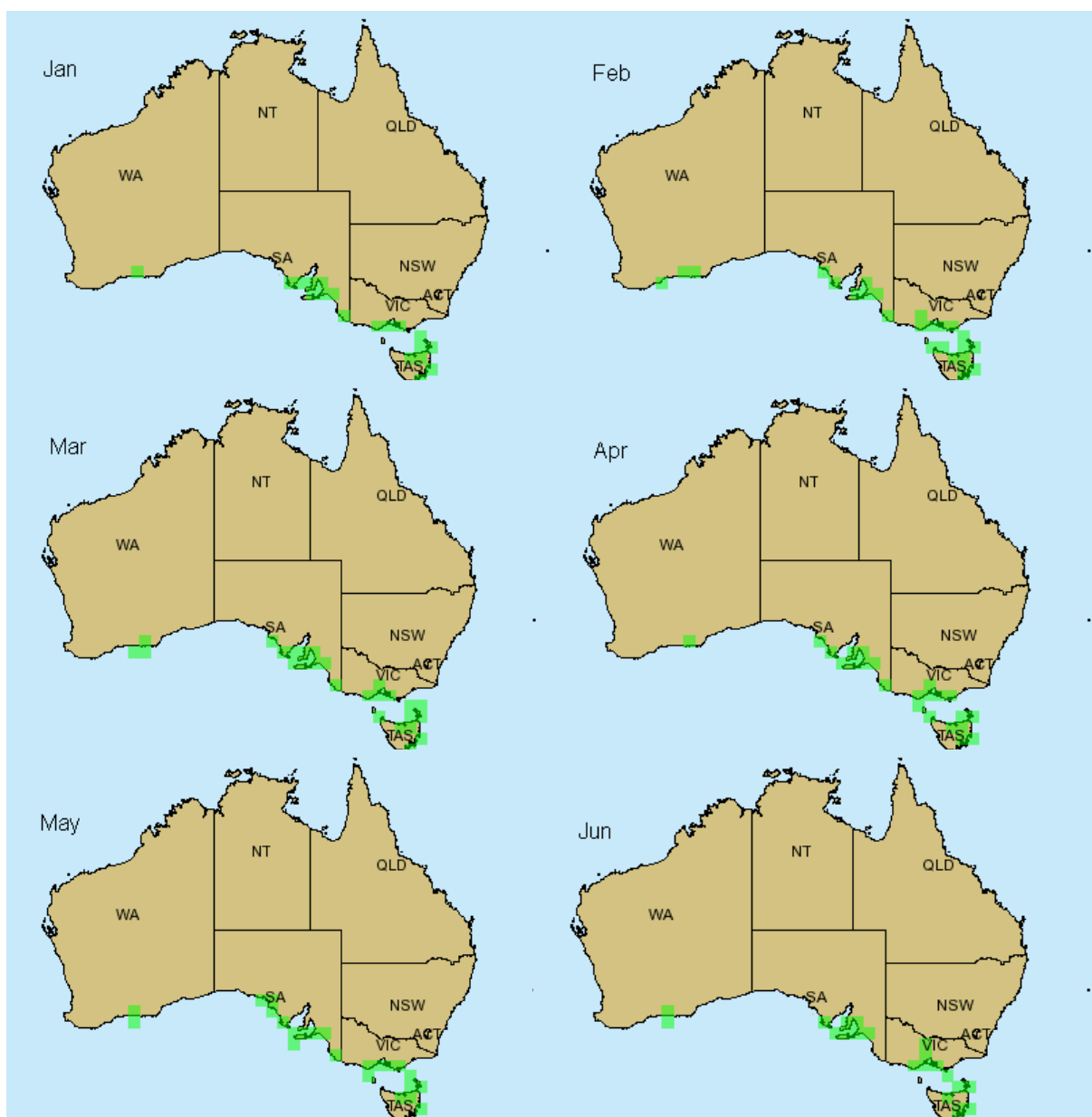
### 3.2 Distribution and Habitat

The Cape Barren Goose is only found in southern Australia, on the mainland from Cape Leeuwin to bass straight and cape port land in Tasmania. The Geese are also spread over many islands in this region; Kangaroo island, Cape Barren Island (where they were first discovered), Sir Josheph Banks Islands, Victorian coastal islands of Wilson's Promontory, the Bass Straight islands including the Hogen, Kent, Curtis and Furneaux groups. They are also found on the hunter group of islands off northwest Tasmania and were introduced to Maria Island off Tasmania's south east coast.

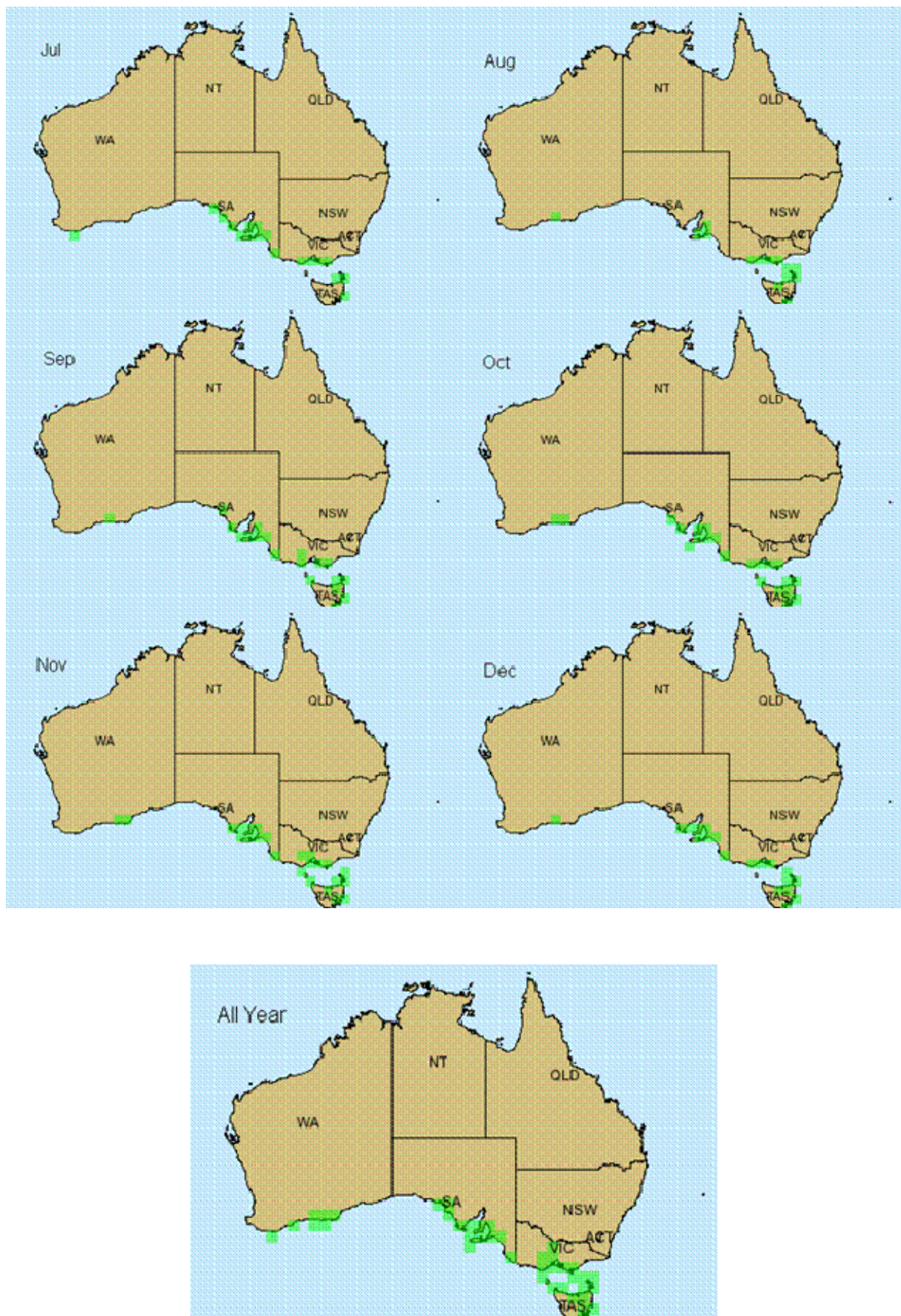
The Geese fly to the many tiny islands of the Bass Straight and surrounds to breed in autumn. These islands are a rocky habitat with tussock grass and sometimes no fresh drinking water, hence the Goose's ability to excrete salt water through their beak.

In spring when the islands start to dry out, there is not enough food to support all the Cape Barrens so most fly in small or large flocks to the mainland. This habitat is one of rich green farming pastures where food is plentiful for the Geese.

The maps below provide a month by month distribution of the Cape Barrens, showing their approximate movements throughout the year;







-Birddata: By Birds Australia and Wildlifelink

### 3.3 Conservation Status

The current Cape Barren Goose population is the healthiest it has been since the twentieth century. This is due in part to the plentiful food supply in the form of edible pastures produced by farmers on the mainland, and to the diminished desire of their primary predator (humans) to cull them.

-Au. Gov. Department of the Environment and Heritage, EPBC act status

|                        |                                              |
|------------------------|----------------------------------------------|
| <b>EPBC Act Status</b> | <a href="#">Marine</a>                       |
| <b>Scientific name</b> | <i>Cereopsis novaehollandiae</i> [981]       |
| <b>Family</b>          | Anatidae:Anseriformes:Aves:Chordata:Animalia |
| <b>Species Author</b>  | Latham,1801                                  |

Because the Cape Barren Goose falls under 'marine' this means the EPBC Act promotes conservation of biodiversity by providing strong protection for them.

The Cape Barren Goose is not in the red in the World Conservation Unions; Red list of threatened species as it is not endangered. (below)

| IUCN Redlist Categories |           |           |           |           |                   |                   |                   |
|-------------------------|-----------|-----------|-----------|-----------|-------------------|-------------------|-------------------|
| <b>EX</b>               | <b>EW</b> | <b>CR</b> | <b>EN</b> | <b>VU</b> | <b>LR/<br/>cd</b> | <b>LR/<br/>nt</b> | <b>LR/<br/>lc</b> |
|                         |           |           |           |           |                   |                   | <b>CBG</b>        |

-IUCN Red List of Threatened Species

#### KEY

EX– Extinct,

EW-Extinct in the wild,

CR- Critically endangered,

EN– Endangered,

VU– Vulnerable,

LR/cd– Low Risk/Conservation Dependant,

LR/nt– Low Risk/near threatened,

LR/lc– Low Risk/ Least Concern

CBG– Cape Barren Goose

### 3.4 Longevity

#### 3.4.1 In the Wild

The ABBBS (Australasian Bird and Bat Banding Scheme) have banded Cape Barren Geese. The maximum elapsed time in between recapturing one of the Geese was: 18 years 0.5 month. Depending on the Goose's original age and how long it lived after recapture, this is an estimation of the max longevity in the wild. -ABBBS

Banding done by the DPI recovered that the average lifespan in the wild is 6-8 years. Half the Geese are lost in the first 12 months and the max longevity in the wild for their banded Geese is 15 years. -Greg Hocking DPI

#### 3.4.2 In Captivity

15-20 years average. Max 28.1 years

-Longevity Records

#### 3.4.3 Techniques Used to Determine Age in Adults

There is nothing documented on how to tell the age of an adult Cape Barren Goose. The best solution for this is good record keeping. It is possible however, to tell the difference between an adult and a Juvenile;

| Differences between Adults And Juveniles |                                            |
|------------------------------------------|--------------------------------------------|
| ADULTS                                   | JUVENILES                                  |
| Heavier                                  | Average slightly lighter                   |
| Bright greenish yellow cere              | Pale yellowish grey cere                   |
| Bright reddish pink legs                 | Legs vary from black- light charcoal/green |
| Lighter black spotting on the wings      | Heavier spotting on the wings              |
| Eye is Red                               | Eye is Black                               |
| Feet are black                           | Feet are grey                              |

-Ducks Geese and Swans of the world





## 4 Housing Requirements

### 4.1 Exhibit/Enclosure Design

When designing / constructing the Cape Barren Goose exhibit, the following EAPA guidelines should be followed. The enclosure should be constructed so that:

- The entry of predators, pests and wild Geese of the same species is minimised.
- The visiting public are safe (the Geese are territorial in the breeding season)
- The Geese cannot escape.
- Injury to the Geese in the enclosure is minimised.
- The gates or doors minimise the escape of the goose (opening inwards if hinged).
- Sufficient shelter is provided to allow protection from the elements.
- Sufficient drainage is provided to take any excess water away from the exhibit in heavy rain (pic below right).
- Feeding watering points are able to be easily moved or the substrate surrounding be easily changed (pic below left).

-Exhibited Animals Protection Act

- In addition to above: sharp corners, projections and materials which may be harmful to the Geese are avoided.
- It provides protection from predators and adverse weather conditions, and, as far as possible, from rodents and wild birds.
- It allows for easy maintenance of good conditions of hygiene, air and water quality.
- It allows a thorough inspection of all birds.
- It facilitates management of the birds.
- Effective capture of the Geese must be possible (a holding area for example).

-Standing comity for the European convention of the protection of animals



### 4.2 Holding Area Design

The holding area should be designed so the Geese can:

- Freely stand up, stretch and turn around.
- The length is at least 3 times the goose's length and the breadth is at least 1.5 times the length.
- It has adequate protection from the weather.
- It allows safe access for the keepers and does not include blind spots.

-Exhibited Animals Protection Act



### **4.3 Spatial Requirements**

- The size and shape of the enclosure must provide freedom of movement both vertically and horizontally.
- The Geese must be able to avoid undue conflict with each other or other species if in an interspecies aviary.
- They must also have sufficient space to be able to withdraw from contact with humans and each other.
- Have enough space to permit exercise and behavioral enrichment.

-Exhibit Animals Protection Act

### **4.4 Position of Enclosures**

The aviary should face northeast where it is possible to trap the warmth of the sun and avoid the cold southwesterly winds. This aspect will also give protection from the westerly sun.

-Code of practice for the welfare of captive birds

\*Note; this is entirely dependant on the location of the zoo, the Cape Barren Goose is a cold climate bird which possibly could not do so well being in a zoo in the northern territory while facing full sun. Location needs to be taken into account.

### **4.5 Weather Protection**

- A section about 1/3 the length of the aviary should be fully covered and enclosed on three sides.
- If your Geese are free range there should be a shelter closed in on three sides, constructed somewhere in the vicinity that you usually find them each day. So in the event of bad weather they have protection if they choose to use it.
- All shelters need to provide sufficient protection from wind, rain and extremes in temperature, and allow sufficient access to shade in the hot periods in the day.

-Code of practice for the welfare of captive birds

-Exhibited Animals Protection Act



**Free range or non-aviary shelter**

### **4.6 Temperature Requirements**

The enclosure should not need any internal heating. The Cape Barren Goose lives in a mostly cold climate in winter. The night temperature can fall to below zero. In summer the daytime temp is 14-25 °C on average but there can be heat waves of 35-40°C. Birds are endothermic therefore can survive this temperature range, however care should be taken in areas of constant high temperatures, monitor birds for heat stress. Provide air conditioning if needed.

#### 4.7 Substrate

- Grass lawn is ideal as the Geese will eat it. However in a small aviary they may eat it bare so other substrates should be used.
- Bark chip is effective though hard to clean because the whole substrate needs to be replaced.
- The use of sand or river sand in parts is effective as it is easy to clean, resembles part of the Goose's natural environment, and is good to use under the feed area.
- Rocks and gravel are easy to hose clean and are long lasting. However there will be build up of waste underneath them which could harbor diseases, also they are difficult to change and possibly hard on the feet of the Geese.
- Leaf litter is helpful for when they build a nest.

Grass lawn



Bark chip



River sand in parts



#### 4.8 Nest boxes and/or Bedding Material

- Nest boxes could be trialed but given the size of the Goose they should be constructed more like a kennel, and they are not guaranteed to use it.
- Alternatively, shrubs and tall tussock grass should be thick in a covered area of the aviary, giving the Geese a chance to build a natural nest with visual barriers as they do in the wild.
- In autumn (the nest building time) objects such as sticks, reeds, cut grass, straw, or hay could be offered into the enclosure as possible nesting material.

Nest building material



Ideas for nest box





Large rocks

## 4.9 Enclosure Furnishings

### Natural furniture

- Tussock grass resembles their natural environment and they can also eat it.
- A pond can resemble their natural habitat. Although they are capable swimmers they are unlikely to use it for swimming.
- Rocks, small and large can be used.
- Sticks, reeds, grass cuttings and other natural leaf litter assist them in building their nest
- Small shrubs can be used as a visual barrier in parts so the Geese feel their nest is partly protected. A large or hollow log could also work in this way.



Pond



Hollow Log



Native Tussock Grass



Large Log



### Behavioral enrichment furniture

- Manipulable objects that can be moved and investigated e.g. sea shells, durable plastic and rubber sea creatures such as octopus and sea stars.
  - Kong toy usually used for dogs, filled with lettuce or the favourite leafy greens (in after hour time).
  - Plastic bottles with coloured confetti sealed inside (after hours).
  - Ice piled on the walkways or dumped in large quantities into the pool; other objects can be buried in the ice so the Geese can dig through it.
- Bird Enrichment Taking Flight
- The provision of a variety of substrates will enrich the Geese by allowing them to wander through a number of their natural habitats.
  - Olfactory- the placing of an object that smells strongly of a predator, other natural smells, buried herbs or scented oils.
  - A sprinkler system set up to lightly mist in summer for the Geese to bath or preen in.



## 5 General Husbandry

### 5.1 Hygiene and Cleaning

#### **Disinfecting the enclosure;**

It is important to understand that no disinfection program can replace proper aviary design; which includes quarantine facilities for new birds, prevention of cross contamination between cages, and wholesome food and water sources. Disinfectants are not intended to replace routine cleaning.

The best time to use a disinfectant is in cleaning fomites. Good examples include hands, clothes, shoes, food and water bowls, food processing surfaces, feeding syringes and the like.

Before a disinfectant is used, washing with soap and water is required. In fact, you can expect to remove 95% of all microbes through adequate washing. Don't forget to wash your own hands, either.

Disinfectants are only effective when used properly. This means, among other things, correctly diluting the stock solution and then leaving the disinfectant in contact with the surface to be disinfected for a period of time. This "contact time" varies by the disinfectant but usually is from 5-10 minutes. Without adequate contact time, no disinfectant will work.

**Chlorine** (regular household bleach) is a very effective disinfectant, and one of the few that can kill protozoans such as giardia. It should be used in a dilution of 1 part bleach to 32 parts water. It must stay in contact for about 10 minutes to assure disinfection. It is the least expensive disinfectant available. There are two major problems with chlorine. It is harmful to the respiratory system to a certain degree, so it must be used with adequate ventilation. It is also very corrosive to metal surfaces. Routine use of chlorine will seriously decrease the life expectancy of metal cages and cups..

-The National Cockatiel Society

**F10SC Veterinary Disinfectant** is a total spectrum disinfectant that is registered by the APVMA (nr. 54149) and is available for use in the veterinary/animal, bird and reptile housing in Australia. It is also approved as a TGA Hospital Grade Disinfectant, has an AQIS IOA for use in food export manufacturing plants, and is registered by NZ & UK MAF.

It boasts a total spectrum microbial kill (bactericidal, virucidal, fungicidal, sporicidal, tuberculocidal) and an unmatched safety of the product itself in terms of not adversely affecting humans or animals (it can even be used around birds with respiratory diseases). Non-corrosive, non-toxic, non-tainting, non-irritating, totally safe to handle and not hazardous. Its biodegradable and given an EU Ecological rating of "zero hazard" (so suitable for septic systems too)

-Chemical Essentials



## 5.2 Record Keeping

When housing Cape Barren Geese, detailed records should be kept on the following things;

- **Identification:** This includes species, name, sex, band numbers, microchip numbers, and any unusual identifying features or marks on the bird.
- **Parentage:** Any available information on the birds parents.
- **Previous history:** Any information on previous owners and veterinarians.
- **Current environment:** How the bird is housed, where the cage is located, current diet, any other pets in the environment, what type of water the bird is drinking, what types of disinfectants you are using, general husbandry practices.
- **Observations and symptoms:** The birds temperament and behaviour patterns, any unusual symptoms, condition of droppings, any changes in colour of cere and legs, changes in diet, behavioural problems and any recent exposure to unusual circumstances or environmental factors such as stress or chemicals.  
-The National Cockatiel Society
- **Veterinary examinations:** reasons for exam, vet findings and any operations or treatments provided.
- **Reproductive stage:** Condition, behavior (how severely do they defend their nest, should it be noted as hazardous for keepers to enter), date of mating, number of eggs, location of nest, any diet changes.
- **Movements:** within the park, or between institutions.
- **Size and Weight measurements:** record date of measurements, height, cere to tail, wingspan, and weight.

Once this information is gathered together into one place it becomes very useful for the management of an individual animal and can also provide insights into a species in general.

ARKS (animal record keeping system), the electronic system currently used to record and store animal data in many zoos, is part of a larger system called ISIS (International Species Information System). Animal data from nearly 650 zoos and aquaria worldwide are sent to the main ISIS database, creating a fantastic resource that has enhanced the co-operative work of zoos worldwide.

The ISIS website details which species are held in which zoos and therefore provides invaluable data to ISIS members, studbook keepers and species program managers, who require information for co-operative breeding program and animal acquisition. Currently ISIS is working with experts world-wide to create a web-based global database of information on more than 2 million animals and their environments. It is called ZIMS (Zoological Information Management System).

-Zoological Society of London

-ISIS

### **5.3 Methods of Identification**

The most common method of identification for birds is leg bands; the ABBBS has recommended guidelines for the Cape Barren Goose;

#### **Size 15, Stainless Steel.**

Measurements:

- 22.0 mm internal diameter
- 12.0 mm height
- 1.0 mm gauge

Stainless Steel bands are extremely durable and appear to be immune from crevice attack and staining. However, they are difficult to close due to 'spring back'.

This method of ID is painless with minimal risk to the animal. If the Goose escapes it would be possible to spot the escapee without having to catch every wild Cape Barren in the surrounding area

-[ABBBS](#)

A microchip is a second method of identification. It is generally implanted in the left breast muscle in birds. This form of ID is not visible, and is therefore aesthetically pleasing to the public. However, it does have its downside. A light general anaesthetic is used during the insertion and there is the possibility of complications. There is a possibility of a puncture wound becoming infected, microchips can migrate to a different part in the body, and, of course, the Goose has to be caught in the first place for identification.

-[Birdvet.com.au](#)

Another option is wing banding. However, this is large and not aesthetically pleasing to the public if the bird is exhibited.

Photo ID may be used, however it is difficult to decipher between many of the same species and hard to prove ownership in the case of theft.

Cage tags are a form of identification of a species enclosed. These need to be used and updated regularly.

### **5.4 Routine Data Collection**

See record keeping 5.2 previous page and include any areas where information may need to be collected for long term studies, for example egg weights and precise diets given to the geese through out the year

## 6 Feeding Requirements

### 6.1 Diet in the Wild

The Cape Barren Goose is a grazing bird that finds its food by the edges of lakes and along the seashore, often grazing in open farm paddocks. It eats predominantly the common island tussock *Poa poiformis* and other vegetation such as tussock grass, spear grass, barely grass, clovers, sedges, succulents, various herbs, leaves, grasses and seeds.



Above and below: examples of native tussock grass



## 6.2 Captive Diet

### NUTRITIONAL REQUIREMENTS

- Precise nutrient requirements have not been calculated for most species of waterfowl. In general, food with a higher protein level is required for breeding than for maintenance, and extra fats and/or carbohydrate may be required in winter. The protein level for downy youngsters is higher than an adult maintenance diet, but a protein level that is **too high** may be associated with problems such as **Angel Wing**, leg problems and Gout. It has been recommended that crumbs with a protein level of 19-20% may be given initially, with this being reduced to about 15% from two to three weeks old.
- It should be remembered that nutritional requirements vary with the time of the year and the weather, as the physiological demands on the birds change. Requirements for feeding in winter when energy is required to maintain body temperature are not the same as during the breeding season or during the moult, when more protein but less total energy may be required. Even within the winter period, energy requirements will increase in particularly cold weather, and will decrease in mild spells or if waterfowl are provided with indoor, and in particular, heated winter accommodation.
- **N.B.** the level of specific nutrients such as vitamins and minerals required is higher for good fertility, embryo development and chick growth than simply for egg production. Layers pellets may contain similar levels of protein to breeder pellets but lower levels of vitamins and minerals, and are not as suitable for breeding waterfowl. Some may also contain excess calcium, being formulated for increasing poultry production, and may not be appropriate for waterfowl.
- There should be awareness that diets should not be too high in, or imbalanced, thereby providing excess of any single ingredient.
- Overweight waterfowl usually do not breed as well and may develop fatty liver degeneration. Care should be taken not to allow Arctic-breeding Geese, in particular, to become overweight, for proper breeding. Fatty infiltration of the liver may be reduced by feeding adequate levels of chlorine chloride.

-Food and Feeding for Birds

### TYPES OF FEED PROVIDED

#### Grain:

- Wheat is generally preferred when compared with barley or oats. Mixed grains (e.g. wheat, barley, rolled oats, corn) may also be used, with cracked corn being particularly useful in winter as it provides extra calories and oil which keeps the feathers supple and waterproof.
- Unsupplemented grains, however, do not constitute nutritionally balanced diets and must be fed sparingly with pellets and / or supplements.

Wheat



Cracked Corn





### Poultry pellets and other prepared foods:

- Traditionally, pellets designed for poultry, being commonly available at a reasonable price, have been used for waterfowl. These are often not suitable and care must be taken with protein levels.
- Some companies in Australia provide specialised pellets for waterfowl.
- Castlereagh make layer pellets that do not contain animal protein. These can be safely fed to the Geese and the protein level is only 14%.
- Alfalfa or Lucerne pellets should be provided for Geese that do not have access to grass for grazing. Alternatively Castlereagh has NON HEATING complete horse and pony pellets that can provide some of the greens the goose needs. They are only 14% protein and contain no animal protein.
- Turkey diets usually contain too high protein levels for waterfowl. In particular feeds designed for rapidly-growing turkey poults have a very high protein level. The use of these in young waterfowl, particularly species with a slow growth rate in the wild, has been linked to the development of skeletal deformities such as Angel Wing and Perosis (see 7.4).
- Crushed biscuits formulated for dogs and pelleted diets developed for trout, flamingos, cats and dogs have also been used to provide higher protein levels than are typically found in grain. **Care must be taken** as excessive protein in diets for waterfowl may be associated with renal failure, and also requires increased water consumption to remove the excess protein, so that short-term water deprivation may be fatal. Only use for protein deficiencies.



### Grazing and green food:

- Grazing species such as the Cape Barren Goose should be provided with a short grass sward for grazing.
  - If the grass area is not sufficient, as may occur with high stocking densities and/or in winter, supplementation may be provided by means of heads of dark leafy greens staked into the ground, which provides a source of green food to be pulled at. Similarly green foods, such as a whole head of lettuce thrown into the enclosure provide environmental enrichment to the birds while it is torn up.
  - **Note:** Long cut grass should **not** be offered to waterfowl as it may lead to Impaction.
  - They do best if provided with an ample supply of growing grass. However, green foods including lettuce, cabbage etc., and alfalfa pellets, may be used as substitutes. Some of the products available are:
1. Many varieties of lettuces which provide folate and are approximately 0.9g of protein per 100g serve (note; the darker the leaves the more nutrients).



2. Chickory- vitamin c and dietary fiber 1.5g per 100g protein.
3. Endive vitamin c and a 1.25g per 100g serve protein.
4. Tuscan cabbage vitamin c folate and dietary fiber 1.5g per 100g protein.

**Endive**



**Tuscan Cabbage**



**GRIT:**

- Grit is important for the correct nutrition of waterfowl and insoluble grit in appropriate size (e.g. granite grit) should always be available, particularly when grains are fed. Soluble grit such as limestone grit or oyster shell should also be provided, particularly in the breeding season, either in feed troughs or in separate piles on the ground.

-Food and Feeding for Birds

**Shell Grit**



## Feeding

Feeding the birds is a simple task requiring relatively little time and labour.

- Feed the birds daily. This allows the animal attendant to examine the condition of the birds and their holding facilities on a regular basis.
- Put out only as much food as they will consume daily. Do not allow excess feed to accumulate. Old feed that has become damp is an ideal cultural medium for aspergillosis, a fungal disease which affects the respiratory system (see 7.4).
- Birds that are held in outdoor pens should be given only wheat during rainy weather. Wet pellets form a hard crust and are not eaten.
- Evenly distribute an adequate number of feeders throughout the pen. If only one or two feeders are used, the birds will crowd around them, increasing the possibility of aggressive interaction and accidental trampling. -CCAC

## Suggested Diet For one adult Cape Barren Goose per goose per day

| Ingredients                         | Amount /how                                 | Cost per serve (approx)                                                                                  |
|-------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Alfalfa pellets                     | 1 cup in bowl                               | 12 c                                                                                                     |
| Layer pellets                       | 1/2 cup in bowl                             | 7 c                                                                                                      |
| wheat                               | 1 cup in bowl                               | 6 c                                                                                                      |
| Cracked corn                        | 1/2 cup (1 1/2 in winter) in bowl           | 5 c                                                                                                      |
| Rolled oats                         | 1/2 cup in bowl                             | 4 c                                                                                                      |
| Lettuce Iceberg                     | 1 whole                                     | \$1.98                                                                                                   |
| Chickory                            | 1 bunch tied to a stake                     | 99 c                                                                                                     |
| Endive                              | 1 bunch tied to stake                       | \$3.98                                                                                                   |
| Supplements Wombaroo grainivour mix | 4 teaspoons (sprinkled on food) once a week | 44 C                                                                                                     |
| Granit or shell grit                | Constant supply                             | \$16.90 for 25kg                                                                                         |
|                                     |                                             | TOTAL APPROX COST PER YEAR ( if you pay full price for the greens and don't get them donated)= \$2699.70 |

All of the Cape Barren Goose's diet and supplements can be obtained at your local supermarket (for the leafy greens) and local pet suppliers. For locations and phone numbers of the Petbarn chain see **appendix (11)**

## 6.3 Supplements

Vitamin and mineral supplements should be provide once a week (depending on the diet of the goose) and more during breeding and egg production. Complete grainivour bird supplements are fine as long as they are balanced, thus not providing too much of any 1 nutrient e.g. calcium or protein. There are appropriate supplements in the Wombaroo and Soluvet brands.

## **6.4 Presentation of Food**

### **Presentation.**

- All pellets should be fed in a waterproof feeder (or more than one depending on the number of birds in exhibit) to protect from spoilage.
- Granite grit to be served in a separate bowl in another area if desired.
- Wheat (whole) can be served with no weather protection in a bowl elsewhere. It may even be served under water.
- Whole lettuces can be scattered around the enclosure.
- Leafy greens to be tied to stakes so the Geese can pick at them.
- Supplements to be fed on top of food or in water.

### **Enrichment feeding**

- In the wild, Cape Barrens would spend a considerable proportion of their time foraging. In captivity, food is frequently presented in a nutritional but possibly monotonous form, and may be consumable in a short period of time. This may cause behavioral deprivation.
- Food is also usually presented in feed bowls, troughs or similar (to reduce spillage and associated wasting, spoiling and encouragement of vermin); this unnatural concentration of food may lead to excessive competition between individuals, with a risk that subordinate birds may not get sufficient nutrition. Increasing the number of feeding points and spacing them at greater distances should increase the number of birds able to feed at one time.
- At all times, consideration should be made in providing food to making the presentation of the food compatible with the normal feeding behavior of the Cape Barren Goose (grazing, foraging over long periods of the day).
- Food scattered through the enclosure increases foraging behavior and acts as a form of environmental enrichment. -Food and Feeding for Birds
- Hammer a number of stakes into the ground around the enclosure. Ensure these do not have sharp edges and become a hazard. Tie (using a rope tie, not plastic as plastic is a digestive hazard) leafy greens, such as endive, to the stakes to provide grazing / browsing enrichment. Tie a different one to each stake to determine the Geese's favourite.
- Whole iceberg lettuces can be given to the Goose. The Geese tear these apart. Good practice is to hide them in odd locations or spike them just in reach on the aviary wall so they have to stretch for their food.
- Place a bowl of wheat underwater on the edge of the pond. The water will keep the wheat clean, the bowl will hold the wheat in and it will encourage the Geese to look in the water even when there is nothing there.
- Cotton stockings of wheat grass can be hung from the enclosure roof so that they swing when the goose tries to eat the grass growing out through the stockings. This may provide hours of entertainment, especially when the leafy greens haven't been fed yet for the day. (note; when changing the water don't forget to water the wheat grass balls so they don't die) It may also be an idea to have more than one growing outside the container to swap with at times as the geese may not let the wheat grow at all (they are constant daylight grazers)



## 7 Handling and Transport

### 7.1 Timing of Capture and Handling

Capture should take place in the early morning because;

- The temperatures are still cool so the goose will not over heat from exerting too much energy.
- The public are less likely to be present.
- In cases of extended travel, the goose will have time to adjust to the transport box before dark.
- For an internal zoo transfer, the goose will have time to adjust to its new enclosure before dark.

### 7.2 Catching Bags

Bird bags may be used for short periods e.g. for transfer between enclosures. The bags are easily cleaned, well ventilated and reduce stress to the goose because of the visual barrier. The bag should be made of a soft material with a drawstring that is long enough to loop around the neck of the bag with a simple half hitch. The strings prevent the birds from escaping and is also ideal for hanging the bag up with the bird inside. The bags should be of a large size; 100 by 100cm is suitable.

Some of the common sense rules of bag use include;

- Each Goose should be in its own separate bag, to prevent injury and help the goose be comfortable with minimal stress.
- Never leave bags containing birds on the ground or a seat/ chair where somebody can stand / sit on them.
- Never hang Geese in a place where they may be forgotten.
- Never hang bags over water.
- Never place bags containing birds on a flat surface such as a table where they may start moving and fall injuring themselves.
- Bags must be turned inside out after release to remove droppings, and wash regularly– if possible after every use.
- Check bags for frayed seams and loose material, and repair or trim. This prevents any unnecessary entanglement.

-The Handling and Storage of Birds

### 7.3 Capture and Restraint Techniques

**Use of a net** The most successful way of capturing a Cape Barren is with the use of a large net.

1. Enter the enclosure with the net,
2. Select the Goose,
3. Edge it into a corner,
4. Place the net over its head, all the way to the ground,
5. Through the net, secure the goose by using the technique below,
6. Transfer the goose to the catching bag or transport container.

**Physical restraint of the wings** This technique is perfect for lifting the goose into a transport container or other. Refer to 8.2.2 Physical restraint

**Pigeon grip** This technique is useful for carrying and holding the goose still. Refer to 8.2.2 Physical restraint

**Mechanical restraint** Free range Geese may prove a little harder to catch, so a trap of some description can solve the problem. The trap could be a metal cage with automatic door, the use of a room, outdoor shelter, or even a holding pen.

1. Train the Geese that this particular area provides food by feeding there occasionally or constantly for 1 week before the planned capture.
2. On capture day, provide feed in this area early in the morning and monitor Geese.
3. When they enter cage automatically close the door (or by hand if necessary)
4. Capture goose inside using one of the previous techniques.
5. Release any unwanted animals that may have been captured also.

## **7.4 Weighing and Examination**

Prior to carrying out an examination of the goose look into the following:

- **History (records):** age, sex, origin, time on current diet, contact with other birds, past observations and past veterinary exams.

### **Conduct a physical examination:**

#### **Initial Observation:**

1. **General condition:** does the goose look healthy, any feathers missing or disheveled, good posture
2. **Attitude/ temperament:** does it look calm/ stressed? Is it behaving normally?
3. **Respiration:** Count its breaths per minute before capture.

#### **Post Capture:**

1. **Obesity/ malnutrition:** Find the featherless area at the pectoral muscle (the birds breast), blow hard on the area to part the feathers then hold them apart to examine. Look at the keel. If it is sticking right out the goose is undernourished. If the breast pokes out and the keel is sunken it is overweight. A healthy goose has a rounded breast with the keel protruding only a couple of millimetres
2. **Eyes:** Are they bright and alert? Is there any fluid or stains surrounding the eyes? Do they have a blue / grey tinge to them?
3. **Skin:** Does it have any lesions? Is it of a normal colour? Is there chunks of dead skin present on the surface?
4. **Beak:** Is it of the correct shape? Is the cere normal with no lesions? Is there any fluid weeping from the nostrils?
5. **Feathers:** Are they preened and even? Are the tail feathers equal on both sides? Are there a large number missing (or any abnormal patches of skin showing)?
6. **Ears:** Are they clear of earwax build up or foreign objects?
7. **Oral cavity:** Look inside the oral cavity for any abnormalities. Is the mucus membrane a normal colour? Are there any lesions present?
8. **Vent:** Is the vent free of dried faeces? Is it of a normal colour and size
9. **Tumors or swellings:** Is the entire body free of abnormal swellings?
10. **Legs and wings:** Check for tenderness and any abnormalities. Are the feet and webbing healthy (no lesions)? Do the toe nails need clipping?

- 11. Weight:** Once the Goose is an adult, the weight should remain relatively constant. Weight should be measured in grams not ounces to detect small changes. Weigh the goose while in a catching bag and minus the weight of the bag.

If any of these things are out of the ordinary a vet check / tests may be required such as the following:

- Appraisal of droppings– appearance and tests for the presence of parasites.
- Tests for Chlamydia (psittacosis) or other diseases.
- Blood tests– amount and distribution of blood cells, blood parasites, imbalances in biochemical function and organ dysfunction.
- Virus screening– for existing and emerging avian viruses.
- Microbiology– a culture from the choana (throat) or cloaca (vent) to determine abnormal growth of bacteria or yeast.
- Radiograph– for bone fractures size and relationship of internal organs, condition of lungs and air sacs, presence of foreign bodies or soft tissue masses such as tumors.

-Health Exam for Birds

## **7.5 Release**

To release the goose back into its enclosure follow these steps to ensure the goose remains safe and happy:

1. Place goose back in its catching bag, tie drawstring and take to enclosure.
2. Release the goose into its holding yard (important if it belongs in an intra– species enclosure or is not the dominant goose as the other inhabitants may attack it while it is in a vulnerable state). Be sure there is food and water in this area.
3. Leave enclosure and monitor goose. Is it behaving normally? Is it in any shock from capture? Is its respiratory rate back to normal?
4. Open holding yard door half an hour after initial introduction; earlier if the goose is showing signs of wanting to be on the other side with it's mate, or later if it needs continued monitoring.
5. After release, check the goose periodically for the rest of the day.

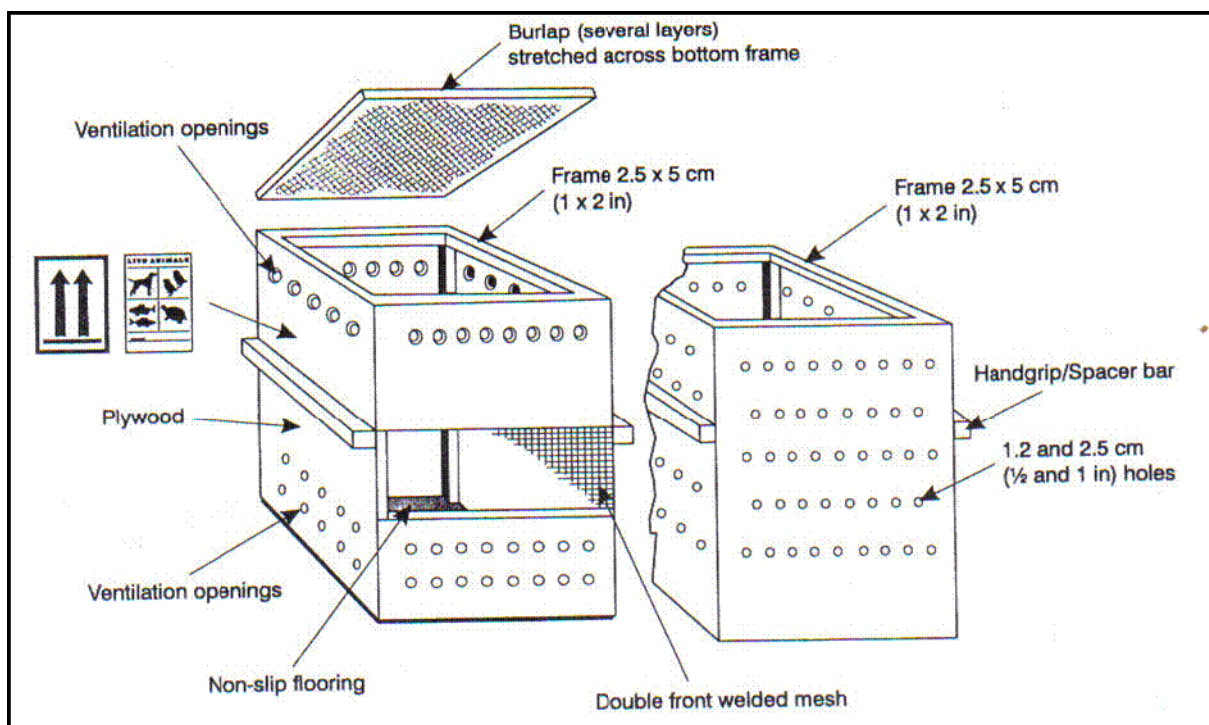
## 7.6 Transport Requirements

### 7.6.1 Box Design

- **Materials:** Wood, 1.8cm plywood, non-toxic plastic, fiberglass, synthetics, wire mesh, burlap, fine nylon or similar mesh.
- **Size:** The normal habits and necessary freedom of movement will determine the size. Also the number of compartments it has. The height of the container must allow the goose to stand with its neck in a natural position, but not fully extended. The width of the container must allow the goose to sit down and turn around easily. Compartments can be provided for body support for rough journeys but must allow the head and neck free movement.
- **Frame:** A solid wood frame of 2.5 by 5cm either screwed or nailed and glued with a non-toxic glue.
- **Sides:** 1.8cm thick plywood, suitable materials must line the sides and roof to provide protection.
- **Handling spacer bars/ handles:** must be provided to allow effective ventilation during trip (see diagram).
- **Floor:** solid and non-slip.
- **Door:** a means of entry and exit must be provided. The roof can act as a lid or either the front or rear can be sliding or hinged. Which ever method is used there must be a secure means of fastening.
- **Ventilation:** openings approximately 2.5cm in diameter must be provided at about 5cm distance apart over 3 sides of the container. Whenever openings are covered in mesh, care must be taken that there are no sharp edges present within the container. All edges must be covered with a smooth material.

**Diagram 1**

-IATA Live Animal Regulations



-IATA Live Animal Regulations



**Diagram 2**

-IATA Live Animal Regulations

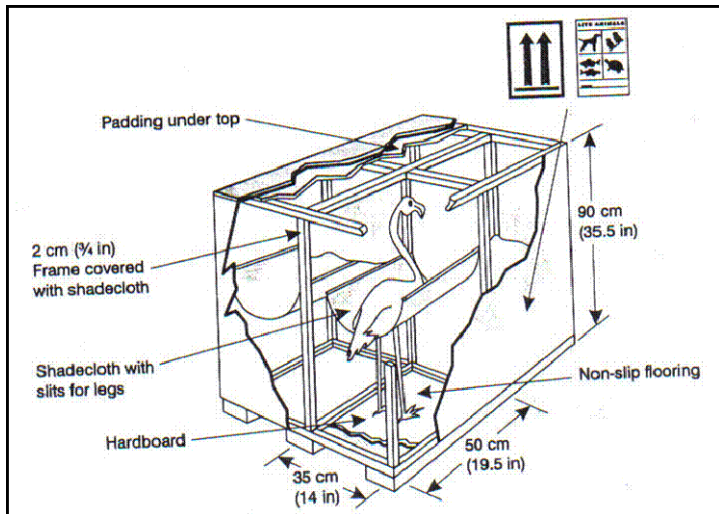
### **7.6.2 Furnishings**

Furnishings such as perches are non applicable. If body support is required shade cloth may be added with slits for legs (see diagram 2).

### **7.6.3 Water and Food**

Separate food and water containers must be provided for each bird. They must be accessible for filling and the sides of the containers must be flanged to prevent spillage. Birds do not usually require additional food or water

during 24 hours after the time of dispatch. If it is required due to hot weather or an unforeseen delay, provisions must be made for assisted feeding and watering.



### **7.6.4 Animals per Box**

Geese should be packed into individual containers or compartments of the container. However, compatible pairs may be packed together if there is a previous happy relationship.

-IATA Live Animal Regulations

### **7.6.5 Timing of Transportation**

- For long distance travel like shipping it is advisable that the capture is made a few days before the trip so that the Geese can get used to their closed environment and health may be observed.
- For short distance and same day release, the goose should be transported early in the morning to ensure that there is still plenty of daylight left for it to gather its bearings at the other end before dark.

### **7.6.6 Release from Box**

Release depends on a number of factors;

- For interstate or overseas transport the Geese will need to be released into quarantine for a set period of time to prevent the potential spread of disease.
- For release into an empty enclosure place transport container in enclosure in the early morning with the door open. This allows Geese to exit of their own will and they have the rest of the day to find where the food is and settle in. Monitor the Geese during the day.
- For release in an already inhabited enclosure it is best to place the Geese in a cage covered on three sides inside the enclosure. This allows the keeper to monitor behavior and asses whether it is safe to release. Be sure there is food and water in this area.
- Leave enclosure and monitor the goose. Is it behaving normally? Is it in any shock from capture? Is the respiratory rate back to normal?
- Open door that day if you see fit or later if it needs continued monitoring.
- After release, check on the goose periodically for the rest of the day.

## 8 Health Requirements

### 8.1 Daily Health Checks

For daily overall inspection of the birds, special attention shall be paid to:

- Bodily condition,
- Movements and other behavior patterns,
- The condition of droppings,
- Feed and water consumption,
- Growth,
- Records shall be kept of any changes.

-Standing comity for the European convention of the protection of animals

### 8.2 Detailed Physical Examination

Attention to detail is necessary when conducting a physical exam. Each part of the bird needs to be examined separately, always considering health problems the goose is susceptible to. Always remember to monitor the food and water intake of the bird so that these factors are taken into account if any abnormalities are found.

**Weight:** Find the featherless area at the pectoral muscle (the birds breast). Blow hard on the area to part the feathers, then hold them apart to examine. Look at the keel. If it is sticking right out the goose is undernourished. If the breast pokes out and the keel is sunken, it is overweight. A healthy goose has a rounded breast with the keel protruding only a couple of millimetres. Once the Goose is an adult the weight should remain relatively constant. Weight should be measured in grams, not ounces, to detect small changes. Weigh the goose while in a catching bag and minus the weight of the bag. Has there been a change of weight since the last weighing? What is the reason for this?

**Eyes:** Are they bright and alert? Is there any fluid, stains or scabs surrounding the eyes? Do they have a blue / grey tinge to them? Can the goose see?

**Skin:** Are there any lesions present? Is it of a normal colour? Are there chunks of dead skin present on the surface? Does it look inflamed? Are there scabs present, or any signs of external parasites?

**Beak:** Is it the correct shape? Is the cere the normal colour with no lesions? Is there any fluid weeping from the nostrils?

**Feathers:** Are the feathers preened and even? Are the tail feathers equal on both sides? Are there a large number missing, or any abnormal patches of skin showing? Take note that the wing flight feathers will be uneven if the wings are clipped.

**Ears:** Are the ears clear of earwax build up or foreign objects?

**Oral cavity:** Look inside the oral cavity for any abnormalities. Is the mucus membrane a normal colour? Are there any lesions present?

**Vent:** Is the vent free of dried faecies? Is it of a normal colour and size?

Are there any traces of diarrhea?

**Body:** Is the entire body free of abnormal swellings / tumors? Check for tenderness and any abnormalities around the legs and wings. Are the feet and webbing healthy (no lesions)? Is the goose lame? Does the goose have free movement of its neck, wings and legs (they are not paralysed)?

**Respiration:** Is the respiration rate normal? Check the goose is not making any wheezing sounds. Does it cough or sneeze?

**Behavior:** Asses the goose's behavior. Is it abnormally flighty? Is it sitting too still with a dull expression on its face?

**Capillary Refill:** Check the Capillary refill by pressing firmly on the feet with a finger or thumb. Time the blood refill back into the pressed spot. If it takes longer than 2-3 seconds, the goose is dehydrated.

-Health Exam for Birds

### **8.2.1 Chemical Restraint**

**Note:** A vet should be present if chemical restraint is to be used on the Goose.

Every anaesthetic agent has specific advantages and disadvantages, and there is no single agent that is suitable for the chemical immobilisation of all bird species under all circumstances.

Safe and effective drug dosages will vary with the, age, sex and body condition of the bird. In addition, there can be seasonal variations in their response to certain agents. A prolonged recovery time or need for special equipment may make some choices impractical for use in the field.

The effects of drugs on many avian species have not been determined. When information concerning the effect of an anaesthetic drug on the study species is unavailable, it is recommended that pre-experimental testing using low dosages of the drug is initiated under the supervision of a veterinarian experienced in avian anaesthesia.

Certain things need to be considered when using chemical restraint in birds. For more information please go to **appendix (8)**.

### 8.2.2 Physical Restraint

#### Physical restraint of the wings

1. First capture with net or for a tame goose simply grab from behind (be sure not to repeat if you miss the first time as this will cause unnecessary stress— use the net).
2. Secure the goose by grasping each wing by the base, right where it meets the body. The goose can be lifted and held in the air like this or left with its feet on the ground / table.
3. A blanket or bag may be used over the head as a visual barrier during the procedure. Blindfolds can be used also .



#### Pigeon grip

1. Inside a net or bag, secure the bird by placing both the wing tips over the tail and grasping all three together in your right hand.
2. With your left hand bring both feet back under the tail and place them through the fingers of your right hand that is holding the tail. If the legs are too large to place through the fingers, simply hold the legs, wings and tail all together in the right hand.
3. Once secure, the body of the goose can be brought up and tucked under your left arm. From this position it can be held with relatively low disturbance from the goose.
4. Note: Do not squeeze the goose's body with your left arm as it will be unable to breath.
5. When using this for an examination, a blanket can be placed over the head to lower stress levels, or if the goose is attacking with its beak.
6. It is the personal opinion of the compiler that the pigeon grip is the most effective grip.



### **8.3 Routine Treatments**

The best prevention of health problems is good hygiene, please refer to 5.1 hygiene and cleaning for specific procedures.

#### **Worming:**

- Worm your Goose every 3 months with an all wormer.
- Avitrol Plus bird worming syrup is appropriate for treatment of threadworm, caecal worm, roundworm, Grapeworm, gizzard worm and railletina species of tapeworm.  
Active ingredients: Levamisol hydrochloride, praziquantel.
- Directions: Combine 5ml to 20ml of water, and use this as the only drinking source for 24 hours. Repeat in 14 days. -[Petalia.com](http://Petalia.com)

#### **Mite and Lice Control:**

- Treat bird and cage annually (in summer) just in case an infestation has gone unnoticed.
- Aristopet Bird Mite and lice spray is an example. Directions: Remove all food and water from the enclosure (or the goose if that's easier). Hold the spray 40cm from the goose and spray directly onto the bird. Avoid eyes and do not spray in a confined space. Also spray enclosure and all furniture.

#### **Prevention of Coccidiosis:**

- Use for goslings or in times of wet if you are worried.
- Sulpha Quin Concentrate: Directions: give to 2-3 week old Goslings, 3ml per litre of water for two days followed by three days of fresh water (just water). Continue alternating these till the goslings are 12 weeks old.

All of the above products can be found at your local pet suppliers, for locations and phone numbers of the pet barn chain see **appendix (12)**

#### **Taking Blood for testing:**

Blood is taken from the brachial vein. The underside of the wing is held still, and a moist Q-tip is used to spread open the feathers to reveal the white vein. A sterile syringe needle is used to puncture the vein (usually a 28 gauge), entering laterally (thus at about the same plane as the vein itself). A drop of blood quickly forms and is taken up with a heparin-treated capillary tube.

A piece of cotton is pressed gently to the wound to stop bleeding and the wing placed back against the body. The capillary tube then can be used to make a blood smear and dried blood dots on filter paper. The smallest wound should be made to ensure that bleeding stops very quickly. Only 1/3 to 1/2 capillary tube of blood should be taken.

The syringe needles are used once before being autoclaved. After a few uses, the needle becomes blunt (not obvious to the eye!) and can damage the vein, so they should be discarded after a few uses. -[How to catch and take blood from birds and lizards](#)



## **8.4 Known Health Problems**

The Cape Barren is susceptible to many avian diseases. Some endemic diseases relevant are listed below. For more information on these diseases go to appendix (6)

### **Bacterial Diseases:**

- Anthrax (zoonotic). Uncommon in Australia, however the risk is still apparent
- Avian Tuberculosis (zoonotic)
- Avian Pseudotuberculosis (zoonotic)
- Botulism (zoonotic)
- Erysipelas
- Mycoplasma Infection
- Necrotic Enteritis
- Psittacosis (Chlamydiosis) (zoonotic)
- Salpingitis
- Salmonellosis (zoonotic)
- Spirochaetosis
- Streptococcosis

### **Viral Diseases:**

- Avian influenza (zoonotic). Has the potential to become endemic in the future
- Avian encephalomyelitis
- Duck Hepatitis B
- Avian Pox, Fowl Pox
- Newcastle Disease (zoonotic). Six outbreaks in Australia since 1998
- Reticuloendotheliosis Infection
- Murray Valley Encephalitis

### **Protozoan, Fungal and Yeast Infections:**

- Aspergillosis (zoonotic)
- Coccidiosis
- Cryptosporidiosis
- Giardia
- Mycotoxicosis
- Sarcocytosis (Rice Breast Disease)
- Toxoplasmosis (zoonotic)
- Trichomoniasis

### **Internal Parasites:**

- Caecal Worms (nematodes)
- Flukes (trematodes)
- Gapeworms
- Gizzard Worms
- Heartworm
- Large Round Worm (nematodes)
- Tapeworms (cestodes)
- Threadworms (nematodes) (capillaria infection)

**External Parasites:**

- Fowl Tick
- Lice
- Air sac Mites
- Depluming Mites
- Red Mites
- Subcutaneous Mites
- The Scaly-leg Mite
- Tropical Fowl Mite
- Stickfast Flea

**Nutritional and metabolic Disorders:**

- Angel Wing
- Biotin Deficiency (vitamin H)
- Bumble Foot
- Calcium and Phosphorus Deficiency
- Choline Deficiency
- Folic Acid Deficiency (folicin)
- Manganese Deficiency (perosis)
- Nicotinic Acid Deficiency (niacin)
- Pantothenic Acid Deficiency
- Potassium Deficiency
- Pyridoxine Deficiency (B6)
- Riboflavin Deficiency (B2)
- Rickets
- Sodium and Chloride Deficiency (salt)
- Selenium/ vitamin E Deficiency (White Muscle Disease, Capture Myopathy)
- Thiamin Deficiency (Vitamin B1 Deficiency or Polyneuritis)
- Vitamin A (Retinole) Deficiency (Bumble foot, Hypovitaminosis)
- Vitamin B12 Deficiency (Cyanocobalamin or Cobalamin Deficiency)
- Vitamin K Deficiency
- Zink Deficiency

See **Appendix (6)** for more specific information on each disease.

## 8.5 Quarantine Requirements

When exporting the goose overseas the quarantine requirements change depending on which country it is to be exported to. To find out these requirements call Quarantine on (02) 83347444.

The Cape Barren Goose is a protected species. There fore to transfer the goose between states alive requires a permit from National Parks and Wildlife. For information on how to obtain a permit see **appendix (9)**.

There are no quarantine periods required from Quarantine Australia when transporting a Cape Barren Goose between states.

### Quarantine guidelines for Aves

Although no quarantine is REQUIRED for the Cape Barren Goose to be transferred between states, a new animal should always go through a quarantine period before being entered into the collection. The following guidelines for quarantining Aves are useful to follow when acquiring a new Goose (Not all diseases listed are endemic to the goose. See known health problems for which diseases to test for).

### Health screening while in quarantine

Quarantine should last for **30 days**. But remember that some small species may die if closely confined for as little as 24 hours. Birds at high risk of Newcastle Disease should be quarantined for **60 days**.

The following are recommendations for appropriate testing procedures for diseases of birds while held in quarantine. When large numbers of birds of the same or related species are held as a flock or contiguous group, a series of random faecal samples should be examined. The serology screen should be appropriate for the disease profile of the species concerned.

1. Faecal examination, direct and flotation, for trichomonads, other motile protozoa and coccidia, gizzard worms of ducks and Geese and tapeworms in small passerines. Stain faecal smear (Gram) and examine for *Candida sp.* and *Clostridia sp.*, stain faecal smear (Ziehl-Neelsen) for acid fast bacteria but remember that *Mycobacterium 61avium* may be shed only sporadically thus a negative smear is not significant. For the diagnosis of avian tuberculosis, a liver biopsy may be more useful.
2. Check for ectoparasites, especially *Amblyomma sp.* ticks that can be vectors of cowdriosis-heartwater. If present, treat with an acaricide.
3. Carry out appropriate serological tests for chlamydiosis (psittacosis) and if positive, confirm by cloacal swab cultures. If culture is positive, the bird must be treated if of conservation value or destroyed if not. Treatment, which in some countries is mandatory for psittacine birds in quarantine, is lengthy, consisting of **45 days** continuous feed medication with chlortetracycline. **Note: Chlamydiosis (Psittacosis / ornithosis) is a dangerous zoonosis.**
4. Faecal cultures for *Salmonella sp.* and *Campylobacter sp.*

5. Collect samples (choanal and cloacal swabs) for virus isolation from all incoming birds. Samples may be pooled from members of a flock. Samples for virus isolation should be routinely collected from all birds that die in quarantine. All virus isolation tests should be negative in birds destined for release or entry into captive breeding flocks.
6. Carry out complete Blood Count and PCV.
7. Carry out serology/ELISA, as appropriate, for aspergillosis, *Chlamydia sp.*, paramyxovirus 1 (PMV-1), PMV-2, PMV-3, Eagle herpes virus, pigeon and raptor viruses, adenovirus, avian pox, avian influenza, mycoplasmosis and, for psittacines.
8. "beak and feather virus" disease, Pacheco's disease and polyoma virus disease. All ELISA tests should be negative in birds for release or entry into captive breeding flocks.
9. Check raptors, *Otididae* (bustards) and *Columbidae* for oral trichomonosis.
10. Examine blood smears for avian malaria, *Babesia sp.* and *Leucocytozoon sp.*
11. Carry out endoscopy for aspergillosis in rare and valuable species.

**Note: Birds destined for release into a Newcastle disease-free area should not originate from an area where Newcastle disease is present.<sup>4</sup>**

**Vaccination of exotic avian species against Newcastle disease is not recommended.**

-Quarantine Australia

-National Parks and Wild Life NSW

-Quarantine and Health Screening Protocols for Wildlife

## 9 Behaviour

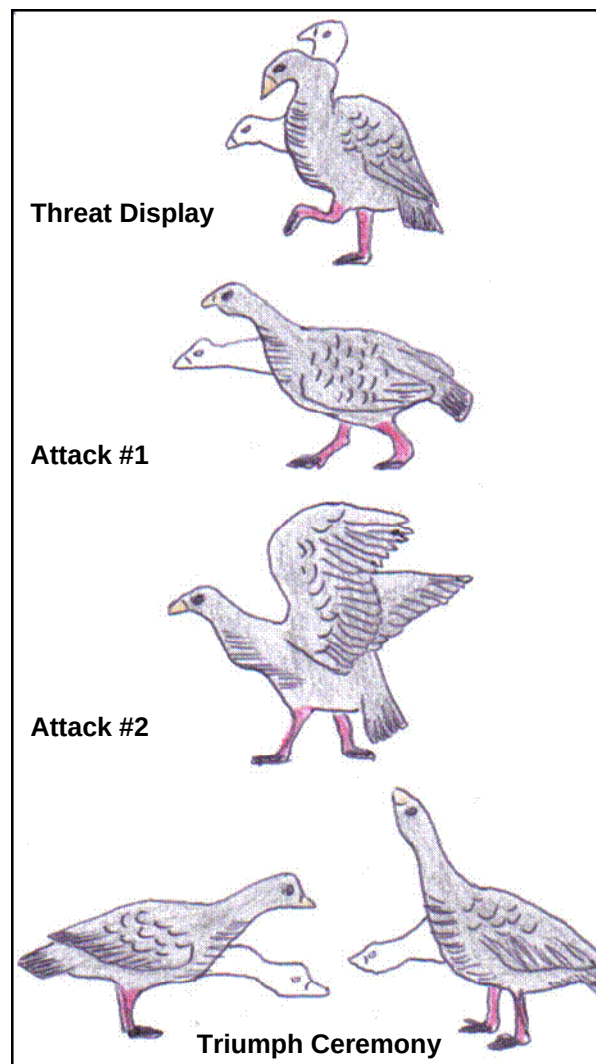
### 9.1 Activity

- Almost all of their daylight hours are spent grazing. They do this by using the tip of the bill and a backwards pulling motion of the head to shear off herbage.
- Roosting is carried out in protected areas of the enclosure, mostly on the ground or close to it. They go to roost 30 minutes after sunset and return 30 minutes before dawn.

### 9.2 Social Behaviour

- Gregarious except when nesting in flocks made up of families, pairs and non breeding adults. Within the group there is a stable dominance hierarchy.
- The Cape Barren Geese show behaviour similar to that of Anserine Geese having a well marked triumph ceremony and threat displays.
- Agonistic interactions are frequent if housed in groups or with other species. These are apparently associated with individual spacing or positions in hierarchy. Pairs are aggressive much of the time in defense of territory or young.
- This behaviour varies in frequency, with peaks occurring in pre-laying, incubation and post-hatching periods.
- Agonistic behaviour usually performed by male though both the pair are vigilant.
- Aggressive encounters between Cape Barren Geese usually consist of parallel walking and facing off, but occasionally may intensify to THREAT DISPLAY This is where the Goose ruffles its feathers, arches its neck, lowers its head, raises its folded wings and calls.
- ATTACK consists of the attacker walking, running or flying in the opposition's direction, calling with its neck feathers ruffled. The opponent will avoid or fight.
- FIGHTING involves physical contact using neck, bill, feet and wings (especially the bony knobs of the metacarpals).
- This is followed by the TRIUMPH CEREMONY in which both birds turn and face each other with necks outstretched and tail feathers spread; heads raised and lowered whilst the triumph call is uttered.

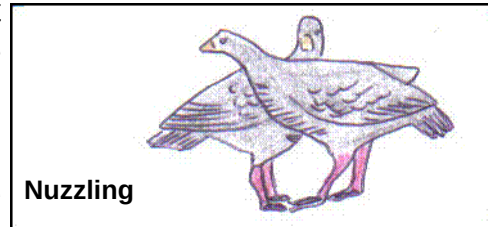
-Handbook of Australian, New Zealand and Antarctic Birds





### 9.3 Reproductive Behaviour

- PAIR-FORMATION is instigated by the male or female. It begins with waltzing, where one or both walk around the other slowly, holding lateral posture, and slowly bowing heads.
- This may be followed by a griffin display in which one or both face the mate, stand upright, hold the neck high with head down, flap their wings and make a hissing call. This terminates with the triumph ceremony (e.g. on previous page)
- COPULATION happens on the ground (not in the water as in other waterfowl) and is most often observed during early incubation period but persists into post-hatching period.
- Initiated by mutual or unilateral nuzzling (e.g. right) of the lower back of partner. The nuzzling individual avoids and turns, and the pair rotates. Female may then squat, after which the male mounts and mates. Copulation is of a short duration and is followed by the triumph ceremony.
- Female will brood while male defends nest against predators or trespassers. Family remains in close contact when the goslings hatch and have a distinct contact-call to keep in touch -Handbook of Australian, New Zealand and Antarctic Birds



#### *Behaviour of the Adults post hatching (Study done on wild Geese)*

- Both the adult males and the adult females spent a large proportion of the daylight hours performing vigilance behaviours. They became more vigilant the week after the goslings hatched, remained highly vigilant in the first 4 weeks, and then became progressively less vigilant.
- In the first 3 weeks, the adults of two observed wild groups spent most of their time watching, and were rarely observed to feed. The males spent a greater percentage of the day watching than did the females.
- Furthermore, the gander was the attacker against potential predators and conspecific intruders. The more time the adults spent watching, the less time they spent feeding. -Post hatching factors and clutch size in the Cape Barren Goose

#### *Behaviour of the Goslings post -hatching*

- The goslings spent little time performing vigilance behaviours. At the end of the first week after hatching, they increased both the percentage of daylight hours spent feeding and the duration of feeding bouts; both these measures remained high for the next 3 weeks, then decreased.
- Runs towards the mother were very common in the first 3-4 weeks after hatching. Goslings ran towards their mothers in three contexts:
  1. When the adults made the predator alarm call.
  2. When the mother walked away from the goslings.
  3. After the goslings had walked away from the mother. The highest incidence of runs was at 1 week after hatching, when 74% were of the third type.
- Goslings slowly walked forward while their heads were lowered during feeding bouts. As the duration of feeding bouts increased after week 1, they walked further. If a gosling interrupted a feeding bout by lifting its head to look around, it often ran towards its mother.
- In the second week after hatching, when goslings looked up they re-orientated themselves towards their mother, and in the next feeding bout they walked towards her while grazing. -Post hatching factors and clutch size in the Cape Barren Goose

- Interactions between goslings were common in the first 2-3 weeks after hatching, especially in the first week. In these interactions, one would attempt to peck another on the head, neck and back. The pecked gosling either ran away or crouched.
- Most of these interactions occurred after a gosling began a type 3 run, and either ran into or passed another gosling, which then pecked it. The change in frequency of interaction in the first 2 weeks after hatching was correlated with type 3 runs, but not with other types

-Post hatching factors and clutch size in the Cape Barren Goose

#### **9.4 Bathing**

- If your enclosure does not have a pond (it is not essential as the Cape Barren Goose rarely enters the water) you must provide a bath for it. Allow room for the Goose to fit completely in the water (1m by 1m is sufficient) and deep enough for the body to be submerged if it was to sit down (approx 50cm).
- The water should be clean and replaced on a regular basis (especially if the Geese use it as a preferred drinking spot).
- No soap should be added to the water, as this will interfere with the feather's natural oils. Fresh water only.
- Put the bath in a shaded area. If it is in direct sunlight, particularly in summer it could reach high temperatures being such a small body of water.
- To bath the Goose walks into shallow water and ruffles its wings in a manner that causes water droplets to land on its back and in between its feathers. It carries on doing this till it is relatively wet, then it will leave the water (or stand up in the shallows) and preen its wet feathers putting them all back in place.
- Sprinklers also work well and this encourages natural preening behavior.

#### **9.5 Behavioural Problems**

- Aggressive nature, especially during the Breeding season. They may attack other animals, other Geese and even humans.
- This means there is a risk of having stressed or injured animals, and difficulty cleaning the aviary during the breeding season. It can also lead to no offspring.
- Stereotypic behaviours may be apparent in some Geese, if this is so provide a naturalistic environment, and enrichment. If this does not work try clipping their wings and allowing them to free range.

#### **9.6 Signs of Stress**

- A goose with its mouth open and seeming to be struggling for breath.
- Standing very tall and skinny.
- Eating less than it normally would (for that time of year).
- Vocalising continually.
- Feather plucking.
- Changes in the quantity of droppings.
- Panting, holding the wings away from the body, anxiety or agitation are all signs of heat stress.
- Constant pacing or jumping at the wire to either escape or attack something nearby.
- Wing flapping repetitively.
- Constant flight.

-Pet Birds  
-Pet Education.com

## **9.7 Behavioural Enrichment**

The Cape Barren Goose is a natural grazer, eating many types of plants in its natural environment. Considering it spends most of its daylight hours grazing (12 hours in summer, 6-7 hours in winter), providing edible vegetation in enriching ways can satisfy this natural Behaviour;

- Fresh natural grasses planted periodically into the aviary such as tussock grass will create a natural grazing environment for the Geese.
- Trees and shrubs that are edible can be used to provide an extra source of nutrition as well as shelter and ideal nest hide outs.
- Whole lettuces and leafy greens can be spiked in various hard to reach places so they have to reach to get their food.
- Scented oils or buried herbs for olfactory.
- Allowing the Geese to free range the park (by first clipping their wings– see section 11.10) is the ultimate behavioural enrichment. It allows them to experience a greater variety of all things enriching.
- Conditioning the goose is a form of cognitive enrichment

The Cape Barren Goose is a monogamous bird. In the wild it spends most of the year with its mate (they do group into flocks in the non-breeding season). To enrich this social behaviour, house in male / female pairs. Pair formation in the wild happens from age 12 to 24 months so this is the ideal time to introduce them.

Nesting and breeding is a big part of the wild Cape Barrens Goose's life. The pairs spend a good part of every year building a nest, protecting it, laying eggs, and raising the chicks. Even if you don't intend to hatch the goslings, swap them with fake eggs to promote this kind of behaviour for an excellent enrichment;

- Add nest building materials such as sticks and reeds to the enclosure, close to the breeding season
- Plant long grasses or shrubs- a protected spot for the Geese to build their nest.

-Handbook of Australian, Newzealand and Antarctic Birds

## **9.8 Introductions and Removals**

- Introducing a pair to each other is best done between 12 and 24 months of age. The history and bloodlines of both should be known to avoid interbreeding and promote good bloodlines.
- The Geese are very territorial and may attack each other. To lower the risk of this, release them both into a new enclosure at the same time.
- Allow them to interact through a fence prior to this. At this time you can assess how they will react to each other.
- If you are wishing to have more than a pair in the enclosure, the easiest way to do this is to put them in there while they are all still goslings. They will imprint on each other and form a bond.
- Family groups will live together well but you may have to separate them later to avoid interbreeding.
- When separating Cape Barren Geese, there is really no happy way to do it. If you put them in adjoining enclosures where they can see each other through the wire they will spend their time walking backwards and forwards trying to get to each other. Alternatively, you can separate them completely; they will pine and call for their sibling / mate. If this is the case, try to pair them up with another goose ASAP as this would be the best time to do it.

### **9.9 Intraspecific Compatibility**

- Intraspecific compatibility is very good. They enjoy the company of each other, especially when paired up, as they mate for life.
- Large groups of them can be housed together, but this may be possible for only part of the year as they become very territorial in the breeding season. This may not be a problem in a very large enclosure.

### **9.10 Interspecific Compatibility**

- This may or may not be a problem depending on the goose. The goose will always be the boss of the enclosure no matter whether it is housed with magpies or Red Deer.
- At Hunter Valley Zoo, the Cape Barren Goose is housed with Emus, Ostriches, Ducks, Geese, Russa Deer, Chittle Deer and Fallow Deer. He is head of the hierarchy, and all the other animals avoid him as he is sometimes aggressive.
- At the Australian Reptile park they will never let the Cape Barren Geese out to free range at the same time as the emus as the Cape Barren Goose will attack them.
- At Oakvale Farm the Cape Barren Goslings of two months old who are let out to free range for a day and cannot yet fly, have already been seen chasing magpies, goats and peacocks.
- I feel the Cape Barrens are suitable to house with other birds and mammals, depending on the animals. I would never put them with delicate animals that are easily stressed out, and I would be very wary of the breeding season if they are a pair. Also hand raised Cape Barren Geese are less aggressive towards other animals.

-Colen Stephanson, Hunter Valley Zoo

-Tim Faulkner, Australian Reptile Park



### **9.11 Suitability to Captivity**

- Cape Barren Geese are very suitable to captivity. They do well and are held in over 100 Zoos and Wildlife parks.
- They have no problems breeding in captivity and have adapted well to man.
- Many Geese live in a free range captive environment and choose not to fly away, living side by side with humans.

# 10 Breeding

## 10.1 Mating System

The Cape Barren Goose is monogamous. This means it will stay with its partner (or rejoin it every breeding season) for life. It is possible to separate the Geese to pretend the other has died so a new pairing can be made but this is very stressful on the Geese and is not guaranteed to work. For information on introducing a pair to each other see 9.8 introductions and removals.

## 10.2 Ease of Breeding

- The Geese have no problem breeding in captivity and will build a nest with whatever they can find, even in the open.
- They don't need much help at all. If you wish to provide triggers, just provide nest building material and a private area to build it. You may provide a nest box if you like but they are not guaranteed to use it.

## 10.3 Reproductive Condition

- Ample food available.
- Correct environmental conditions; summer and autumn not too dry.
- Nest building material available.
- Not housed with other animals if they are showing the aggressive behavior common to the species.

-Waterfowl in Australia

## 10.4 Techniques Used to Control Breeding

- Separation of pair– 100% success yet stressful on birds and may not give them quality of life.
- Egg swapping: once eggs are laid, swap them with fake ones. This allows the Geese to think they are incubating eggs which is enriching for them. However, it can be stressful when they 'lose' their eggs because they never hatch. Also hard on the female's body (she loses 20% of her body weight incubating).
- I do not recommend contraception or vasectomy for Geese.

## 10.5 Occurrence of Hybrids

Unknown, after extensive research there was no occurrence of hybrids found.

## 10.6 Timing of Breeding

- In winter, determined by the length of the day. May to August every year, occasionally October, November.
- If the Summer and Autumn are dry, nest building is delayed and restricted.

-Encyclopedia of Australian and NZ Waterfowl

-Waterfowl in Australia

## 10.7 Age at First Breeding and Last Breeding

Approx 3-4 years till 10 years in the wild, possibly longer for captivity.

- Greg Hocking department of primary industries

-Animal Bytes

## 10.8 Ability to Breed Every Year

Capable of breeding every year.



### **10.9 Ability to Breed More than Once Per Year**

They will double clutch if you remove their eggs or even their goslings

### **10.10 Nesting, Hollow or Other Requirements**

- Nest boxes could be trialed but given the size of the goose they should be constructed more like a kennel, and they are not guaranteed to use it.
- Alternatively, shrubs and tall tussock grass should be thick in a covered area of the aviary, giving the Geese a chance to build a natural nest with visual barriers as they do in the wild.
- In autumn (the nest building time), objects such as sticks, reeds, cut grass, straw, or hay could be offered into the enclosure as possible nest material.
- In the wild they tend to build their nests on the western side of the island exposed to the prevailing winds. They are often on rocky prominences with good visibility, yet beside tussock bushes and rocks. If you provide these things in your enclosure this is perfect nesting requirements.

### **10.11 Breeding Diet**

- See 6.2 (feeding) then add one cup of cracked corn (for extra winter fat)
- Also increase the vitamin and mineral supplement by one teaspoon or increase it by half a teaspoon and add a half a teaspoon of calcium. (this is for egg shell and bone strength. If your goose gets plenty of calcium in its diet the latter may not be needed)

### **10.12 Incubation Period**

34-37 days– all incubation is done by the female. She will spend 70% of her time on the nest after laying the first egg and will lose 20% of her body weight throughout the incubation.

-[Encyclopedia of Australian and NZ Waterfowl](#)

-[Waterfowl in Australia](#)

### **10.13 Clutch Size**

1-7 average 3-5 creamy white eggs

-[Encyclopedia of Australian and NZ Waterfowl](#)

-[Waterfowl in Australia](#)

### **10.14 Age at Fledging**

- The compiler's two hand raised goslings at Oakvale Farm and Fauna World fledged at three months
- 70-76 days

-[Encyclopedia of Australian and NZ Waterfowl](#)

### **10.15 Age of Removal from Parents**

- In the wild the Goslings stay with their parents for up to 16 weeks. If your captive parents and Goslings are in good health, and the parents are doing a good job, there should be no reason to remove the goslings before 16 weeks.
- If you are worried about the health of the goslings and choose to remove them early, its important to put a duck (or any larger fowl) for them to imprint off, especially if there is only one or two. If there is five or more this is not important.
- Be aware that removing the Goslings from the parents too early may cause the parents to double clutch.

-[Does post hatching size limit clutch size...](#)

-[Encyclopedia of Australian and NZ Waterfowl](#)

## 10.16 Growth and Development Table

| Development table  | Dates                          |
|--------------------|--------------------------------|
| Incubation time    | 34-37 days                     |
| Hatch days         | Day 34-37                      |
| Hatching weight    | 70-95g                         |
| Contour feathers   | Appear day 15– complete day 59 |
| Wing converts      | By 31 days                     |
| Secondary feathers | By 31 days                     |
| Primary feathers   | On 31 days                     |
| Leg band age       | 4-6 weeks                      |
| Fledging age       | 70-76 days                     |
| Fledging weight    | 3.6-4.5kg (80% adult weight)   |
| Adult weight       | Aprox 3.12-6.8kg               |
| Independence age   | 16 weeks                       |
| Growth complete    | 2-3 years old                  |
| Sexual maturity    | Aprox 2-3 years                |



Above 28 days, Below 39 days



-Encyclopedia of Australian and NZ Waterfowl  
 -Geese Identification  
 -Animal Bytes



Above and  
 Left . 49 days  
 pink on legs  
 And yellow  
 On cere  
 Developing.  
 Feet still  
 Grey.

Right  
 137 days (19 weeks)  
 Pink legs developed,  
 Grey feet now black,  
 Cere now yellow.



# 11 Artificial Rearing

## 11.1 Incubator Type

### Still air Incubators

- Extremely sensitive to surrounding conditions and need to be kept where temperatures are not likely to fluctuate. A constant room temperature of 21°C is recommended.
- They come in various small sizes so are cheaper than the large fan forced incubators.
- The Cape Barren Goose egg is quite large and will not hatch successfully in some still air incubators due to uneven heating when some parts of the egg are closer to the heat coil than others.

### Fan-Forced Incubator

- Circulation of the air by the fan causes an even temperature throughout.
- Generally they are larger in capacity holding from several dozen to several thousand. So they are quite expensive.
- Subterranean storage areas are ideal for storage though these are not as susceptible to surrounding temperatures as the still air.
- Both of these incubators will either be a hand turn or auto turn incubator. Hand turning requires time and the temperature of the incubator may change while it is open. A pencil line needs to be drawn on the eggs so you can monitor the turning. Auto turning incubators are more expensive but require less resources / time.
- If you have a clucky chicken (or even better– duck) that you know is a good mother, there is another option of putting the eggs under them and using them as the incubator and even to imprint them with when they hatch.

-Ducks and Geese in your Backyard

## 11.2 Incubation Temperatures and Humidity

- Still air incubators temperature: 38.3°C
- Fan Forced incubators temperatures: 37.4°C
- If the incubator does not come with a thermometer purchase one and monitor it daily to ensure the incubator has not malfunctioned.
- In a still air incubator ensure the thermometer is at the same height / area as the eggs to get an accurate reading (level with the top of the eggs).
- Humidity can be measured by a thermometer / hygrometer through a wet bulb reading or other.
- Humidity should be kept at 75% for the Goose, through use of a water bowl, a light misting with distilled water from the fourteenth day onwards. Be sure not to use cool water as this may alter the incubator temperature.

-Ducks and Geese in your Backyard

## 11.3 Desired % Egg Mass Loss

Between 7.8% and 14.4%, Based on wild studies done on nesting Cape Barren Geese.

-Nesting Climate and behavior of the Cape Barren Goose

### **11.4 Hatching Temperature and Humidity**

- High humidity at hatching is obligatory.
- The humidity needs to be 80% relative.
- Fan forced air temperature needs to be 36.9°C.
- Still air temperature needs to be 39.2°C.

-Ducks and Geese in Your Backyard

### **11.5 Normal Pip to Hatch Interval**

- 48-72 hours

### **11.6 Brooder Types/ Design**

- In the wild the mother broods them nightly until they are about 4 weeks old.
- Remember to thoroughly disinfect the brooder for traces of previous use.
- Brooders can range from the elaborate designs you find at poultry suppliers to a simple cardboard box with a light globe providing the heat.
- The cardboard box is easier to clean as you just provide a new box, however the open top of the box needs to be secured with wire mesh to prevent escapes or attacks and needs to be partially covered with newspapers to stop cool drafts.
- If you intend on hand raising birds on a regular basis a permanent brooder would be more satisfactory in the long run.
- Brooders completely made of metal with wire mesh floors and dropping trays are ideal and easy to clean. Be aware of the height of the brooder, as if it is made for chickens the goslings may grow out of it rapidly.
- A room with a concrete floor and powerpoint can be transformed into a brooder by installing the appropriate light globes. Note that concrete floors are harder to clean, and if a substrate is used to assist, then ensure it is non-flammable.
- Multi level brooders known as batteries, are not suitable for waterfowl (unless only the bottom level is used for them) due to the large amount of fluid droppings they produce.
- If you are having difficulty keeping up with the amount of droppings in the tray you may wish to elevate your brooder over a thick layer of litter on the floor.
- If you used a foster mum as an incubator use her as the brooder also.



**Two Day old Goslings in a Metal Chicken Brooder**

-Ducks and Geese in Your Backyard

-Encyclopedia of Australian wildlife

### **11.7 Brooder Temperatures**

Manuals for waterfowl generally state that brooder temperatures should start at 32°C and should be decreased about 3°C per week until 21°C is reached around the fifth week where heat is no longer required. (because the birds have grown some heat-retaining plumage).

-Ducks and Geese in Your Backyard



### **11.8 Diet and Feeding Routine**

- The Goslings need as much leafy greens as they can eat from the very start. A constant supply needs to be provided. They will eat huge amounts of it, even more than their parents (see section 6 Feeding requirements for selection of greens). If feeding cut grass be sure to tie it tightly to something so they can pick at the tips rather than swallowing whole portions.
- Turkey starter should never be fed as it is too high in protein. If chicken starter is used it must be mixed with other foodstuff and not be fed after two weeks, as this is also too high in protein for the goose's growth.
- Apart from this, the diet of the parents can be fed. Monitor the size of the ingredients. Alfalfa pellets or wheat may have to be crushed if they are leaving it behind because it's too large to eat. You could also swap cracked corn for crushed corn. Supply the Goslings with a half supply of what the parents receive although they will eat less and pick at certain things.
- Feed dry feed once daily and leafy greens three times daily. Supplement twice a week with two half tea spoons sprinkled on food (see section 6 for supplements).

-Ducks and Geese in Your Backyard

### **11.9 Specific Requirements**

The Goslings do not require anything specific when hand raising. The only difference to a domestic duck or goose is they do not require a pond to swim in.

### **11.10 Pinioning Requirements**

- Pinioning is rendering the Cape Barren Goose flightless by clipping off the last joint on one of its wings with a sharp pair of shears. It is best done in the first few days after hatch, as little blood is lost at this age.
- I do not recommend pinioning in this industry as the Cape Barren Goose is not always kept free range or in an open aviary. For the geese kept in aviaries, allowing them to fly is great enrichment and good for their health.
- If the goose is kept free range a less permanent method of rendering it flightless is wing clipping. This is a good idea considering the goose may be sold or moved to an aviary at some stage.

-Methods of restricting a birds flight

**Wing clipping;** See Diagram right

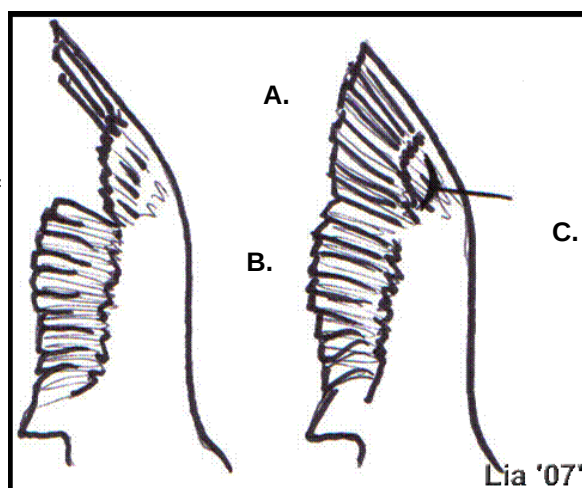
- A. Primary Feathers.
- B. Secondary Feathers.
- C. Primary coverts.

You only need to clip one wing to keep the bird grounded. Using sharp scissors cut off 8 of the 10 primary feathers just under the primary coverts.

Leave the secondary feathers intact to maintain a natural appearance. Leave the two outer primaries intact to maintain equal wing points when the wings are folded. When you do this it is only possible to tell the wing is clipped if the goose opens it.

You will need to clip their wings once a year, when they molt (in October or just after they finish their breeding season) then grow back new primaries. Observe the goose's molt and new growth. Clip their wings just prior to the completion of new primary feather growth.

-Wing Clipping (waterfowl)





### **11.11 Data Recording**

- **Identification:** This includes species, name, sex, band numbers, cage identification, microchip numbers, and any unusual identifying features or marks on the bird.
- **Parentage:** Any available information on the birds parents.
- **Current environment:** How the bird is housed, where the cage is located, current diet, any other animals in the environment, what type of water the bird is drinking, what types of disinfectants you are using, general husbandry practices, weather conditions.
- **Observations:** The bird's temperament and behavior patterns, any unusual activity, condition of droppings, any changes in colour of cere and legs, changes in diet, behavioural problems and any recent exposure to unusual circumstances or environmental factors such as stress and chemicals.  

*-The National Cockatiel Society*
- **Size and Weight measurements:** Record date of measurements, height, cere to tail, wingspan, and weight. Also changes in feather colour, when they pin feather, and any other notable changes.

### **11.12 Identification Methods**

- If you are incubating the goslings with other eggs of different parentage, it is important to keep track of which is which. Write on the eggs with a soft pencil any information you need for your record keeping.
- When the goslings hatch there are two Identification techniques that are appropriate:
  1. Food colouring or vegetable dye on their backs or necks (for the short term only as it may wash off if they go for a swim and they do exchange their down feathers quite rapidly).
  2. Band the goslings with temporary bands or leg spirals (until they are old / large enough to get their official identification) see 5.3 Methods of Identification.

*-Ducks and Geese in Your Backyard*

### **11.13 Hygiene**

- Always wash hands with disinfectant before and after handling.
- Disinfect the brooder (or environment) they are in, also the food/ water container).
- Replace any substrates when they become soiled (use a face mask when doing so).
- Generally keep them in a clean, vermin free environment.

### **11.14 Behavioral Considerations**

- Cape Barren Goose goslings need something to imprint on. If there are less than five of them, there will be social problems apparent if they are left to themselves. Provide them with an older bird (preferably waterfowl) for the first eight weeks. This will allow them to learn how and what to eat and develop social skills.
- The goslings will not attack a human like their parents are capable of. There is no physical OHS risk to the keeper handling them.
- Take time to hand feed the goslings through all stages of development. This will condition them to human handling, which will be useful when they become adults.

- Do not over handle the goslings. Let them imprint on another bird, not a human. They are precocial though so they don't tend to look to humans as their parents; they stick together.

### ***11.15 Use of Foster Species***

- This can work very well provided the foster species has a similar diet to the goslings (as they learn what and how to eat in their first few days). A herbivorous waterfowl is recommended.
- The goslings will develop their natural behaviours by themselves. The triumph ceremony and vocalisation is apparent from a young age.
- Use of a foster species is enriching for both the foster species and the goslings.
- Only use when parent rearing is unsuitable for them. Parent rearing is preferable for both the parents and the goslings. It promotes the natural life in the wild.

### ***11.16 Weaning***

- As the Cape Barren Goose is born precocial it eats for itself from the start and does not need to be weaned at any time.

### ***11.17 Rehabilitation Procedures***

- If the goslings are injured, treat specific to the injury. For information on how to treat for shock, oil immersion, cuts, convulsions, fractures, burns, smoke inhalation, heat stroke, and poisoning see **Appendix (10)**
- Keep goslings together.
- Gradually move them in with other species as appropriate with recovery.
- If found injured from the wild, prepare them to be released after rehabilitation by putting them in a naturalistic environment with natural food and little keeper contact.

-The Bird Care Book



## 12 Acknowledgements

**Colen Stevenson** owner

Hunter Valley Zoo

Lot 21 Lomas

Cessnock, NSW, 2325

02-49907714

For information on diets of the Cape Barren Geese at Hunter Valley zoo.

**Ellissa Smith**

Captive Animals Cert 111 Teacher

Western Sydney Institute of TAFE (Richmond)

Blacktown RD

Richmond, NSW, 2753

Ph) 02-40759023

For feedback on husbandry manual sections as they were compiled.

**Graeme Phipps**

Captive Animals Cert 111 Head Teacher

Western Sydney Institute of TAFE (Richmond)

Blacktown RD

Richmond, NSW, 2753

Ph) 02-40759023

For continued assistance and feed back through the whole process.

**Greg Hocking.** Manager- Policy and Planning

Wildlife Management Branch Department of Primary Industries, Water & Environment

GPO Box 44,

Hobart, TAS, 7001

Telephone 03-62336751

Mobile 0408 177 830

Fax 03-62333477

For continued assistance, advice, and banding research information on longevity in the wild and breeding ages.

**Jacki Salkeld**

Captive Animals Cert 111 Teacher

Western Sydney Institute of TAFE (Richmond)

Blacktown RD

Richmond, NSW, 2753

Ph) 02-40759023

For feed back on husbandry manual sections as they were compiled.

**Kent Sansom** owner/ manager  
Oakvale Farm and Fauna World  
RMB 2828 Nelson Bay Rd  
Salt Ash, NSW, 2318  
Ph) 02-49826222

For continued support and allowing full access to the Cape Barren Geese at Oakvale Farm and Fauna World.

**Tim Faulkner**, curator of Birds and Mammals  
Australian Reptile Park  
Pacific HWY Summersby  
PO box 737

Gostford NSW 2250

For information on the diets and enrichment at the Australian Reptile Park.

# 13 References

## **A Manual of Poultry Diseases**

B.S. Baines

{Roche}, Basle 1979

## **A world or pet care, heart worm prevention**

<http://brunswickvet.com.au>

## **ABBBS, Recommended band size list, 2000**

<http://www.deh.gov.au/biodiversity/science/abbbs/>

## **Angel Wing in Waterfowl. Wild life information- diseases**

[http://www.wildlifeinformation.org/Subdirectories\\_for\\_Search2/SampleDiseases/Angel\\_Wing.htm](http://www.wildlifeinformation.org/Subdirectories_for_Search2/SampleDiseases/Angel_Wing.htm)

## **Animal Diversity web Family- Anatidae**

<http://animaldiversity.ummz.umich.edu/site/accounts/information/Anatidae.html>

## **Animal Health Australia**

<http://www.animalhealthaustralia.com.au>

## **Anthrax facts Biosecurity updates from the AVMA**

[http://www.avma.org/public\\_health/biosecurity/anthrax\\_facts.asp#signs](http://www.avma.org/public_health/biosecurity/anthrax_facts.asp#signs)

## **Australian Faunal Directory: Checklist for *Cereopsis novaehollandiae grisea* (Vieillot, 1818)**

<http://www.deh.gov.au/cgi-bin/abrs/fauna/tree.pl?pstrVol=AVES;pintTaxa=1671;pintMode=2#1671>

## **Australian birds their nests and their eggs-**

Gordon Beruldsen

published by G.Beruldsen 2003

## **Australian Government, department of agriculture fisheries and forestry Pests and diseases**

<http://www.affa.gov.au/content/output.cfm?ObjectID=D7A08354-52B3-4CFC-AEEA99C268C4DC7E&contType=outputs>

## **Australian Government Department for the Environment and heritage. Australian biological resources study**

<http://www.deh.gov.au/cgi-bin/abrs/fauna/details.pl?pstrVol=AVES;pstrTaxa=1671;pstrChecklistMode=2#taxonomy>

## **Australian Government Department of the Environment and Heritage EPBC act status.**

[http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=981#EPBC%20Act%20Status](http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=981#EPBC%20Act%20Status)

## **Australian Government. Department for Environment and heritage**

Species profile and threats data base

[http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=25978](http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=25978)

## **Australian Reptile Park Cape Barren Goose page**

<http://www.reptilepark.com.au/animals.asp?catID=1&ID=18>

## **Avian Chlamydiosis (Psittacosis)**

<http://www.internationalparrotletsociety.org/psittacosis.html>

## **Avian Nutrition by Cynthia L. Kiesewetter**

<http://www.cockatiel.org/articles/nutrition.html>



**Binder Park Zoo.** Untitled Cape Barren info.

[http://www.binderparkzoo.org/Finished%20pages/animal\\_pages/pages/c\\_b\\_goose.htm](http://www.binderparkzoo.org/Finished%20pages/animal_pages/pages/c_b_goose.htm)

**Birddata:** By Birds Australia and Wildlifelink

[http://www.birddata.com.au/map\\_top.html](http://www.birddata.com.au/map_top.html)

### **Birds 2000**

The KVF Jubb Refresher Course for Veterinarians  
Published Post graduate foundation in veterinary science,  
Univerity of Sydney 2000

### **Bird vet, why microchip birds**

<http://www.birdvet.com.au/birdcare/Bird%20Facts%2038%20microchipping%20birds.htm>

**Bumblefoot** with special reference to waterfowl, Debera Bourne

[http://www.wildlifeinformation.org/Subdirectories\\_for\\_Search2/SampleDiseases/Bumblefoot.htm](http://www.wildlifeinformation.org/Subdirectories_for_Search2/SampleDiseases/Bumblefoot.htm)

**CCAC Canadian Council Animal Care, waterfowl.**

[http://www.ccac.ca/en/CCAC\\_Programs/Guidelines\\_Policies/GUIDES/ENGLISH/V2\\_84/CHV.HTM](http://www.ccac.ca/en/CCAC_Programs/Guidelines_Policies/GUIDES/ENGLISH/V2_84/CHV.HTM)

Chemical Essentials Pty Ltd on 03 9841 9901

[chemicalessentials@bigpond.com](mailto:chemicalessentials@bigpond.com)

**Colen Stevenson** owner

Hunter Valley Zoo NSW

Dictionary .com– online dictionary

<http://dictionary.reference.com/>

**DISEASES OF WILDLIFE** , AFIP REVIEW OF GROSS MORBID ANATOMY OF ANIMALS, C.L.,  
DAVIS, DVM FOUNDATION, WASHINGTON, DC, MARCH 22, 1999, John R. Fischer, Southeast-  
ern, Cooperative Wildlife Disease Study, College of Veterinary Medicine, The University of Georgia  
Athens, GA 30602

<http://www.afip.org/CLDavis/GrossCourse99/Wildlife.htm>

### **Do Post-Hatching Factors Limit Clutch Size**

**in the Cape Barren Goose,**

***Cereopsis novaehollandiae* Latham**

Sergio M. Pellis and Vivien C. Pellis

Department of Zoology, Monash University, Clayton, Vic. 3168.

### **Ducks and Geese in your backyard**

Rick and Gail Luttmann

Rodale Press Emmaus, Pa 1978

### **Eutech Instruments Pte Ltd.**

Last updated on 29 Jan 2004. Copyright © 1997

<http://www.eutechinst.com/techtips/msds.htm>

**Exhibited Animals Protection act.** General standards for exhibiting animals in NSW

[EAPA \(Exhibited Animals Protection Act, Dept Primary Industries\)](#)

**Fatal Encephalitis and Myocarditis in Young Domestic Geese (*Anser anser domesticus*)** Caused  
by West Nile

<http://www.cdc.gov/ncidod/eid/vol7no4/swayne.htm>

**FAO corporate document repository Goose production France** chapter 14 goose diseases

<http://www.fao.org/DOCREP/005/Y4359E/y4359e0g.htm>

**Favourite Australian Birds**, compiled by Louise Egerton, writers; David Butcher, Andrew Detre, Guen Jacobsen, Greg Keith, Peter McDonald, Chris Mobbs, Penny and Gerry Olsen, Ruth Smith and Mary-Jo Wilson  
BAY BOOKS 1993

**Food and Feeding for Birds by Debra Bourne**

[http://www.wildlifeinformation.org/Subdirectories\\_for\\_Search2/SampleTechs/FeedingRegimens.htm](http://www.wildlifeinformation.org/Subdirectories_for_Search2/SampleTechs/FeedingRegimens.htm)

**Field Manual of wildlife diseases- Birds. Chapter 31 diseases of swans and Geese**

[http://www.nwhc.usgs.gov/publications/field\\_manual/chapter\\_31.pdf](http://www.nwhc.usgs.gov/publications/field_manual/chapter_31.pdf)

**Geoff Higgins and Dalys Newman, Australia's birds** Moondrake 1998

**Greg Hocking.** Manager- Policy and Planning

Wildlife Management Branch Department of Primary Industries, Water & Environment

GPO Box 44, Hobart, 7001

Telephone 03-62336751

Mobile 0408 177 830

Fax 03-62333477

**Hand Book of Australian, New Zealand & Antarctic Birds**

S. Marchant & P.J. Higgins

Volume 1, Part A, Ratites to Petrels

Melbourne Oxford University Press

**Health Exam for Birds**

By The Association of Avian Veterinarians

<http://www.santaclarapethospital.com/764133.html>

**Helminth infections with organic vet.**

<http://www.organic-vet.reading.ac.uk/Poultryweb/disease/helm/helm.htm>

**Highly Pathogenic Avian Influenza** February 2002 Veterinary Services

<http://www.internationalparrotletsociety.org/avianin.html>

**How to catch and take blood from birds and lizards**

<http://www.uvm.edu/~jschall/pdfs/techniques/catchingbirdslizards.pdf>

**IATA Live Animal Regulations**

25 edition effective October 1st 1998

**IATA Live Animal Regulations**

33rd Edition, effective October 1st 2006

Phone +1(800)71 66 32 60

**ISIS International Species Information System**

<http://www.zsl.org/discovery-learning//the-modern-zoo/animal-records,358.AR.html>

**IUCN The World Conservation Union** Cape Barren Goose (south-western) recovery outline

<http://www.birdsaustralia.com.au/actionplan/vulnerable.html>

**Jackson, S.M. (2002)** *Standardizing captive-management manuals: guidelines for terrestrial vertebrates* revised, in International Zoo Yearbook (2003) 38: 229-243, The Zoological Society of London, London.

**J.D.Macdonald, birds of Australia**, A Summary of Information, a Reed Book 1973

**Lists of agents associated with disease in waterfowl**

[http://www.wildlifeinformation.org/Subdirectories\\_for\\_Search2/listpages/waterfowl/List\\_WaterfowlAgents.htm#Viral](http://www.wildlifeinformation.org/Subdirectories_for_Search2/listpages/waterfowl/List_WaterfowlAgents.htm#Viral)

### **Live Animal Capture and Handling Guidelines**

for Wild Mammals, Birds, Amphibians & Reptiles

Prepared by

Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee

December 4, 1998 Version 2.0

<http://ilmbwww.gov.bc.ca/risc/pubs/tebiodiv/capt/captml20-08.htm>

### **Longevity Records: Life Spans of Mammals, Birds, Amphibians, Reptiles, and Fish**

<http://www.demogr.mpg.de/cgi-bin/longevityrecords/indexsearch.plx?category=1&data=1583>

Methods of restricting a Birds flight Graciously Provided by Micheal Baker. Swan Haven Waterfowl Wills Point, Tx

<http://www.poultryconnection.com/quackers/clip-3.html>

Metazoan Parasites chapter 8

<http://compepid.tuskegee.edu/syllabi/pathobiology/pathology/avianmed/chapter8.html>

### **Michael Morcombe Field Guide to Australian Birds**

Steve Parish Publishing 2000

### **Microbe Wiki; Sarcocystis**

<http://microbewiki.kenyon.edu/mediawiki-1.6.6/index.php/Sarcocystis>

### **National Parks and Wildlife Services for each state**

**New South Wales** [www.nationalparks.nsw.gov.au](http://www.nationalparks.nsw.gov.au)

**Australian Capital Territory** <http://www.environment.act.gov.au/>

**Northern Territory** <http://www.nt.gov.au/nreta/parks/>

**Queensland** <http://www.epa.qld.gov.au/>

**South Australia** <http://www.environment.sa.gov.au/>

**Tasmania** <http://www.dpiw.tas.gov.au/inter.nsf/Home/1?Open>

**Victoria** <http://www.nre.vic.gov.au/>

**Western Australia** <http://www.calm.wa.gov.au/>

### **Nesting Climate and Behaviour of Cape Barren Geese (*Cereopsis novaehollandiae* Latham)**

Kerstin Wagner and Roger S. Seymour

Department of Environmental Biology, University of Adelaide

Australian Journal of Zoology 49(2)155-170

**Petalia.com**, a world of pet care. Avitrol Plus Worming Syrup

[http://www.petalia.com.au/templates/prodSubList.cfm?group\\_no=2103&specie=Birds](http://www.petalia.com.au/templates/prodSubList.cfm?group_no=2103&specie=Birds)

**Pet Birds.** Stress the Silent Killer

<http://pet-birds.yourinfopalace.com/stress---the-silent-killer.html>

**Pet Education.com** Dr Foster's and Smith's source to excellent pet information Holiday safety tips for your bird

<http://www.peteducation.com/article.cfm?cls=15&cat=1912&articleid=3030>

### **QUARANTINE AND HEALTH SCREENING PROTOCOLS FOR WILDLIFE**

PRIOR TO TRANSLOCATION AND RELEASE INTO THE WILD

Compiled and Edited by Michael H. Woodford, Dr. vet. med., FRCVS

Published jointly by the IUCN Species Survival Commission's Veterinary Specialist Group, Gland, Switzerland, the Office International des Epizooties (OIE), Paris, France, Care for the Wild, U.K., and the European Association of Zoo and Wildlife Veterinarians, Switzerland.

### **Quarantine australia state to state transfers**

Ph; 1800084881

**Readers Digest, encyclopedia of Australian wildlife**, 1997 Readers Digest

Reference. Com  
<http://www.reference.com/>

**Simpson and Day, Field Guide to the birds of Australia** 6<sup>th</sup> edition Penguin books Australia 1989

**Standing comity for the European convention of the protection of animals**

June 22 1999 Recommendation concerning domestic ducks

<http://www.mapa.es/ganaderia/pags/bienestar/pdf/recpatoingles.pdf>

**The Bird Care Book**

Sheldon L. Gerstenfeld, V.M.D

Persues Books 1978

**The code of practice for the welfare of captive birds in the ATC**

[www.environment.act.gov.au](http://www.environment.act.gov.au)

**The Handling and Storage of Birds**

<http://web.uct.ac.za/depts/stats/adu/pdf/ring-manual-03.pdf>

**The Importation Of Non-Viable Eggs And Products Containing Egg** Technical Issues Paper,  
December 2000

[http://www.affa.gov.au/corporate\\_docs/publications/pdf/market\\_access/biosecurity/animal/2001/2001-01a.pdf](http://www.affa.gov.au/corporate_docs/publications/pdf/market_access/biosecurity/animal/2001/2001-01a.pdf)

**The IUCN Red List of Threatened Species** data base

<http://www.iucnredlist.org/search/search-basic>

**The code of practice for the welfare of captive birds in the ATC**

[www.environment.act.gov.au](http://www.environment.act.gov.au)

**The Merck Veterinary Manual**

<http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/91600.htm>

**The National Cockatiel Society. A Practical Guide to Disinfection in the Aviary and Home** by Dave  
McCluggage, DVM

<http://www.cockatiels.org/articles/vet/disinfection.html>

**The New Duck Handbook**

Raethel, Heinz-Singurd

Barrens Educational Series 1988

**The new incubation book**

Dr A.F. Anderson brown and G.E.S. Robbins

Hancock house Punblishers 2002

**The Poultry Site** Quick Disease Guide

<http://www.thepoultrysite.com/diseaseinfo/Default.asp>

**The Shape of Enrichment volume 8 no 4 november 1999** Bird Enrichment Taking Flight by C.

Sandos, aviary keeper, North Caroliner Zoological Park

[www.torontozoo.com/meet\\_animals/enrichment/Files/Bird%20Enrichment.pdf](http://www.torontozoo.com/meet_animals/enrichment/Files/Bird%20Enrichment.pdf)

**Tim Faulkner**, curator of Birds and Mammals

Australian Reptile Park NSW

**Victorian government health information**, Infectious Disease

<http://www.health.vic.gov.au/ideas/bluebook/yersiniosis.htm>

Waterfowl in Australia  
H.J. Frith, Chief division Of Wildlife Research CSIRO  
REED 1967

**West Nile Virus** a reemerging global pathogen  
<http://www.highbeam.com/library/docFree.asp?DOCID=1G1:78167813>

**Wikipedia**, the free encyclopedia, Cape Barren Goose  
[http://en.wikipedia.org/wiki/Cape\\_Barren\\_Goose](http://en.wikipedia.org/wiki/Cape_Barren_Goose)

**Wing Clipping (waterfowl)** Cornerstone Farm 525 Barnes Rd Red Oak, Virginia 23964  
<http://www.cornerstonefarm.net/wingdemo.html>

Zoological Society of London ZSL  
<http://www.zsl.org/discovery-learning//the-modern-zoo/animal-records,358,AR.html>



# 14 Bibliography

## **A Manual of Poultry Diseases**

B.S. Baines

{Roche}, Basle 1979

**A world or pet care**, heart worm prevention

<http://brunswickvet.com.au>

**ABBBS, Recommended band size list, 2000**

<http://www.deh.gov.au/biodiversity/science/abbbs/>

**Angel Wing in Waterfowl**. Wild life information- diseases

[http://www.wildlifeinformation.org/Subdirectories\\_for\\_Search2/SampleDiseases/Angel\\_Wing.htm](http://www.wildlifeinformation.org/Subdirectories_for_Search2/SampleDiseases/Angel_Wing.htm)

**Animal Bytes– the Cape Barren Goose**

<http://www.seaworld.org/animal-info/animal-bytes/animalia/eumetazoa/coelomates/deuterostomes/chordata/craniata/aves/anseriformes/cape-barren-goose.htm>

**Animal Diversity web** Family- Anatidae

<http://animaldiversity.ummz.umich.edu/site/accounts/information/Anatidae.html>

**Animal Health Australia**

<http://www.animalhealthaustralia.com.au>

Answers.com, information from answers– cape barren goose

<http://www.answers.com/topic/cape-barren-goose>

**Anthrax facts Biosecurity updates from the AVMA**

[http://www.avma.org/public\\_health/biosecurity/anthrax\\_facts.asp#signs](http://www.avma.org/public_health/biosecurity/anthrax_facts.asp#signs)

Australian Animals– The Cape Barren Goose

<http://www.deregular.com/animals/australian-animals/Cape-Barren-Goose.php>

**Australian Faunal Directory**: Checklist for *Cereopsis novaehollandiae grisea* (Vieillot, 1818)

<http://www.deh.gov.au/cgi-bin/abrs/fauna/tree.pl?pstrVol=AVES;pintTaxa=1671;pintMode=2#1671>

**Australian Fauna .COM**

<http://www.australianfauna.com/capebarrengoose.php>

**Australian birds their nests and their eggs-**

Gordon Beruldsen

published by G.Beruldsen 2003

**Australian Government**, department of agriculture fisheries and forestry Pests and diseases

<http://www.affa.gov.au/content/output.cfm?ObjectID=D7A08354-52B3-4CFC-AEEA99C268C4DC7E&contType=outputs>

**Australian Government** Department for the Environment and heritage. Australian biological resources study

<http://www.deh.gov.au/cgi-bin/abrs/fauna/details.pl?pstrVol=AVES;pstrTaxa=1671;pstrChecklistMode=2#taxonomy>

**Australian Government** Department of the Environment and Heritage EPBC act status.

[http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=981#EPBC%20Act%20Status](http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=981#EPBC%20Act%20Status)

**Australian Government**. Department for Environment and heritage

Species profile and threats data base

[http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id=25978](http://www.deh.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=25978)

**Australian Reptile Park Cape Barren Goose page**  
<http://www.reptilepark.com.au/animals.asp?catID=1&ID=18>

**Avian Chlamydiosis (Psittacosis)**  
<http://www.internationalparrotletsociety.org/psittacosis.html>

**Avian Nutrition** by Cynthia L. Kieseewetter  
<http://www.cockatiel.org/articles/nutrition.html>

**Avian Salmonellosis.** Alberta sustainable resource development, fish and wildlife march 2004  
[http://www.srd.gov.ab.ca/fw/diseases/factsheet/Avian\\_salm.pdf#search=%22Avian%20Salmonellosis%22](http://www.srd.gov.ab.ca/fw/diseases/factsheet/Avian_salm.pdf#search=%22Avian%20Salmonellosis%22)

**Avian Tuberculosis: The Disease and Its Management**  
By Darrel K. Styles, MS, DVM  
<http://www.internationalparrotletsociety.org/aviantb.html>

**Birds In Backyards– Cape Barren Goose**  
<http://birdsinyard.net/finder/display.cfm?id=208>

**Cape Barren Goose *Cereopsis novaehollandiae***  
<http://www.arthurgrosset.com/ozbirds/capebarrengoose.html>

Chemical Essentials Pty Ltd on 03 9841 9901  
[chemicalessentials@bigpond.com](mailto:chemicalessentials@bigpond.com)

**Cincinnati Zoo and Botanical Garden**  
<http://www.cincyzo.org/Exhibits/AnimalExhibits/PenguinWalkabout/capebarrengoose/capebarren.html>

**East coast Nature World, Bicheno, Tasmania, Australia**  
[http://www.natureworld.com.au/Smile\\_At\\_The\\_Birds/Other\\_Native\\_Birds/other\\_native\\_birds.html](http://www.natureworld.com.au/Smile_At_The_Birds/Other_Native_Birds/other_native_birds.html)

**Eutech Instruments Pte Ltd.**  
Last updated on 29 Jan 2004. Copyright © 1997  
<http://www.eutechinst.com/techtips/msds.htm>

**Featherdale Wildlife Park– the Cape Barren Goose**  
<http://www.featherdale.com.au/featherdale/featherdale.ns4/Animals/Cape+Barren+Goose>

**Gippsland Vegetation Types: Ecological Vegetation Classes (EVC's)**  
EVC 163 Coastal Tussock Grassland  
[www.dpi.vic.gov.au/.../\\$FILE/EVC%20163%20%20Coastal%20Tussock%20Grassland.pdf](http://www.dpi.vic.gov.au/.../$FILE/EVC%20163%20%20Coastal%20Tussock%20Grassland.pdf)

**Greg Hocking.** Manager- Policy and Planning  
Wildlife Management Branch Department of Primary Industries, Water & Environment  
GPO Box 44, Hobart, 7001  
Telephone 03-62336751  
Mobile 0408 177 830  
Fax 03-62333477

**Hand Book of Australian, New Zealand & Antarctic Birds**  
S. Marchant & P.J. Higgins  
Volume 1, Part A, Ratites to Petrels  
Melbourne Oxford University Press

**Health Exam for Birds**  
By The Association of Avian Veterinarians  
<http://www.santaclarapethospital.com/764133.html>

**Helminth infections with organic vet.**  
<http://www.organic-vet.reading.ac.uk/Poultryweb/disease/helm/helm.htm>

**Highly Pathogenic Avian Influenza** February 2002 Veterinary Services  
<http://www.internationalparrotletsociety.org/avianin.html>

**How to catch and take blood from birds and lizards**  
<http://www.uvm.edu/~jschall/pdfs/techniques/catchingbirdslizards.pdf>

**IATA Live Animal Regulations**  
33rd Edition, effective October 1st 2006  
Phone +1(800)71 66 32 60

ISIS International Species Information System  
<http://www.zsl.org/discovery-learning//the-modern-zoo/animal-records,358,AR.html>

**IUCN The World Conservation Union** Cape Barren Goose (south-western) recovery outline  
<http://www.birdsaustralia.com.au/actionplan/vulnerable.html>

**Jackson, S.M. (2002)** *Standardizing captive-management manuals: guidelines for terrestrial vertebrates* revised, in International Zoo Yearbook (2003) 38: 229-243, The Zoological Society of London, London.

**J.D.Macdonald, birds of Australia**, A Summary of Information, a Reed Book 1973

**Lists of agents associated with disease in waterfowl**  
[http://www.wildlifeinformation.org/Subdirectories\\_for\\_Search2/listpages/waterfowl/List\\_WaterfowlAgents.htm#Viral](http://www.wildlifeinformation.org/Subdirectories_for_Search2/listpages/waterfowl/List_WaterfowlAgents.htm#Viral)

**Live Animal Capture and Handling Guidelines**  
for Wild Mammals, Birds, Amphibians & Reptiles  
Prepared by  
Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystems Task Force Resources Inventory Committee  
December 4, 1998 Version 2.0  
<http://ilmbwww.gov.bc.ca/risc/pubs/tebiodiv/capt/captml20-08.htm>

**Longevity Records:** Life Spans of Mammals, Birds, Amphibians, Reptiles, and Fish  
<http://www.demogr.mpg.de/cgi-bin/longevityrecords/indexsearch.plx?category=1&data=1583>

**Methods of restricting a Birds flight** Graciously Provided by Micheal Baker. Swan Haven Waterfowl Wills Point, Tx  
<http://www.poultryconnection.com/quackers/clip-3.html>

Metazoan Parasites chapter 8  
<http://compepid.tuskegee.edu/syllabi/pathobiology/pathology/avianmed/chapter8.html>

**Michael Morcombe Field Guide to Australian Birds**  
Steve Parish Publishing 2000

**Microbe Wiki; Sarcocystis**  
<http://microbewiki.kenyon.edu/mediawiki-1.6.6/index.php/Sarcocystis>

**monocotyledons**  
[www.dpiwe.tas.gov.au/inter.nsf/Attachments/LJEM-5UA84Y/\\$FILE/second%20part%20of%20Bruny%20Island%20Plan.pdf](http://www.dpiwe.tas.gov.au/inter.nsf/Attachments/LJEM-5UA84Y/$FILE/second%20part%20of%20Bruny%20Island%20Plan.pdf)

**National Parks and Wildlife Services for each state**  
**New South Wales** [www.nationalparks.nsw.gov.au](http://www.nationalparks.nsw.gov.au)  
**Australian Capital Territory** <http://www.environment.act.gov.au/>  
**Northern Territory** <http://www.nt.gov.au/nreta/parks/>  
**Queensland** <http://www.epa.qld.gov.au/>  
**South Australia** <http://www.environment.sa.gov.au/>  
**Tasmania** <http://www.dpiw.tas.gov.au/inter.nsf/Home/1?Open>  
**Victoria** <http://www.nre.vic.gov.au/>  
**Western Australia** <http://www.calm.wa.gov.au/>

**Nesting Climate and Behaviour of Cape Barren Geese (*Cereopsis novaehollandiae* Latham)**

Kerstin Wagner and Roger S. Seymour  
Department of Environmental Biology, University of Adelaide  
Australian Journal of Zoology 49(2)155-170

**Petalia.com**, a world of pet care. Avitrol Plus Worming Syrup

[http://www.petalia.com.au/templates/prodSubList.cfm?group\\_no=2103&specie=Birds](http://www.petalia.com.au/templates/prodSubList.cfm?group_no=2103&specie=Birds)

**Pet Birds.** Stress the Silent Killer

<http://pet-birds.yourinfopalace.com/stress---the-silent-killer.html>

**Pet Education.com** Dr Foster's and Smith's source to excellent pet information Holiday safety tips for your bird

<http://www.peteducation.com/article.cfm?cls=15&cat=1912&articleid=3030>

**QUARANTINE AND HEALTH SCREENING PROTOCOLS FOR WILDLIFE**

PRIOR TO TRANSLOCATION AND RELEASE INTO THE WILD

Compiled and Edited by Michael H. Woodford, Dr. vet. med., FRCVS

Published jointly by the IUCN Species Survival Commission's Veterinary Specialist Group, Gland, Switzerland, the Office International des Epizooties (OIE), Paris, France, Care for the Wild, U.K., and the European Association of Zoo and Wildlife Veterinarians, Switzerland.

**Quarantine australia state to state transfers**

Ph; 1800084881

**Readers Digest, encyclopedia of Australian wildlife**, 1997 Readers Digest

Reference. Com

<http://www.reference.com/>

**Simpson and Day, Field Guide to the birds of Australia** 6<sup>th</sup> edition Penguin books Australia 1989

**Standing comity for the European convention of the protection of animals**

June 22 1999 Recommendation concerning domestic ducks

<http://www.mapa.es/ganaderia/pags/bienestar/pdf/recpatoingles.pdf>

**The Bird Care Book**

Sheldon L. Gerstenfeld, V.M.D

Persues Books 1978

**The code of practice for the welfare of captive birds in the ATC**

[www.environment.act.gov.au](http://www.environment.act.gov.au)

**The Handling and Storage of Birds**

<http://web.uct.ac.za/depts/stats/adu/pdf/ring-manual-03.pdf>

**The Importation Of Non-Viable Eggs And Products Containing Egg** Technical Issues Paper, December 2000

[http://www.affa.gov.au/corporate\\_docs/publications/pdf/market\\_access/biosecurity/animal/2001/2001-01a.pdf](http://www.affa.gov.au/corporate_docs/publications/pdf/market_access/biosecurity/animal/2001/2001-01a.pdf)

**The IUCN Red List of Threatened Species** data base

<http://www.iucnredlist.org/search/search-basic>

**The Merck Veterinary Manual**

<http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/91600.htm>

**The National Cockatiel Society.** A Practical Guide to Disinfection in the Aviary and Home by Dave McCluggage, DVM  
<http://www.cockatiels.org/articles/vet/disinfection.html>

**The New Duck Handbook**  
Raethel, Heinz-Singurd  
Barrens Educational Series 1988

**The new incubation book**  
Dr A.F. Anderson brown and G.E.S. Robbins  
Hancock house Punblishers 2002

**The Poultry Site** Quick Disease Guide  
<http://www.thepoultrysite.com/diseaseinfo/Default.asp>

**The Shape of Enrichment volume 8 no 4 november 1999** Bird Enrichment Taking Flight by C. Sandos, aviary keeper, North Caroliner Zoological Park  
[www.torontozoo.com/meet\\_animals/enrichment/Files/Bird%20Enrichment.pdf](http://www.torontozoo.com/meet_animals/enrichment/Files/Bird%20Enrichment.pdf)

The Wonder of Birds– Cereopsis, The Cape Barren Goose  
<http://www.thewonderofbirds.com/cereopsis/>

**Tim Faulkner**, curator of Birds and Mammals  
Australian Reptile Park NSW

**Victorian government health information**, Infectious Disease  
<http://www.health.vic.gov.au/ideas/bluebook/versiniosis.htm>

Waterfowl in Australia  
H.J. Frith, Chief division Of Wildlife Research CSIRO  
REED 1967

**West Nile Virus** a reemerging global pathogen  
<http://www.highbeam.com/library/docFree.asp?DOCID=1G1:78167813>

**Wikipedia**, the free encyclopedia, Cape Barren Goose  
[http://en.wikipedia.org/wiki/Cape\\_Barren\\_Goose](http://en.wikipedia.org/wiki/Cape_Barren_Goose)

Wildlife of Tasmania, Parks and Wildlife Service, Tasmania  
<http://www.parks.tas.gov.au/wildlife/birds/cbg.html>

Wildlife Research, management and conservation;  
Conservation of the Cape Barren Goose, *Cereopsis novaehollandiae* in Tasmania  
<http://www.publish.csiro.au/paper/WR9810147.htm>

**Wing Clipping (waterfowl)** Cornerstone Farm 525 Barnes Rd Red Oak, Virginia 23964  
<http://www.cornerstonefarm.net/wingdemo.html>

Zipcode Zoo, *Cereopsis novaehollandiae*  
[http://zipcodezoo.com/Animals/C/Cereopsis\\_novaehollandiae.asp](http://zipcodezoo.com/Animals/C/Cereopsis_novaehollandiae.asp)

Zoological Society of London ZSL  
<http://www.zsl.org/discovery-learning/the-modern-zoo/animal-records,358,AR.html>



## 15 Glossary

- **ABBBS:** Australian Bird and Bat Banding Scheme.
- **Adequate:** as much or as good as necessary for some requirement or purpose.
- **Agonistic:** the range of activities associated with aggressive encounters between members of the same species, including threat, attack, appeasement, or retreat.
- **Alticial:** Born with no hair and helpless e.g. puppies kittens mice, the Cape Barren Goose is not.
- **Apnea:** a temporary suspension of breathing.
- **ARA:** Animal Research Act.
- **ARAZPA:** Australasian Regional Association of Zoological Parks and Aquaria.
- **ASMP:** Australasian Species Management Program (generates captive species recommendations for ARAZPA).
- **ASZK:** Australian Society Of Zoo-keepers.
- **CBSG:** Captive Breeding Specialist Group.
- **CBG:** Cape Barren Goose.
- **Cere:** The area around the nostrils at the base of the bill.
- **CITES:** Convention on International Trade in Endangered Species.
- **Choana:** throat.
- **Cloaca:** vent.
- **Conspecific:** of the same species (same origin).
- **Copulation:** the act of mating.
- **EAPA:** Exhibited Animals Protection Act.
- **Endemic:** Prevalent in a particular locality, region, or people: diseases endemic to the tropics.
- **Endothermic:** Capable of regulating ones own body temperature.
- **EPA:** Environmental Protection Agency.
- **EPBC act:** Environmental Protection and biodiversity act, (regulation of import and export).
- **Facilitate:** to help or make something easier.
- **Fledging:** the completion of feather growth to allow a young bird to fly.
- **Formite:** Anything that can carry a microbe (pathogen) to a susceptible individual.
- **Furnishings:** items put inside an enclosure that are not part of the enclosure, used for enrichment and general purposes.
- **Gregarious:** Seeking and enjoying the company of others; sociable. Tending to move in or form a group with others of the same kind.
- **Hybrid:** Two species breeding– they can not produce fertile young.
- **Hierarchy:** the ranking system within a group, some are higher than others– a pecking order.
- **I.A.T.A:** International Air Transport Association.
- **Innocuous:** harmless, not likely to irritate, non venomous.
- **Inhalation:** to breath something in.
- **Ingestion:** to swallow and digest something.
- **Integrate:** Two sub-species mating, they can produce fertile young.
- **Interspecific:** existing or occurring between species.
- **Intraspecific:** existing or occurring within a species.

- **ISIS:** International Species Information System.
- **Keel:** the breast bone of a bird.
- **Lateral recumbency:** lying characterised by full lateral contact of the body, trunk, head, and legs on one side with the ground.
- **Lesion:** cut, injury, wound.
- **Longevity:** the life expectancy of an animal.
- **Metabolic rate:** rate of metabolism, amount of energy expended in a given period (also oxygen used, and food consumed).
- **Monogamous / Monogamy:** Spend Life with same mate (one partner).
- **Monomorphic:** Can't tell the difference between males and females.
- **Monotonous:** repetitive, same thing all the time.
- **Monotypic:** An animal with no subspecies.
- **Nomenclature:** A system of names used in a science, as of anatomical structures or biological organisms.
- **Olfactory:** of or relating to the sense of smell.
- **POCTA Act:** Prevention Of Cruelty To Animals.
- **Polytypic:** Animal that has sub-species.
- **PPE:** Personal protective Equipment.
- **Precolial:** Born with hair, and capable of running immediately –the Cape Barren Goose is.
- **REGASP:** Regional Animals species collection plan.
- **Residual capacity:** the remaining capacity /amount.
- **Sexual dimorphism:** the physical differences between a male and female of the same species.
- **Spatial:** existing and occurring in space, having an extension of space.
- **SSC:** Species Survival Commission.
- **Substrate:** the material used to cover the ground in an enclosure.
- **Synonyms:** A scientific name of an organism or of a taxonomic group that has been superseded by another name at the same rank.
- **Taxa:** A plural of taxon. A taxonomic category or group, such as a phylum, order, family, genus, or species.
- **Territorial:** defending an area against intruders.
- **Ubiquitous:** Every where.
- **Undernourished:** not nourished with sufficient or proper food to promote normal or healthy growth.
- **Vigilant:** keeping watchful to detect danger.
- **Zoonotic/ zoonosis:** a disease or ailment that can be transferred from animals to humans.

-[Dictionary. COM](#)

-[Reference. COM](#)

## (Appendix 1)

## Annual Cycle Of Maintenance

|                                        | <u>Jan</u> | <u>Feb</u> | <u>mar</u> | <u>apr</u> | <u>may</u> | <u>jun</u> | <u>jul</u> | <u>aug</u> | <u>sep</u> | <u>oct</u> | <u>nov</u> | <u>dec</u> |
|----------------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Breeding season                        |            |            |            |            |            |            |            |            |            |            |            |            |
| Young hatch                            |            |            |            |            |            |            |            |            |            |            |            |            |
| Minimize disturbance                   |            |            |            |            |            |            |            |            |            |            |            |            |
| Feed Breeder food                      |            |            |            |            |            |            |            |            |            |            |            |            |
| Add nest building material             |            |            |            |            |            |            |            |            |            |            |            |            |
| Operate incubators                     |            |            |            |            |            |            |            |            |            |            |            |            |
| Sex/ leg band goslings                 |            |            |            |            |            |            |            |            |            |            |            |            |
| Routine Health Checks                  |            |            |            |            |            |            |            |            |            |            |            |            |
| Annual vet check                       |            |            |            |            |            |            |            |            |            |            |            |            |
| Enclosure renovations                  |            |            |            |            |            |            |            |            |            |            |            |            |
| Enclosure full clean/ substrate change |            |            |            |            |            |            |            |            |            |            |            |            |
| Moulting season                        |            |            |            |            |            |            |            |            |            |            |            |            |
| Clip wings                             |            |            |            |            |            |            |            |            |            |            |            |            |
| Worming/fecal                          |            |            |            |            |            |            |            |            |            |            |            |            |
| Mite/ lice control                     |            |            |            |            |            |            |            |            |            |            |            |            |
| Coccidiosis control                    |            |            |            |            |            |            |            |            |            |            |            |            |

- Breeding season is between may and august every year (see 10.6)
- Depends on time of copulation (see 10.12)
- Minimize disturbance before, during the breeding season and also while the goslings are being parent raised (independence is 16 weeks) (see 10.16)
- Feed one cup extra of cracked corn (see 6.2 suggested diet)
- Add nest material periodically before and during incubation just in case they add some fresh material to the nest (see 10.10)
- Have incubators ready and on prepared for the need to incubate eggs (11.2)
- Sex goslings when they are banded at 4-6 weeks (see 10.16 )
- Do routine health checks monthly (see 8.2)
- Do annual vet checks just after the moult so wings can be clipped at the same time for less disturbance if they have goslings (see 11.10)
- Any renovations to be done after the goslings are removed from the parents but before they breed again (also plant tussock grass and re-turf at this time)
- Three monthly complete clean outs should be avoided if you are breeding the geese ( otherwise also clean in July)
- Usually October but depends on when they bred. (see 10.11)
- Just before the primaries have fully grown back from the moult (see 11.10)
- Worm and take fecal samples 3 monthly but not during breeding if u are breeding them (see 8.3 )
- Treat birds and cage annually ( in summer) just in case there is an unnoticed infestation (see 8.3)
- Treat goslings when they are 2-3 weeks old (see 8.3)

## Appendix (2) Air waybill example



### Live Animals Regulations

#### AIR WAYBILL EXAMPLE

|                                                                                                                                                            |                  |                         |                    |                     |        |                                                                                                                                                                                                   |                                                           |        |                   |                             |                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------------|--------------------|---------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------|-------------------|-----------------------------|----------------------------|
| To                                                                                                                                                         | By First Carrier | Routing and Destination | to                 | by                  | to     | by                                                                                                                                                                                                | Currency                                                  | WT/VAL | Other             | Declared Value for Carriage | Declared Value for Customs |
|                                                                                                                                                            |                  |                         |                    |                     |        |                                                                                                                                                                                                   |                                                           | Code   | PPD COLL PPD COLL |                             | 350.                       |
| Airport of Destination                                                                                                                                     |                  | Requested Flight/Date   |                    | Amount of Insurance |        | INSURANCE - If carrier offers insurance, and such insurance is requested in accordance with the conditions thereof, indicate amount to be insured in figures in box marked "Amount of Insurance". |                                                           |        |                   |                             |                            |
| Vienna                                                                                                                                                     |                  |                         |                    |                     |        |                                                                                                                                                                                                   |                                                           |        |                   |                             |                            |
| Handling Information<br>24 HOUR CONTACT PHONE No: 1234567<br>CERTIFICATES OF HEALTH AND ORIGIN ATTACHED<br>SHIPPER'S CERTIFICATION FOR LAR ATTACHED<br>SCI |                  |                         |                    |                     |        |                                                                                                                                                                                                   |                                                           |        |                   |                             |                            |
| No. of Pieces RCP                                                                                                                                          | Gross Weight     | kg                      | Rate Class         | Chargeable Weight   | Rate   | Total                                                                                                                                                                                             | Nature and Quantity of Goods (incl. Dimensions or Volume) |        |                   |                             |                            |
|                                                                                                                                                            |                  | lb                      | Commodity Item No. |                     | Charge |                                                                                                                                                                                                   |                                                           |        |                   |                             |                            |
|                                                                                                                                                            |                  |                         |                    |                     |        |                                                                                                                                                                                                   | 2 LIVE CANARIES<br>DIMS 30x30x40 CM                       |        |                   |                             |                            |



### NOTIFICATION TO CAPTAIN (NOTOC) EXAMPLE

| SPECIAL LOAD — NOTIFICATION TO CAPTAIN                                                                                         |                    |                          |                                            |                       |                           |                    |                                          |                          |               |                    |         |        |          |
|--------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------------|--------------------------------------------|-----------------------|---------------------------|--------------------|------------------------------------------|--------------------------|---------------|--------------------|---------|--------|----------|
| Station of Loading                                                                                                             |                    | Flight Number            | Date                                       | Aircraft Registration |                           | Prepared by        |                                          |                          |               |                    |         |        |          |
| <b>DANGEROUS GOODS</b>                                                                                                         |                    |                          |                                            |                       |                           |                    |                                          |                          |               |                    |         |        |          |
| Station of Unloading                                                                                                           | Air Waybill Number | Proper Shipping Name     | Class or Division For Class 1 compat. grp. | UN or ID Number       | Sub Risk                  | Number of Packages | Net quantity or Transp. Ind. per package | Radio-active Mat. Categ. | Packing Group | Code (see reverse) | CAO (X) | Loaded |          |
|                                                                                                                                |                    |                          |                                            |                       |                           |                    |                                          |                          |               |                    |         | ULD ID | POSITION |
|                                                                                                                                |                    |                          |                                            |                       |                           |                    |                                          |                          |               |                    |         |        |          |
| <p>*There is no evidence that any damaged or leaking packages containing dangerous goods have been loaded on the aircraft.</p> |                    |                          |                                            |                       |                           |                    |                                          |                          |               |                    |         |        |          |
| <b>OTHER SPECIAL LOAD</b>                                                                                                      |                    |                          |                                            |                       |                           |                    |                                          |                          |               |                    |         |        |          |
| Stat. of Unload                                                                                                                | Air Waybill Number | Contents and Description | Number of Packages                         | Quantity              | Supplementary Information | Code (see reverse) | Loaded                                   |                          |               |                    |         |        |          |
|                                                                                                                                |                    |                          |                                            |                       |                           |                    | ULD ID                                   | POSITION                 |               |                    |         |        |          |
|                                                                                                                                |                    |                          |                                            |                       |                           |                    |                                          |                          |               |                    |         |        |          |
| Loading Supervisor's Signature                                                                                                 |                    | Captain's Signature      |                                            | Other information     |                           |                    |                                          |                          |               |                    |         |        |          |

\*This sentence must be shown on the NOTOC. The location is left to the discretion of the carrier.

## Appendix (4) import export doc Front of page



### Live Animals Regulations

#### CITES EXPORT/RE-EXPORT PERMIT EXAMPLE (Front)

| <b>CONVENTION ON<br/>INTERNATIONAL TRADE IN<br/>ENDANGERED SPECIES OF<br/>WILD FAUNA AND FLORA</b>                                                                                                                                                                               |          | <b>PERMIT / CERTIFICATE No.</b><br><br><input type="checkbox"/> EXPORT<br><input type="checkbox"/> RE-EXPORT<br><input type="checkbox"/> IMPORT<br><input type="checkbox"/> OTHER: |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 3. Importer (name and address)                                                                                                                                                                                                                                                   |          | 4. Exporter (name and address, country)                                                                                                                                            |           |
| 3a. Country of Import                                                                                                                                                                                                                                                            |          | 5. Name, address, national seal/stamp and country of Management Authority                                                                                                          |           |
| 5. Special conditions                                                                                                                                                                                                                                                            |          | 2. Valid until                                                                                                                                                                     |           |
| For live animals, this permit or certificate is only valid if the transport conditions conform to the Guidelines for Transport of Live Animals or, in the case of air transport, to the IATA Live Animals Regulations.                                                           |          | Signature of the applicant                                                                                                                                                         |           |
| 5a. Purpose of the transaction (see reverse)      5b. Security stamp N                                                                                                                                                                                                           |          | 10. Appendix No. and source (see reverse)                                                                                                                                          |           |
| 7.8. SCIENTIFIC NAME (genus and species) AND COMMON NAME OF ANIMAL OR PLANT                                                                                                                                                                                                      |          | 11. Quantity (including unit)                                                                                                                                                      |           |
| 9. Description of specimens, including identifying marks or numbers (see/last if live)                                                                                                                                                                                           |          | 11a. Total exported/Quota                                                                                                                                                          |           |
| 7.9.                                                                                                                                                                                                                                                                             |          | 10.                                                                                                                                                                                |           |
| 12. Country of origin *      Permit No.      Date                                                                                                                                                                                                                                |          | 12a. Country of last re-export      Certificate No.      Date                                                                                                                      |           |
| 12b. No. of the operation ** or date of acquisition ***                                                                                                                                                                                                                          |          | 11b.                                                                                                                                                                               |           |
| 7.9.                                                                                                                                                                                                                                                                             |          | 10.                                                                                                                                                                                |           |
| 12. Country of origin *      Permit No.      Date                                                                                                                                                                                                                                |          | 12a. Country of last re-export      Certificate No.      Date                                                                                                                      |           |
| 12b. No. of the operation ** or date of acquisition ***                                                                                                                                                                                                                          |          | 11b.                                                                                                                                                                               |           |
| 7.9.                                                                                                                                                                                                                                                                             |          | 10.                                                                                                                                                                                |           |
| 12. Country of origin *      Permit No.      Date                                                                                                                                                                                                                                |          | 12a. Country of last re-export      Certificate No.      Date                                                                                                                      |           |
| 12b. No. of the operation ** or date of acquisition ***                                                                                                                                                                                                                          |          | 11b.                                                                                                                                                                               |           |
| 7.9.                                                                                                                                                                                                                                                                             |          | 10.                                                                                                                                                                                |           |
| 12. Country of origin *      Permit No.      Date                                                                                                                                                                                                                                |          | 12a. Country of last re-export      Certificate No.      Date                                                                                                                      |           |
| 12b. No. of the operation ** or date of acquisition ***                                                                                                                                                                                                                          |          | 11b.                                                                                                                                                                               |           |
| * Country in which the specimens were taken from the wild, bred in captivity or artificially propagated (only in case of re-export)<br>** Only for specimens of Appendix-1 species bred in captivity or artificially for commercial purposes<br>*** For pre-Convention specimens |          |                                                                                                                                                                                    |           |
| 13. THIS PERMIT IS ISSUED BY:                                                                                                                                                                                                                                                    |          |                                                                                                                                                                                    |           |
| Place                                                                                                                                                                                                                                                                            |          | Date                                                                                                                                                                               |           |
| Security stamp, signature and official seal                                                                                                                                                                                                                                      |          |                                                                                                                                                                                    |           |
| 14. EXPORT ENDORSEMENT:                                                                                                                                                                                                                                                          |          | 15. Bill of Lading/Air Waybill Number:                                                                                                                                             |           |
| Block                                                                                                                                                                                                                                                                            | Quantity |                                                                                                                                                                                    |           |
| A                                                                                                                                                                                                                                                                                |          |                                                                                                                                                                                    |           |
| B                                                                                                                                                                                                                                                                                |          |                                                                                                                                                                                    |           |
| C                                                                                                                                                                                                                                                                                |          |                                                                                                                                                                                    |           |
| D                                                                                                                                                                                                                                                                                |          |                                                                                                                                                                                    |           |
| Port of Export                                                                                                                                                                                                                                                                   |          | Date                                                                                                                                                                               | Signature |
|                                                                                                                                                                                                                                                                                  |          | Official stamp and title                                                                                                                                                           |           |
| CITES PERMIT / CERTIFICATE N°                                                                                                                                                                                                                                                    |          |                                                                                                                                                                                    |           |

**Note:** This document has been reduced for inclusion in these Regulations.





## CITES EXPORT/RE-EXPORT PERMIT EXAMPLE (Back)

**Instructions and Explanations***(These correspond to block numbers on the form)*

1. Tick the square which corresponds to the type of document issued (export permit, re-export certificate, import permit or other). If the square "other" has been ticked, the type of document must be indicated. The original number is a unique number allocated to each permit by the Management Authority.
2. For export permits and re-export certificates, the date of expiry of the document may not be more than six months after the date of issuance (one year for import permits).
3. Complete name and address of the consignee.
- 3a. The name of the country must be written in full.
4. Complete name and address of person(s) who or company who/ which has been granted a permit. The name of the country must be stated.
5. Special conditions may refer to national legislation or special conditions placed on the shipment by the exporting or re-exporting country. This square can also be used to justify the omission of certain information.
- 5a. The following codes should be used:
  - T Commercial
  - Z Zoos
  - G Botanical gardens
  - Q Circuses and travelling exhibitions
  - S Scientific
  - H Hunting trophies
  - P Personal
  - M Bio-medical research
  - E Educational
  - N Reintroduction or introduction into the wild
  - B Breeding in captivity or artificial propagation
- 5b. Indicate the security stamp number (including the country's ISO code).
6. The name and address of the Management Authority of the country issuing the document should be already printed on the form.
- 7-8. Indicate the common name of the animal or plant as known in the country issuing the permit, and the scientific name (genus and species, where appropriate sub-species) of the animal or plant as it appears in the Convention appendices or the reference lists approved by the Conference of the Parties.
9. Describe, as precisely as possible, the specimens entering trade (live animals, skins, flanks, wallets, shoes, etc.). If a specimen is marked (tags, identifying marks, rings, etc.), whether or not this is required by a Resolution of the Conference of the Parties (specimens originating in a ranching operation, specimens subject to quotas approved by the Conference of the Parties, specimens of Appendix-I species bred in captivity for commercial purposes, etc.). Indicate the number and type of mark. The sex and age of the live specimens should be recorded, if possible.
10. Enter the number of the appendix of the Convention (I, II or III) in which the species is listed. Use the following codes to indicate the source:
  - W Specimens taken from the wild
  - R Specimens originating from a ranching operation
  - D Appendix-I animals bred in captivity for commercial purposes and Appendix-I plants artificially propagated for commercial purposes, as well as parts and products thereof, exported under the provisions of Article VII, paragraph 4, of the Convention.
  - A Plants that are artificially propagated in accordance with Resolution Conf. 9.18 paragraph a), as well as parts and products thereof, exported under the provisions of Article VII, paragraph 5, of the Convention (specimens of species included in Appendix I that have been propagated artificially for non-commercial purposes and specimens of species included in Appendices II and III).
  - C Animals bred in captivity in accordance with Resolution Conf. 2.12, as well as parts and products thereof, exported under the provisions of Article VII, paragraph 5, of the Convention (specimens of species included in Appendix I that have been bred in captivity for non-commercial purposes and specimens of species included in Appendices II and III).
  - F Animals born in captivity (F1 or greater) that do not fulfil the definitions of "bred in captivity" in Resolution Conf. 2.12 (Rev.), as well as parts and products thereof.
  - U Source unknown (**must be justified**).
  - I Confiscated or seized specimens.
11. Indicate the total number of specimens or, if this is not possible, the quantity, and specify the unit of measurement used (for example the weight in kilograms). Do not use general terms such as "a case" or "a batch".
- 11a. Indicate the total number of specimens exported in the current calendar year (including those covered by the present permit) and the current annual quota for the species concerned (for example 500/1000). This should be done for the national quotas as well as for those determined by the Conference of the Parties.
12. The country of origin is the country in which the specimens were taken from the wild, bred in captivity or artificially propagated. Indicate the number of the export permit of the country and the date of issuance. If all or part of the information is not known, this should be justified in block 5. This block must only be completed in case of re-export.
- 12a. The country of last re-export is the country from which the specimens were re-exported before entering the country in which the present document was issued. Enter the number of the re-export certificate of the country of last re-export and its date of issuance. If all or part of the information is now known, this should be justified in block 5. This block must only be completed in case of re-export of specimens previously re-exported.
13. To be completed by the official who issues the permit. The name of the official (and his title) must be written in full. The security stamp must be affixed in this block and must be cancelled by the seal and signature of the issuing official. The seal, signature and security stamp should be clearly legible.
14. To be completed by the official who inspects the shipment at the time of export or re-export. Enter the quantities of specimens actually exported or re-exported. Strike out the unused blocks.
15. Enter the number of the bill of lading or air waybill, if the method of transport used requires the use of such a document.

**The document must be written in one of the three working languages of the Convention (English, French and Spanish) or must include a full translation into one of these three languages. Exported and re-exported specimens should not appear on the same documents.**

**After use, this document must be returned to a Management Authority of the importing country.**

**Note:** This document has been reduced for inclusion in these Regulations.



## Appendix (5) Shippers certificate



## Documentation



### SHIPPER'S CERTIFICATION FOR LIVE ANIMALS

(to be completed in duplicate)

This is to certify that (check appropriate box):

- ☒ In addition to having completed all advance arrangements, this consignment is properly described and packed, and is in proper condition for carriage by air according to the current edition of the IATA Live Animals Regulations and all applicable carrier and governmental regulations. The animal(s) of this consignment is (are) in good health and condition.
- ☐ Animals taken from the wild for shipment have been appropriately acclimatised.
- ☒ This consignment does not include Appendix I species as described in the Convention on International Trade in Endangered Species of Wild Fauna and Flora or in other applicable national legislations. Applicable permits/certificates are attached to the air waybill.
- ☐ The endangered species contained in this consignment can be legally carried and imported into the country of ultimate destination and through the transit countries en route.

The shipper accepts that carriers will not be liable for any loss, damage or expense arising from death due to natural causes, or death or injury of any animal caused by the conduct or acts of the live animal itself or of other animals, such as biting, kicking, goring or smothering, nor for that caused or contributed to by the conditions, nature or propensities of the animals. In no event will carrier be liable for death or injury to an animal attendant caused or contributed to by the condition, conduct or acts of animals.

| Number of Package(s) | Specific Container Requirement Number (see IATA Live Animals Regulations) | Species (description and names — scientific and common) and Quantity of Animals |
|----------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| 2                    | 3                                                                         | 10 Adult cattle                                                                 |
| 1                    | 3                                                                         | 26 Weaner pigs                                                                  |
|                      |                                                                           |                                                                                 |
|                      |                                                                           |                                                                                 |
|                      |                                                                           |                                                                                 |

|                                                                                                                                                                                                                       |                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name and address of shipper <u>ABC Transport</u><br><u>Lancaster, U.K.</u><br>Signature of shipper <u>J. Smith</u><br>Date <u>98/10/01</u><br><small>Year/Month/Day (See reverse side for special conditions)</small> | Shippers failure to comply in all respects with the applicable IATA Live Animals Regulations and any other international and/or national government regulations, may be in breach of applicable law and subject to legal penalties. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                           |                                        |                                    |
|---------------------------|----------------------------------------|------------------------------------|
| Air Waybill No.<br>123456 | Airport of Departure<br>London Gatwick | Airport of Destination<br>Budapest |
|---------------------------|----------------------------------------|------------------------------------|

#### Explanation for the above example:

Domestic animals need to have the stocking density calculated for the species. These cattle therefore need two bulk crates because they are adults. The pigs can be subdivided on a double-decker bulk crate. They must be crated in compatible groups which the shipper will select. This shipment could have 4 groups each comprising 6 to 7 animals, provided the stocking density is correct for their age and size of the compartments.

Since they are not taken from the wild and not an endangered consignment, therefore the second and the fourth box are left blank.

## Appendix (6) Known Health Problems

The Cape Barren is susceptible to many avian diseases, some endemic diseases relevant are listed below.

| Bacterial Diseases                           | pathogen                                                       | Epidemiology                                                                                        | Affects                                                                                        | Treatments                                                                                                                                                                                |
|----------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Anthrax (Zoonotic)</b>                    | <i>Bacillus anthracis</i><br>Forms spores                      | Inhalation and ingestion or spores from contaminated Geese                                          | Black skin lesions, hemorrhaging, sudden death.                                                | Antibiotics such as amoxicillin, doxycycline and enrofloxacin                                                                                                                             |
| <b>Avian Tuberculosis (Zoonotic)</b>         | <i>Mycobacterium avium</i> or <i>genavense</i>                 | When the mycobacterium over contaminates the soil, wild birds may act as carriers                   | Wasting lameness, Diarrhea, Depression, death                                                  | Experimental drug regimes, good husbandry (disinfecting etc) Cull.                                                                                                                        |
| <b>Botulism (Zoonotic)</b>                   | <i>Clostridium Botulinum</i><br>Produces a toxin               | Ingestion of food or water contaminated by the toxin produced.                                      | Drowsiness weakness, difficulty walking, paralysis of wings neck and legs                      | Provide shade, fresh water and a secure environment, in severe cases use the specific antitoxin                                                                                           |
| <b>Erysipelas</b>                            | <i>Erysipelothrix rhusiopathiae</i>                            | Transmitted through fecal carriers, soil, water, and semen                                          | No appetite, depression, sleepiness, diarrhea, scabby skin and sudden death                    | Penicillin, bacterin, tetracyclines                                                                                                                                                       |
| <b>#Mycoplasma Infection</b>                 | <i>Acholeplasma axanthum</i> and <i>Acholeplasma laidlawii</i> | For young geese the common source of Mycoplasma infection is from the hatching egg.                 | Reduced growth and fertility, respiratory and air sack infections                              | Treatment of eggs from an infected flock is achieved by dipping the eggs in a tylosin. Infected goslings can be treated by adding either tetracycline or tylosin to their drinking water. |
| <b>#Nerotic Enteritis</b>                    | <i>Clostridium perfringens</i>                                 | Faecal– oral transmission, predisposing factors; coccidiosis poor diet (high protein, rye or wheat) | Depression, ruffled feathers, immobility, closed eyes, no appetite, dark diarrhea sudden death | Penicillin's in drinking water, treatment in ducks is not very effective                                                                                                                  |
| <b>psittacosis (chlamydiosis) (Zoonotic)</b> | <i>Chlamydia psittaci</i>                                      | Infected droppings, dust, fluff, bird carcasses                                                     | Trembling, unbalanced gait, greenish diarrhea, dehydration, eye and nasal discharge            | Broad spectrum antibiotics, particularly tetracyclines                                                                                                                                    |
| <b>Avian pseudotuberculosis (zoonotic)</b>   | <i>Yersinia pseudotuberculosis</i>                             | Skin penetration, ingestion                                                                         | Acute septicemia, diarrhea, emaciation, drowsiness, anorexia, ruffled feathers                 | Chlortetracycline via drinking water or feed for 3 weeks                                                                                                                                  |

| Bacterial Diseases continued          | Pathogen                                                                                                                              | Epidemiology                                                                                                    | Effects                                                                                     | treatment                                                                                                                          |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Salpingitis</b>                    | <i>Bordetella avium</i> ,<br><i>Aeromonas hydrophila</i> ,<br><i>Actinobacillus</i> ,<br><i>Citrobacter freundii</i><br>And many more | Inflammation of the oviduct, is infected through the air sac or up through the vent                             | Damaged vents, leaking urates, distended abdomen, death                                     | Will not respond to treatment in later stages use of a suitable antimicrobial in early stages                                      |
| <b>Avian Salmonellosis (zoonotic)</b> | <i>Salmonella</i> spp                                                                                                                 | It is always in the environment, when birds are to concentrated or stressed it infects them and spreads rapidly | lesions may occur in skeletal muscle, heart, other tissues.                                 | No known treatment, is likely to be fatal. Prevent by having raised feeders. Disinfect regularly and remove seed husks from ground |
| <b>Spirochaetosis</b>                 | <i>Borrellia anserina</i>                                                                                                             | Carried by ticks mosquitoes, lice and mites, then contagious between birds                                      | ^temperature depression, ruffled feathers, cyanotic heads, green diarrhea, paralyzed, death | Penicillin by Injection or drinking water                                                                                          |
| <b>Streptococcosis</b>                | <i>Streptococcus zooepidemicus</i> and <i>Streptococcus Faecalis</i> , <i>streptococcosis mutans</i>                                  | Not clearly established, recovered birds can become intestinal carriers                                         | Depression, lassitude, yellowish diarrhea and death                                         | Bread spectrum antibiotics in drinking water or S/C injection with streptomycin                                                    |

-The Importation Of Non-Viable Eggs And Products

-Avian Chlamydiosis (Psittacosis)

-Avian Tuberculosis

-A manual of Poultry Diseases

-FAO goose production France

-Birds 2000

-The Poultry Site Disease Guide

-List of agents associated with waterfowl disease

-Au Gov pests and diseases

-Victorian government health information

-Animal Health Australia

-Avian Salmonellosis

| <b>Viral Diseases</b>                                                                            | <b>Pathogen</b>                                                           | <b>Epidemiology</b>                                                                                         | <b>Affects</b>                                                                                                                                                                    | <b>Treatment</b>                                                                                    |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <b>Avian Influenza (Zoonotic) has the potential to become endemic</b>                            | A1 virus from the type A influenza group                                  | Spread by direct contact, manure, clothes and equipment                                                     | Swelling of the head, nasal discharge, coughing, sneezing, Diarrhea, death                                                                                                        | Fatal, inform authorities to prevent the spread of this disease in Australia.                       |
| <b>Avian encephalomyelitis</b>                                                                   | Picornaviridae                                                            | Viral disease of the central nervous system, transmitted, transovarian, orally, & in faeces                 | Nervous signs, dull expression, ataxia and sitting on hocks, imbalance, paralysis, and tremors                                                                                    | Treatment; none but vaccinate at 9-15 weeks                                                         |
| <b>Duck Hepatitis B</b>                                                                          | Family Hepadnaviridae<br>genus Orthohepadnavirus                          | DNA virus                                                                                                   | Needs further research                                                                                                                                                            | Needs further research                                                                              |
| <b>Avian Pox, Fowl Pox</b>                                                                       | A number of strains belonging to the avian pox virus<br>Family Poxviridae | Mosquitoes and other insects and mechanical spread through injury to tissues                                | Cutaneous form; Inflammation and scab like lesions on the surface of the skin<br>Diphtheritic form; Lesions appear on the mucus membrane and may spread to the respiratory system | Broad spectrum antibiotics                                                                          |
| <b>Newcastle Disease (Zoonotic) (exotic though there have been 6 outbreaks in AU since 1998)</b> | A virus from the paramyxovirus group                                      | Excreted from the respiratory tract and in the faeces air born, humans, contaminated vaccines and equipment | Depression, no appetite, diarrhea, swelling of the head, increased respiration, nasal or eye discharge, coughing                                                                  | Broad spectrum antibiotics yet nothing is truly effective                                           |
| <b>Reticuloendotheliosis virus infection</b>                                                     | A leukovirus or retrovirus                                                | Shed in faeces, insect vectors, contaminated vaccines                                                       | Immunosuppression<br>runt syndrome and lymphoproliferative lesions                                                                                                                | None has a response, always use R.E.V free vaccines. Cull affected Geese                            |
| <b>Murray Valley encephalitis (zoonotic)</b>                                                     | genus Flavivirus                                                          | Mosquitoes feed on birds effected by the virus then spread it to other birds, animals and humans            | Weight loss, decreased activity, depression, dehydration, hemorrhaging, pale lungs, possible death                                                                                | Notification of authorities, not effective treatment or vaccine, IV fluids, respiratory assistance. |

-The Importation Of Non-Viable Eggs And Products

-A manual of Poultry Diseases

-Highly Pathogenic Avian Influenza

-Birds 2000

-FAO goose production France

-West Nile Virus

-Agents associated with disease in waterfowl



## Previous table references

- Fatal Encephalitis and Myocarditis in Young Domestic Geese
- Goose Diseases
- Au Gov pests and diseases
- Victorian government health information
- Animal Health Australia

| Protozoan, Fungal and yeast infections                 | Pathogen                                                                                                               | Epidemiology                                                                                                                                                                                | Affects                                                                                        | Treatment                                                                                                                                                        |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Aspergillosis (Zoonotic)</b>                        | <i>Aspergillus flavus</i><br>A fungus                                                                                  | Inhalation, through conjunctiva, contaminated areas and equipment                                                                                                                           | Decreased feed intake, gasping and labored breathing in chicks diarrhea                        | Not recommended, remove source, good husbandry, spray with 1% copper sulfate to remove fungi                                                                     |
| <b>Coccidiosis (zoonotic) (protozoan)</b>              | Numerous species protozoan intracellular parasites                                                                     | Ingestion of a sporulated oocyst                                                                                                                                                            | Lethargy, weight loss, dehydration, diarrhea, death                                            | Anti-coccidial drugs like coccivet toltro & trimsul                                                                                                              |
| <b>Cryptosporidiosis</b>                               | This is a protozoan disease caused by parasites of the genus <i>Cryptosporidium</i>                                    | Infects both the lungs and intestine of Geese.                                                                                                                                              | depression, sneezing and respiratory distress with moderate mortality, and diarrhea            | No effective treatment, steam clean affected enclosure                                                                                                           |
| <b>Giardia</b>                                         | protozoan                                                                                                              | Droppings, contaminated food or water, it matures in intestinal tract                                                                                                                       | Diarrhea, dry skin, feather plucking                                                           | Metronidazole and vitamins                                                                                                                                       |
| <b>Mycotoxicosis</b>                                   | <i>Aspergillus</i> spp.<br><i>Aspergillus flavus</i><br><i>Aspergillus parasiticus</i><br><i>Penicillium puberulum</i> | Exposure to mycotoxins through contaminated feedstuff                                                                                                                                       | Decreased feed, increased water intake, reduced activity, reduced fertility, death             | Replace feed with fresh uncontaminated feed                                                                                                                      |
| <b>Sarcocystosis (rice-breast disease) (protozoan)</b> | <i>Sarcocystis rileyi</i>                                                                                              | Birds contract eggs orally through faeces, it then migrates in to the muscles where it remains till bird is eaten by a predator, it reaches maturity in predators intestine then reproduces | Weakness and lameness in muscles                                                               | Therapeutic treatment has been ineffective, no vaccine is available. When feeding carrion always ensure it as been frozen below -4° for 6 weeks to kill protozoa |
| <b>Toxoplasmosis (Zoonotic) (protozoan)</b>            | <i>Toxoplasma gondii</i>                                                                                               | Felids are the definitive host, shedding the protozoa in their faeces, it is consumed by warm blooded animals                                                                               | No signs in adult, still births and signs in juveniles include fever, diarrhea coughing, death | For animals other than humans treatment is seldom warranted, sulfadiazine and pyrimethamine, but will not eradicate infection                                    |



| Protozoan, Fungal and yeast infections | Pathogen                                                      | Epidemiology                                             | Effects                                        | Treatment                                                                            |
|----------------------------------------|---------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Trichomoniasis</b>                  | <i>Trichomonis gallinae</i><br><i>Tetratrichomonis anatis</i> | Transmitted from bird to bird through the water and feed | Reduced productive performance and weight loss | Nitrofurazon, metronidazole and dimetridazole are effective in treating the disease. |

#### References from above table;

- A manual of Poultry Diseases
- Birds 2000
- The Bird Care Book
- FAO goose production France
- Goose Diseases
- Au Gov pests and diseases
- Victorian government health information
- Animal Health Australia
- Agents associated with disease in waterfowl
- The Merck Veterinary Manual
- Microbe Wiki; Sarcocistosis

| Internal parasites              | Pathogen                                                                                | Epidemiology                                                                                                                                                | Effects                                                                                               | Treatment                                                                                                                                   |
|---------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Caecal worms (nematodes)</b> | <i>Heterakis gallinae</i>                                                               | Eggs are injected then hatch in the duodenum, move to the caecae for 5 days then the lumen to reach maturity                                                | Typhilitis, unthriftiness, diarrhea and emaciation.                                                   | Phenothiazine, piperazine salts, hygromycin B or Levamisole                                                                                 |
| <b>Flukes (trematodes)</b>      | Over 500 species belonging to 125 genera and 27 families are known to occur in birds.   | Most flukes have an aquatic snail (genus Limnaea) as an intermediate host. The dragonfly (genus Odonata) is the second intermediate host in many cases.     | Flukes may invade almost every cavity and all tissue of birds                                         | The only practical solution is to remove the birds from the source of infection. This can be done if the intermediate host(s) is/are known. |
| <b>Gapeworms</b>                | <i>Syngamus trachea</i><br><i>Cyathostoma brantae</i><br><i>cyathostoma bronchialis</i> | Upon ingestion they move via the bloodstream to trachea. Eggs coughed up from trachea then swallowed and passed in droppings                                | Respiratory distress possible death from asphyxiation                                                 | None effective, isolate birds, improved hygiene                                                                                             |
| <b>Gizzard worms</b>            | <i>Acuaria</i> Species                                                                  | Intermediate hosts; grasshoppers, weevils, beetles                                                                                                          | Wasting, weakness, anemia                                                                             | None effective, sanitation, elimination of intermediate hosts                                                                               |
| <b>Heartworm</b>                | <i>Sarconema euryerca</i><br>Intermediate host; biting louse, <i>trinaton anserinum</i> | In geese it is spread by infected lice bites, grow in heart and lungs produce offspring called microfilariae which are sucked by lice from the blood stream | Field signs are not always present in affected birds, it can not be diagnosed by clinical signs alone | Control of not practical in free range Geese, decrease the opportunity of the intermediate host                                             |

| Internal parasites continued                          | Parasite                                               | Epidemiology                                                                                                                                  | Effects                                                                                                              | Treatment                                                                                                                 |
|-------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Large Roundworm (nematodes)</b>                    | <i>Ascaridia galli</i>                                 | Live in the lumen in the small intestine, eggs are passed and with the correct conditions they develop on the ground then are eaten and hatch | Growth depression, drowsiness, ruffled feathers, emaciated, diarrhea, and anemia                                     | Piperazine salts to eliminate mature stages, repeat as they become mature, also Levamisole for mature and immature stages |
| <b>Tapeworms (cestodes)</b>                           | Class cestoda (many species)                           | Attaches to intestinal wall, eggs are passed with droppings, intermediate host; slugs, snails, fly's, ants etc                                | Loss of appetite, ruffled feathers, emaciation, diarrhea, and anemia in young birds. General unthriftiness in adults | Dibutyl-tin-dilaurate in feed. Sanitization etc                                                                           |
| <b>Threadworms (nematodes) (Capillaria infection)</b> | <i>Capillaria contorta</i><br><i>Capillaria anatis</i> | Eggs are swallowed, they become adults in the intestine                                                                                       | Decreased appetite, weight loss, loose droppings, regurgitation, and poor plumage                                    | Levamisole, or Pyrantel and Hygromycin                                                                                    |

-A manual of Poultry Diseases

-The Bird Care Book

- A World of pet care, heart worm prevention

-A field manual of wild life diseases -heartworm

-Agents associated with disease in waterfowl

| External Parasites                                                           | Pathogen                                                          | Epidemiology                                                                                             | Effects                                                                                       | treatment                                                                                 |
|------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Fowl tick</b>                                                             | <i>Argas persicus</i>                                             | Eggs laid on host, hatch on host then grow and leave or stay                                             | Unthriftiness, poor growth and anemia                                                         | Insecticides to bird and whole enclosure                                                  |
| <b>Lice</b>                                                                  | Order Mallophaga,                                                 | Live on host, eggs laid in clusters, called nits, attached to feathers spread by contact                 | Restlessness, feather picking, scratching, skin irritation, and feather damage                | Insecticide containing rotenone or pyrethrin, clean and fumigate                          |
| <b>Air sac mites</b>                                                         | <i>Cytodites nudus</i>                                            | Live in respiratory tract, they are coughed up and swallowed, then pass as faecies                       | Poor growth, general weakness, respiratory distress<br>^ higher chance of infection           | No treatment affective                                                                    |
| <b>Depluming Mites</b>                                                       | Feather mites<br><i>Knemidum</i><br><i>Iscvis var. gallinae</i> . | Pierce the skin at base of the feather and live there on host. Transported through contact               | Feather plucking/ breaking, crusts and scabs. Lowered growth rate                             | Spraying dipping or dusting of bird and enclosure in approved insecticides                |
| <b>Red Mites</b>                                                             | Feather mites<br><i>Dermanyssus gallinae</i> .                    | Spread fast, live on host sucking their blood (also spread blood diseases)                               | Poor growth, unthriftiness, anemia, increased cull rate                                       | Spraying dipping or dusting of bird and enclosure in approved insecticides                |
| <b>Subcutaneous Mites</b>                                                    | <i>Laminosioptes cysticola</i>                                    | Live in the skin, subcutis, muscle, abdominal viscera and lungs, forming cysts normally yellow in colour | Birds can live showing no signs, over infection = death                                       | Destroying bird may is the best control for this parasite but ivermectin may be affective |
| <b>The Scaly-Leg Mite</b>                                                    | <i>Knemidocoptes mutans</i> .                                     | Transported through contact, live on featherless areas like legs                                         | Epidermal scales are pushed apart by chalky deposits, irritation, inflammation, unthriftiness | Spraying dipping or dusting of bird and enclosure in approved insecticides                |
| <b>Tropical Fowl Mite (note, only relevant depending on location of zoo)</b> | <i>Ornithonyssus bursa</i> .                                      | Spread fast, live on host sucking their blood (also spread blood diseases)                               | Poor growth, unthriftiness, anemia, increased cull rate                                       | Spraying dipping or dusting of bird and enclosure in approved insecticides                |
| <b>Stickfast flea</b>                                                        | <i>Echinophaga gallinacea</i> .                                   | Attach themselves in clusters around the eyes, eggs fall to ground then hatch, live on hosts blood.      | unthriftiness                                                                                 | Malathion then repeat in 5-7 days, spray enclosure and furnisher also                     |

-A manual of Poultry Diseases

-The Bird Care Book

-Agents associated with disease in waterfowl

-The Merck Veterinary Manual

| Nutritional and metabolic disorders           | Problem                                                                                                   | Epidemiology                                                                                                                                      | Effects                                                                                            | Treatment                                                                                                                        |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Angel wing</b>                             | Overfeeding a diet to high in protein and energy and to low in vitamin E                                  | Progressive lateral (outward) rotation of the distal carpometacarpus                                                                              | Deformity to one or both wings, limb turns outward and they are unable to fly.                     | Restrict protein level to 12-19% never use turkey grower crumbs, feed almost completely greens. Tape wing to body for 2 weeks.   |
| <b>Biotin deficiency (vitamin h)</b>          | Insufficient levels in feed                                                                               | Antibiotics may kill bacteria that Synthesize biotin, presence of biotin antagonists in feed                                                      | Dermatitis, poor growth, brittle feathers, lesions                                                 | Biotin by drinking water then higher levels in feed                                                                              |
| <b>Bumble foot</b>                            | <i>Staphylococcus aureus</i><br><i>Escherichia coli</i><br><i>Proteus spp.</i><br><i>Candida albicans</i> | Contamination of water with large numbers of opportunistic pathogens Faecal / Urine contamination of substrate, vitamin A deficiency              | Swelling or fibrous callus on under surface of foot, sometimes with infection extending up to hock | Suggested local preparations include Preparation H and a mixture of dimethylsulfoxide, dexamethasone and chloromycetin succinate |
| <b>Calcium and Phosphorus deficiency</b>      | Insufficient levels in feed                                                                               | Lack of bone and egg shell formation also no acid-base balance                                                                                    | Rickets, poor egg shell quality, spontaneous fractures of bones                                    | Supplement feed or water                                                                                                         |
| <b>Choline deficiency</b>                     | Insufficient levels in feed                                                                               | Possible lack of choline synthesis                                                                                                                | Poor growth and perosis in goslings                                                                | Supplement feed or water                                                                                                         |
| <b>Folic acid Deficiency (folicin)</b>        | Insufficient levels in feed                                                                               | Stability of folic acid is reduced through pelleting process                                                                                      | Poor growth, feathering and anemia                                                                 | A single injection to fix anemia, higher levels in feed                                                                          |
| <b>Manganese Deficiency (perosis)</b>         | Insufficient levels in feed or diet to high in calcium                                                    | In young birds, shortening and thickening of the leg bones and twisting of the tibia                                                              | Poor growth and perosis, weak with nervous signs, thin egg shells, embryonic deaths                | Supplement feed or water                                                                                                         |
| <b>Nicotinic acid deficiency (niacin def)</b> | Insufficient levels in feed                                                                               | Acid is biologically unavailable, insufficient absorbs ion, excess lucine, argentine and glycine in feed, stress condition requires higher levels | Poor feathering, flightiness, and diarrhea                                                         | Supplement feed with niacin                                                                                                      |
| <b>Pantothenic acid deficiency</b>            | Insufficient levels in feed                                                                               | Is an essential component of co-enzyme A which is needed for many enzymatic reactions                                                             | Retarded growth, rough plumage, lesions around mouth, embryonic mortality                          | Oral administration or injection of pantothenic acid                                                                             |

| <b>Nutritional and metabolic Disorders continued</b>                           | <b>Problem</b>                                                      | <b>Epidemiology</b>                                                                                                       | <b>Effects</b>                                                                                      | <b>Treatment</b>                                                                                             |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Potassium deficiency</b>                                                    | Insufficient levels in feed                                         | Necessary for muscle activity, fluid balance and protein synthesis                                                        | Muscle weakness, poor intestinal tone, weakness of cardiac and respiratory muscles                  | Feed bran, wheat germ, leafy green vegetables and legumes                                                    |
| <b>Pyridoxine deficiency (B6)</b>                                              | Insufficient levels in feed                                         | High protein feed with low vitamin B6 content                                                                             | Low appetite, poor growth, nervous signs                                                            | Administer Pyridoxine                                                                                        |
| <b>Riboflavin Deficiency (Vitamin B2 deficiency)</b>                           | Insufficient animal products and vitamins in diet                   | An essential co-enzyme in many oxidization– reduction reactions involved with carbohydrate metabolism                     | Oral, ocular, co-etaneous and genital lesions, these areas become red, scaly and greasy             | Riboflavin given daily until recovery                                                                        |
| <b>Rickets</b>                                                                 | Imbalanced diet                                                     | Faulty mixing of feeds, low levels of minerals and vitamin D, imbalance of calcium and phosphorous in diet                | Lameness, skeletal deformities and poor growth, loss of condition, dehydration                      | Rebalance diet, administer vitamin D in water, supply calcium and phosphorous ad lib for 5-7 days            |
| <b>Sodium and chloride Deficiency (salt)</b>                                   | Insufficient levels in feed                                         | Plays an important role in muscle contraction, nerve impulse transmission and maintenance of the heart                    | Impaired growth, soft bones, weight loss, cannibalism                                               | Increased salt in feed                                                                                       |
| <b>Selenium/ vitamin E Deficiency (white Muscle Disease, capture myopathy)</b> | Insufficient levels in feed, SE can become unstable in stored feeds | Low content in soil, drugs, high protein, arsnic or linseed can interfere with SE utilization,                            | Myopathy, gizzard damage, increased blood clotting time, lesions on skeletal muscles                | Supplement feed and water with selenium                                                                      |
| <b>Thiamin Deficiency (Vitamin B1 deficiency or polyneuritis )</b>             | Insufficient levels of thiamine or excess levels of thiaminase      | Polyneuritis is the later stages of the deficiency caused by the build up of the intermediates of carbohydrate metabolism | Lethargy, head tumors, decrease in appetite, impaired digestion and general weakness                | In severe cases thiamine must be force fed or injected to induce eating                                      |
| <b>Vitamin A (retinole) Deficiency (bumble foot) (Hypovitaminosis )</b>        | Not enough leafy greens                                             | Endemic to the UK free-range water-fowl, world wide distribution expected                                                 | Swelling or fibrous callus on under surface of foot, sometimes with infection extending up to hock. | Vitamin A or carotenoids are found in dark green leafy vegetables and yellow and orange fruit and vegetables |



| <b>Nutritional and metabolic Disorders continued</b>                               | <b>Problem</b>              | <b>Epidemiology</b>                                   | <b>Effects</b>                                                                                                        | <b>Treatment</b>                                            |
|------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| <b>Vitamin B12 deficiency</b><br>(Cyanocobalamin Deficiency, Cobalamin Deficiency) | Insufficient levels in feed | Congenital Abnormalities<br>(Congenital malformation) | Mid-incubation Embryonic Death<br>Cyanocobalamin Deficiency Slow growth, increased mortality and reduced hatchability | Supplement feed                                             |
| <b>Vitamin K deficiency</b>                                                        | Insufficient levels in feed | Necessary for blood clotting                          | Internal bleeding, anemia, easy bruising, prolonged blood clotting times                                              | Feed whole wheat, oats bran, kale spinach and turnip greens |
| <b>Zink deficiency</b>                                                             | Insufficient levels in feed | High calcium can enhance a Zink deficiency            | Retarded growth, poor feathering, scaling of the skin                                                                 | Replace in feed, feed wheat germ and whole grain            |

- A manual of Poultry Diseases
- Agents associated with disease in waterfowl
- The Merck Veterinary Manual
- Avian Nutrition
- Bumble foot

## Appendix (7) Exotic disease that may be of significance in the future

| Exotic diseases                                                                                            |                                                                                                                                                         |                                                                                                                                                             |                                                                                                                                                                                                                                                |                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Avian Adenovirus (virus)</b>                                                                            | Family Adenoviridae                                                                                                                                     | Adenovirus group 1 has been isolated from Geese but the role of the pathogen is unknown                                                                     | The disease is not a problem in Geese                                                                                                                                                                                                          | There is no vaccine available                                                                                                   |
| <b>Campylobacter Infection (Campylobacteriosis) (zoonotic-possible cause enteritis in man) (bacterial)</b> | <i>Campylobacter</i> spp. <i>Campylobacter jejuni</i> ( <i>Campylobacter fetus</i> var <i>jejuni</i> , <i>Vibrio jejuni</i> , <i>Vibrio hepaticus</i> ) | Bacteria multiplies in the hindgut principally in the caecae                                                                                                | none                                                                                                                                                                                                                                           | Not required on clinical grounds, prevent with good husbandry, clean water etc                                                  |
| <b>Duck Virus Enteritis DVE (virus)</b>                                                                    | caused by a herpes virus                                                                                                                                | recovered are immune to re-infection transmitted directly, by contact between infected and susceptible birds, or indirectly, by contact with a contaminated | environment Lesions, vascular damage (tissue haemorrhages and free blood in the body cavities), vascular eruptions at various locations on the mucosa surface of the gastrointestinal tract, as well as lesions of lymphoid and other tissues. | There is no treatment for DVE but vaccines that are effective have been developed.                                              |
| <b>Duck Viral Hepatitis (virus)</b>                                                                        | Picornaviridae, or Unassigned Astrovirus                                                                                                                | Transmitted through contact with other waterfowl, faeces and brooders                                                                                       | Depression, fall on side, paddling of legs, arcing of back, rapid deterioration, death                                                                                                                                                         | Antiserum, 0.5 mls intramuscularly                                                                                              |
| <b>Fowl Cholera (bacterial)</b>                                                                            | <i>Pasteurella multocida</i>                                                                                                                            | Passed through the nose, mouth and conjuncta                                                                                                                | Mucus discharge from beak, diarrhea, respiratory distress, Internal infection septicemia, death.                                                                                                                                               | Drug treatments, most effective include; Sulphadimethoxine, sulphamezathine, Sulphaquinoxaline chlortetracycline and novobiocin |
| <b>Paratyphoid Infection (Salmonellosis) (Zoonotic) (bacterial)</b>                                        | <i>S. typhimurium</i>                                                                                                                                   | Infected droppings, shell penetration, rodents, contaminated food and environment                                                                           | Weak, ruffled, not eating, emaciated and dehydration in goslings, no apparent signs in adults                                                                                                                                                  | Broad spectrum antibiotics, furazolidone in feed or furaltadone in Water remove all sources of salmonella                       |

## Appendix (8)

### Chemical Restraint in Birds - the following needs to be considered:

1. Birds tend to have a higher metabolic rate and oxygen consumption relative to mammals. Therefore, birds may have a greater requirement for oxygen supplement and assisted respiration than mammals.
2. Birds have far less functional residual capacity than mammals and therefore, apnea (cessation of breathing) will result in death far more quickly.
3. The avian respiratory system, which consists of a pair of relatively fixed lungs and a group of mobile air sacs, is more efficient at gas exchange than mammals. Therefore, birds will often demonstrate a more rapid response to the effects of inhaled anesthetics.
4. Inhalation anesthesia, specifically isoflurane, is presently considered to be the method of choice for most procedures that require general anesthesia in birds.
5. Because of the large volume of stored gases in air sacs, birds can be inefficient at eliminating inhaled anesthetics. Recovery from anesthesia can be facilitated by maintaining the bird in lateral recumbency and turning it every few minutes.
6. In general, injectable anesthetic agents are a poor choice in birds and are used with limited success. Many agents have an unpredictable duration, a rough and prolonged recovery period and serious metabolic effects when used in birds. Birds have a renal portal system and therefore agents injected into the legs may be excreted or metabolized before reaching the systemic circulation. This may act to increase the variability of response to injectable agents.
7. Debilitated or stressed birds are very susceptible to the effects of hypoglycemia which can complicate an anaesthetic procedure.
8. Birds have a high body surface to volume ratio and this will act to exacerbate hypothermia during an anesthetic procedure. Surgery and recovery areas should be sufficiently warm to counteract heat losses.
9. The most reliable indicator of depth of anesthesia in birds is respiratory rate and character. Heart rate varies inversely with the size of the bird and should also be monitored closely.

-Live Animal Capture and Handling Guidelines

## **Appendix (9) How to obtain a license for the import and export of the goose**

### **Licenses to transport animals into and out of NSW**

#### **Importing and exporting animals interstate**

The interstate import and export of fauna is subject to monitoring and regulatory controls by the fauna protection agencies in all states and territories.

Before you import a protected native animal into NSW or export it from the state, you must do the following:

- 1. Check if the animal is exempt from import/export licensing requirements (the Cape Barren Goose is not)**
- 2. Obtain an import/export license from the NPWS**

Interstate import and export licenses are issued for a single consignment of fauna during a maximum period of one month. To apply for a license, download and fill in the application form in. The license fee is \$20. You will find this page if you go to [www.nationalparks.nsw.gov.au](http://www.nationalparks.nsw.gov.au) and click on the 'licences– business' link, then click on the 'plants and animal' link, then the 'trade of native animals and plants' link.

- 3. Make sure that the person in the other state who you are importing from or exporting to, has the appropriate licence or movement permit from their state's fauna protection agency**

You will need to provide details of the other person's licence or movement permit when you apply for an import/export licence from the NPWS. Check the website of the other state's fauna protection agency for more details:

**Australian Capital Territory** <http://www.environment.act.gov.au/>

**Northern Territory** <http://www.nt.gov.au/nreta/parks/>

**Queensland** <http://www.epa.qld.gov.au/>

**South Australia** <http://www.environment.sa.gov.au/>

**Tasmania** <http://www.dpiw.tas.gov.au/inter.nsf/Home/1?Open>

**Victoria** <http://www.nre.vic.gov.au/>

**Western Australia** <http://www.calm.wa.gov.au/>

-[National Parks and Wild Life NSW](#)

-[Quarantine Australia](#)

#### **Importing and exporting animals internationally**

Australia is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). This convention includes a list of species that are endangered, or at risk of becoming endangered, because of inadequate controls over international trade in them or their products. The convention's member countries have agreed to monitor and control the international import and export of these species.

In Australia, CITES controls are administered by the Australian Department of the Environment and Heritage under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*. The Department of Environment and Heritage issues licences for the import and export of CITES-listed species.

**For more information go to;**

**Australian Government** Department of Environment and Heritage

<http://www.deh.gov.au/biodiversity/trade-use/>



## **Appendix (10) Rehabilitation procedures**

### **Treating Shock**

- Caused by severe insult to the bird– trauma, bleeding, fluid loss, infection etc
- Is a syndrome in which the heart and blood vessels are unable to deliver nutrients and oxygen or remove waste from the cells. If not treated promptly it is impossible to release and the bird may die
- Signs of shock– weakness, fluffing up, heavy breathing.
- Do not handle bird excessively, or change its position rapidly (shock may enter the irreversible stage)
- Maintain your bird's body temperature and keep in a quiet still environment
- Call the vet - oxygen, fluids and corticosteroids may be given by the vet.

### **Treating oily birds**

- Bird will lose their insulation when soaked with oil, and may ingest it if they try to preen.
- Warm the bird
- Bathe in solution of one part mild detergent, nine parts warm water (40°C). Stroke the feathers in the direction of their growth, rinse and repeat the strokes till water beads off feathers (usually 4-5 times)
- Place ophthalmic ointment in the bird's eyes
- Wrap the bird to prevent it from preening and keep it warm

### **Treating bleeding or cuts**

- Always pull a feather out if it is bleeding.
- If bleeding isn't stopping, apply direct pressure
- If wound is not too deep, long, or wide it should heal nicely
- Clean wound using warm water and soap after it has stopped bleeding. Three percent hydrogen peroxide can also be used.
- Clean wound daily and apply a topical antibiotic cream or powder.

### **Convulsions and seizures**

- These are temporary disturbances of electrical activity in the brain that may lead to a loss of control of the bird's skeletal muscles
- Signs include the inability to stand, loss of consciousness, and muscle spasms
- Clear area of objects that may harm the bird during spasms
- Try to cover it gently with a towel so it does not injure itself
- Keep light and noise to a minimum and provide warmth (as long as the seizure is not caused by heat stroke)
- Use a dropper to feed sugar and water solution when it can swallow
- Seek veterinary aid if convulsions continue

### **Fractures**

- Signs include not bearing weight on a leg, has a crooked leg or wing, a drooping wing or a piece of bone is protruding the skin (this is a compound fracture and veterinary treatment is needed immediately)
- If it is only a slight fracture it may be possible to splint the fracture yourself; first restrain the bird in a towel or similar
- Gently pull the leg or wing till it is straight again

- For a leg use three layers of adhesive tape over the fracture site then press together at the front and back of the leg.
- Don't be too hasty in splinting a leg unless it is obviously broken. You may be surprised how that bird is standing on its 'broken' leg the next day. It may just be a sprain.
- For a wing fracture, place the tip of the fractured wing on the tip of the normal wing then tape wings to body evenly, ensuring it is not too tight, so the bird can breathe.
- A bone fracture should heal in four weeks if there are no complications

## **Burns**

- Flush area with cold water
- Gently clean the area with sterile gauze
- Extensive burns should be treated by the vet
- Treatment for shock may be required

## **Smoke inhalation**

- Smoke from a fire may contain poisonous gasses from burning plastic or rubber. This means that the smoke not only burns the breathing tubes and air sacs but it poisons the bird as well.
- Remove the bird to fresh air
- Treat the bird for shock
- Seek veterinary aid

## **Heatstroke**

- The bird's body is completely unable to lower its body temperature through normal methods such as panting
- It can occur from a lack of shade or water.
- Signs of heat stroke are heavy panting, extended wings, weakness, a staring expression and collapse
- Give a cold water spray or bath immediately
- Take into an air-conditioned room
- Give the bird a small amount of water
- If taking to the vet, wait for the symptoms to subside, and ensure that the car is well ventilated

-The Bird Care Book

## **Appendix (11) Locations of Pet food suppliers– Petbarn.**

- Alexandria; 175 Mcevoy St (cnr Harley St).....ph. (02) 95578300
- Alexandria; 1-3 Lawrence St (cnr Fountain St).....ph. (02) 95190554
- Belconnen; 42 Belconnen Markets, Lathain St ACT.....ph. (02) 62515329
- Campbelltown; Lot 14 Watsford Rd.....ph. (02) 46272144
- Charmhaven; 6 Botham Close.....ph. (02) 43926743
- Chatswood; Unit 3, 372 Eastern Valley Way.....ph. (02) 94171744
- East Maitland; Unit 2a Corner Chelmsford Drive.....ph. (02) 49339577
- Fyshwick; 80-82 Gladstone St, ACT.....ph. (02) 62800086
- Gosford; 30b Pacific Highway.....ph. (02) 43255455
- Kogarah; 246 Railway Parade.....ph. (02) 95879000
- Moorebank; 124 Newbridge Rd.....ph. (02) 96012911
- Newcastle West; 14-16 Hall St.....ph. (02) 49262006
- Northmead; 5c/6 Boundary Rd.....ph. (02) 96301600
- Penrith; 1/117 Coreen Ave.....ph. (02) 47316044
- Warners Bay; 321 Hillsborough Rd.....ph. (02) 49566522
- Wollongong West; 43 Princess Highway.....ph. (02) 42266595