

# Husbandry Guidelines For Square-Tailed Kites

*Lophoictinia isura*  
**Aves: Accipitridae**



**Compiler: Jadan Hutchings**

**Date of Preparation:** February 2011

Western Sydney Institute of TAFE, Richmond

**Course Name and Number:** Captive Animal Certificate III, 1068

**Lecturer:** Graeme Phipps, Jacki Salkeld, Brad Walker



## Disclaimer

The following information was compiled during the studies of Captive Animals Certificate III at Richmond Collage NSW Australia in 2011 and early 2012.

Since the husbandry guidelines are the result of student project work, care should be taken in the interpretation of information within this document, no responsibility is assumed for any loss or damage that may result from the use of these guidelines.

It is offered to the ASZK Husbandry Manuals Register for the benefit of animal welfare and care. Husbandry guidelines are utility documents and are 'works in progress', so enhancements to these guidelines are invited.

## TASK / MAINTENANCE CALENDER

[illegible]



## WORK HEALTH AND SAFETY RISKS

The Square-Tailed Kite (*Lophoictinia isura*) can be a hazard in some circumstances. In the breeding seasons they can get quite defensive and become a hazard to one self. Using their sharp talons and sharp beak, the Square - tailed kite can swoop down at you and also 'bomb' you, causing injuries to humans whether it's minor or serious. In prevention of this, proper PPE should be worn when dealing with hazardous animals; Long sleeve shirts & head protection should be worn to protect you from any injuries that may occur. When entering the exhibit, a rake should be held in front of you to protect your face in case the animal decides to fly down at you.

If ever handling a Square-Tailed kite for either training or examinations, appropriately trained and confident keepers should be handling the animal, lack of confidence can be a hazard to the keeper or keepers and cause injuries; thick welding gloves should also be worn.

Furniture in the enclosure can also be a WH&S problem. When entering the enclosure always keep an eye out for any sharp/broken perches that keepers or the kites can hurt themselves on. Always look out for any trip hazards and think about if the object should be moved to another location in the exhibit.

Hygiene is important when working with any animal as there is a chance of a zoonotic disease being passed on, wash hands whenever handling the kite.

Chemicals are used regularly in the exhibit such as Disinfectants and Bleach, appropriate PPE such as Goggles and Gloves should be worn for protection (*see MSDS sheets in Appendix*)

# TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION.....</b>	<b>9</b>
1.1	ASMP CATEGORY .....	9
1.2	IUCN CATEGORY .....	9
1.3	EA CATEGORY.....	9
1.4	NZ AND PNG CATEGORIES AND LEGISLATION .....	9
1.5	WILD POPULATION MANAGEMENT .....	9
1.6	SPECIES COORDINATOR .....	10
1.7	STUDBOOK HOLDER.....	10
<b>2</b>	<b>TAXONOMY .....</b>	<b>11</b>
2.1	NOMENCLATURE.....	11
2.2	SUBSPECIES.....	11
2.3	RECENT SYNONYMS.....	11
2.4	OTHER COMMON NAMES.....	11
<b>3</b>	<b>NATURAL HISTORY .....</b>	<b>12</b>
3.1	MORPHOMETRICS .....	12
3.1.1	<i>Mass and Basic Body Measurements.....</i>	<i>12</i>
3.1.2	<i>Sexual Dimorphism.....</i>	<i>12</i>
3.1.3	<i>Distinguishing Features.....</i>	<i>13</i>
3.2	DISTRIBUTION AND HABITAT.....	14
3.3	CONSERVATION STATUS .....	15
3.4	LONGEVITY .....	15
3.4.1	<i>In the Wild .....</i>	<i>15</i>
3.4.2	<i>In Captivity .....</i>	<i>15</i>
3.4.3	<i>Techniques Used to Determine Age in Adults.....</i>	<i>15</i>
<b>4</b>	<b>HOUSING REQUIREMENTS .....</b>	<b>16</b>
4.1	EXHIBIT/ENCLOSURE DESIGN .....	16
4.2	HOLDING AREA DESIGN .....	17
4.3	SPATIAL REQUIREMENTS .....	18
4.4	POSITION OF ENCLOSURES .....	18
4.5	WEATHER PROTECTION .....	18
4.6	TEMPERATURE REQUIREMENTS .....	19
4.7	SUBSTRATE .....	19
4.8	NESTBOXES AND/OR BEDDING MATERIAL.....	19
4.9	ENCLOSURE FURNISHINGS .....	20
<b>5</b>	<b>HYGIENE AND CLEANING.....</b>	<b>22</b>
5.1	RECORD KEEPING .....	23
5.2	METHODS OF IDENTIFICATION .....	23
5.3	ROUTINE DATA COLLECTION.....	24
<b>6</b>	<b>FEEDING REQUIREMENTS.....</b>	<b>25</b>
6.1	DIET IN THE WILD .....	25
6.2	CAPTIVE DIET .....	25
6.3	SUPPLEMENTS.....	27
6.4	PRESENTATION OF FOOD.....	27
<b>7</b>	<b>HANDLING AND TRANSPORT .....</b>	<b>28</b>
7.1	TIMING OF CAPTURE AND HANDLING .....	28
7.2	CATCHING BAGS.....	28

7.3	CAPTURE AND RESTRAINT TECHNIQUES .....	29
7.4	WEIGHING AND EXAMINATION .....	30
7.5	RELEASE .....	30
7.6	TRANSPORT REQUIREMENTS .....	32
7.6.1	Box Design.....	32
7.6.2	Furnishings.....	34
7.6.3	Water and Food.....	34
7.6.4	Animals per Box.....	34
7.6.5	Timing of Transportation.....	34
7.6.6	Release from Box.....	34
<b>8</b>	<b>HEALTH REQUIREMENTS.....</b>	<b>35</b>
8.1	DAILY HEALTH CHECKS .....	35
8.2	DETAILED PHYSICAL EXAMINATION.....	35
8.2.1	Chemical Restraint .....	35
8.2.2	Physical Examination.....	36
8.3	ROUTINE TREATMENTS.....	37
8.4	KNOWN HEALTH PROBLEMS.....	38
8.5	QUARANTINE REQUIREMENTS .....	43
<b>9</b>	<b>BEHAVIOUR.....</b>	<b>44</b>
9.1	ACTIVITY .....	44
9.2	SOCIAL BEHAVIOUR.....	44
9.3	REPRODUCTIVE BEHAVIOUR.....	44
9.4	BATHING.....	45
9.5	BEHAVIOURAL PROBLEMS .....	46
9.6	SIGNS OF STRESS.....	46
9.7	BEHAVIOURAL ENRICHMENT .....	47
9.8	INTRODUCTIONS AND REMOVALS .....	48
9.9	INTRASPECIFIC COMPATIBILITY .....	48
9.10	INTERSPECIFIC COMPATIBILITY.....	48
9.11	SUITABILITY TO CAPTIVITY .....	48
<b>10</b>	<b>BREEDING .....</b>	<b>49</b>
10.1	MATING SYSTEM.....	49
10.2	EASE OF BREEDING .....	49
10.3	REPRODUCTIVE CONDITION .....	49
10.3.1	Females.....	49
10.3.2	Males.....	49
10.4	TECHNIQUES USED TO CONTROL BREEDING .....	50
10.5	OCCURRENCE OF HYBRIDS.....	50
10.6	TIMING OF BREEDING.....	51
10.7	AGE AT FIRST BREEDING AND LAST BREEDING .....	51
10.8	ABILITY TO BREED EVERY YEAR .....	51
10.9	ABILITY TO BREED MORE THAN ONCE PER YEAR .....	51
10.10	NESTING, HOLLOW OR OTHER REQUIREMENTS.....	52
10.11	BREEDING DIET.....	54
10.12	INCUBATION PERIOD .....	54
10.13	CLUTCH SIZE.....	54
10.14	AGE AT FLEDGING.....	55
10.15	AGE OF REMOVAL FROM PARENTS.....	55
10.16	GROWTH AND DEVELOPMENT.....	55
<b>11</b>	<b>. ARTIFICIAL REARING.....</b>	<b>57</b>
11.1	INCUBATOR TYPE.....	57
11.2	INCUBATION TEMPERATURES AND HUMIDITY.....	57

11.3	DESIRED % EGG MASS LOSS .....	57
11.4	HATCHING TEMPERATURE AND HUMIDITY .....	58
11.5	NORMAL PIP TO HATCH INTERVAL .....	58
11.6	BROODER TYPES/DESIGN .....	58
11.7	BROODER TEMPERATURES .....	59
11.8	DIET AND FEEDING ROUTINE .....	60
11.9	SPECIFIC REQUIREMENTS .....	60
11.10	PINIONING REQUIREMENTS .....	60
11.11	DATA RECORDING.....	61
11.12	IDENTIFICATION METHODS .....	61
11.13	HYGIENE .....	61
11.14	BEHAVIOURAL CONSIDERATIONS .....	62
11.15	USE OF FOSTER SPECIES .....	62
11.16	WEANING .....	62
11.17	REHABILITATION PROCEDURES.....	63
<b>12</b>	<b>ACKNOWLEDGEMENTS.....</b>	<b>64</b>
<b>13</b>	<b>REFERENCES.....</b>	<b>65</b>
<b>14</b>	<b>BIBLIOGRAPHY .....</b>	<b>67</b>
<b>15</b>	<b>GLOSSARY .....</b>	<b>68</b>
<b>16</b>	<b>APPENDIX.....</b>	<b>69</b>

# 1 Introduction

The Square – Tailed Kite (*Lophoictinia isura*) is commonly found soaring high up in the sky, on the lookout for chicks in canopies over forest and bush land. They are commonly spotted in the wild by their prominent Square Tail, low soaring and their plaintive yelp they emit. Unfortunately there are very little being housed in captivity, according to the International Species Information System and The regional Census and Plan 2011 there are no Square tailed kites being housed in captivity. Institutes like Featherdale Wildlife Park who are not a part of Zoo associations, currently house two S – T Kites, therefore any private facilities that house these kites have not recorded their collection for their own reasons.

Bringing more of these Kites into captivity would help for future population as in some states of Australia they are listed as Endangered and Threatened, although the overall status is Least Concerned. Being the only species in its Genus, it is a quite unique Bird of Prey and would be great for Free Flight Bird Shows considering their beauty and features.

## 1.1 ASMP Category

N/A

## 1.2 IUCN Category

Least concern (LC)

### Lophoictinia isura



## 1.3 EA Category

N/A

## 1.4 NZ and PNG Categories and Legislation

N/A

## 1.5 Wild Population Management

N/A

## **1.6 *Species Coordinator***

N/A

## **1.7 *Studbook Holder***

N/A

## **2 Taxonomy**

The Square-Tailed Kite (*Lophoictinia isura* (Gould 1838) belongs to the family Accipitridae and is an Endemic Australian Species and Genus. The kite previously belonged to the *Milvus* genus and then was placed in the genus *Lophoictinia*. The diurnal Bird of prey is the only member of this genus at present.

In Greek, *Lophoictinia* means ‘a crest & kite’ and *Isura* refers to the square or even tail; ‘Equal Tail’ (HANZAB)

### **2.1 Nomenclature**

**Class:** Aves

**Order:** Falconiformes

**Family:** Accipitridae

**Genus:** *Lophoictinia*

**Species:** *isura*

### **2.2 Subspecies**

There are no Subspecies

### **2.3 Recent Synonyms**

The Square-Tailed Kites previous scientific name was *Milvus isurus* (Gould1838)

### **2.4 Other Common Names**

The Square-Tailed Kite is also known by the name of *Long-Winged Kite*. (HANZAB)

### 3 Natural History

The Square-tailed Kite (*Lophoictinia isura*) is a medium sized raptor native to Mainland Australia; they can be found in open Eucalypt forest and Woodlands, and occasionally can be found around Sub Tropical Rainforest. The kite can spend several hours soaring above open woodlands, scrubs and forest. Adult birds have a reddish brown appearance with a white face and thick black streaks on the crown, elsewhere has thin black streaks.

The Square-Tailed Kite is a quiet bird but will let out a plaintive yelp and weak twitter when about to perch or near its nest. They primarily feed on small chicks (passerines primarily) that they pull out of the nest in open canopies and occasionally Reptiles, Small Mammals, and large insects.

The Square-Tailed Kite will build 2 large stick platforms only in a living eucalypt tree; they will lay a clutch of up to 2 eggs in winter in the nest they have chosen and only attempt this once a year. The eggs are incubated for 37 - 42 days and the nesting period is 8 weeks. Each year the kite will rotate each nest that was built the previous season and reproduce again.

#### 3.1 Morphometrics

##### 3.1.1 Mass and Basic Body Measurements

Length: 50-56cm

Wingspan: 130-145cm

Weight: Male 500grams

Female 635grams

(Cupper & Cupper)

##### 3.1.2 Sexual Dimorphism

The Square-Tailed kites are Monomorphic in colour. By looking at the 2 next to each other you will notice females are larger than the males (females 50-56cm – Males 50-54cm) (*John Young Wildlife Enterprises*)

DNA secondary feather testing should be done to determine males and females accurately.



### 3.1.3 Distinguishing Features

The Adult Square-Tailed Kite is a reddish/rufous brown on the underbody with black streaks and pale white around the eyes and beak, the under wing has colouring of rufous and white; the under tail has white. The upper body is darker than the underbody, darker red/brown coloring with black streaks along the wings and back with a thick white streak going across the wings. The Beak is pale at the base then grows darker towards the tip; the legs are short and pale.

The Square-Tailed Kite name is given to its tail shape. Unlike most Kites that normally have a forked shaped tail, The Square-tailed kite has a unique square shaped tail that distinguishes it in flight.

Figure 1



(Figure 1 shows a Square-Tailed Kite in mid-flight on the left (Julian Robinson 2008) and a Square-Tailed Kite Perched on the Right (Ian Montgomery 2011))

The Square-Tailed Kite is often mistaken for the Juvenile Black Breasted Buzzard (*Hamirostra melanosternon*), Little Eagle (*Hieraaetus morphnoides*) and the Whistling Kite (*Haliastur sphenurus*). In flight the Square-tailed kite is mistaken for the Whistling kite considering the under wing pattern is very similar, the main difference is the shape of the tail. The Whistling kite has a forked shaped tail where as the Square-Tailed Kite has a square shaped tail.

The Little eagle has nearly the same colouring but is more heavily built and a little darker than the Kite, Little eagles also have feathers running all the way down their leg.

The immature form of the Black breasted buzzard looks identical to the Square-Tail but is a little darker in colour also.

*Figure 2*



*(Figure 2 shows A Little Eagle on the Left (Hutchings, J 2011), A Juvenile Black Breasted Buzzard in the middle (Julian Robinson 2008) and a Whistling Kite on the Right (Hutchings, J 2011))*

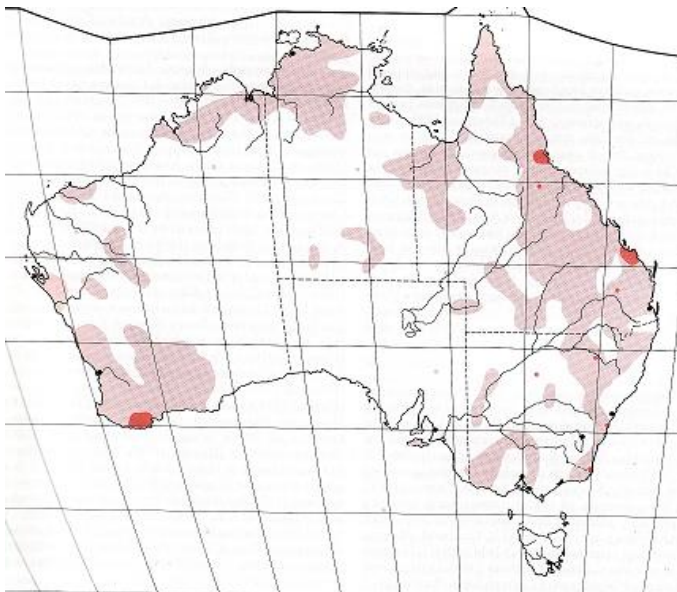
### **3.2 Distribution and Habitat**

The Square-Tailed Kite habituates to coastal and Sub coastal regions from South West, North, North East, and North West Australia, Square-Tailed Kite can also be found in the center of Australia, with very few found in South Australia. (NSW DEC). The Range is large but numbers are declining in the Eastern and Southern Areas of Australia. In New South Wales, the Square-Tailed Kite has been known to be a permanent resident, especially in the north and north-east.


The Square-Tailed Kites are found in open Eucalypt woodlands and Open Forest along water courses. Primarily found only where eucalypt woodlands are live, rarely would you see Square-Tailed Kites around Inland dry, Treeless areas or high alpine regions.

In the winter months Square Tailed Kites Usually migrate up North to follow the Honey Eaters for their breeding season, considering that passerine chicks are there primary food source. *(John Young Wildlife Enterprises)*

*Figure 3*



*(Figure 3 Shows the Distribution of the Square Tailed Kite around Australia)*

 - The Range and Distribution of the Square-Tailed Kite (HANZAB)

### **3.3 Conservation Status**

According to the IUCN Red Listed Criteria, The Square-Tailed Kite is listed as Least Concerned (LC) in Australia.

But in certain states they have been listed as differently:

- Queensland (rare)
- New South Wales (Vulnerable)
- Victoria (Vulnerable)
- South Australia (Endangered)
- Western Australia (Vulnerable)
- Northern Territory (Vulnerable)

([www.birdsaustralia.com.au](http://www.birdsaustralia.com.au))

Previous conservation status according to the ICUN:

2008 – Least Concern

2004 – Least Concern

1996 – Vulnerable

1994 – Vulnerable

### **3.4 Longevity**

#### **3.4.1 In the Wild**

The Maximum age of a Square-Tailed Kite in the wild has been recorded to live 17 years of age. (HAGR)

#### **3.4.2 In Captivity**

In Captivity Square-Tailed Kites can reach a little older than the 17 year old life expectancy.

Depending on the circumstances, if the Kite has permanent injuries, it might not reach 17 years of age, if it's a healthy bird with no injuries it can out live 17 years. There are no records to say exactly how old Square-Tailed Kites can reach in captivity because there are very few kept (ISIS)

In captivity all animals should be fed the best quality foods, this can lower the risk of diseases, sickness and increase more years into the animal's lifespan. (DEC)

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

In adult Kites there are no ways you can determine their age. The best way to age them is Record Keeping. Doing this can give you exact days they were born (if born in captivity), otherwise if brought into the Zoo or Wildlife Park as a donation, record keeping should start as soon as it comes in. If the Kite comes in as a chick fallen out of the nest then you can estimate its age by pin feathers, size and weight.

## 4 Housing Requirements

### **EAPA Standards for Exhibiting Captive Raptors in New South Wales 1995:**

- 1) Raptors shall not be enclosed in walk-through aviaries. If the Director-General is Satisfied that visitors will not be attacked, exemption to this requirement may be Granted.
- 2) Enclosures shall be constructed of such materials and be maintained in sufficiently good repair to ensure that they will contain the animals at all times and are to be safe for the animals, for the staff attending them and for the public
- 3) Enclosures shall include a covered shelter, enclosed by weatherproof walls which provide roost security and protection from wind, rain and extremes in temperature and sunlight.
- 4) Enclosures for raptors shall include a water mist spray or allow the birds access to rain.
- 5) Enclosures shall be well drained and have either a readily cleanable substrate or be of a material which can be replaced to avoid the accumulation of faeces, urates, fungi and molds.
- 6) Access to raptor enclosures should be through a double door safety entrance. Doors are to be self-closing and locked upon exiting

### **4.1 Exhibit/Enclosure Design**

The design of the exhibit should be as natural as possible. The Kite will need access to Wind, Rain, Shelter, Sun and Fresh air.

Shelter can be constructed at the back of the exhibit with corrugated iron, Colour Bond or any other materials that will keep the kite shaded, dry and relaxed with a suitable way to hide. You can also have vines growing over the top of the exhibit to keep the exhibit cool but still allowing sun to peak through of a day time and rain to fall through in wet weather. *(pers.comm)*

The enclosure should be constructed of materials that will not harm the raptor if it flies into it.

Chicken wire should not be used as it is not strong and can injure the birds. Glass should **NEVER** be used in raptor exhibits as they will try and escape and fly into the glass causing death.

*(pers.comm)*

Thick Gauge wire is the most commonly used material for raptor enclosures, although some parks and zoos like to use Knotless nylon Netting *(pers.comm)* *(more information refer to appendix)*

Always design the enclosure with ease of maintenance in mind and vermin control, always ensure an air locking system is in place on the enclosure so maintenance can be performed easier and the kite cannot escape. *(pers.comm)*

There can be many different forms of substrates used on the enclosure floor; Refer to section 4.7 Substrate for more information.

In my experience I have found that Native Flora is an essential part of the exhibit design, you want your raptor living in the best condition in captivity and being enriched to greater lengths; Below is a list of flora I have found that can work well with any raptor.

- Mixed Grass Tussock species
- Lomandra species
- Variety of eucalypt
- Tea-Tree species
- Bamboo
- Ferns species
- Melaleuca species

Native Flora to the areas Square – Tailed Kite are distributed can be added into the exhibit, be sure to research if the plant can be a hazard to the kite or not due to poisons..

Plants like Oleanders contain a Toxin called Cardenolide Glycosides which is mostly found in the Sap, and if any human or animal ingest the sap or inhales the burning fumes it can be extremely fatal.

*(refer to Appendix for a useful Horticultural Database)*

## **4.2 Holding Area Design**

Holding areas for Square – Tailed Kites can be basic but similar to the exhibited enclosure. Holding areas which are normally found in Quarantine need to allow enough room for the kite to freely move around and expand their wings. The cages should also have an air locking system; this will prevent the birds from escaping, considering the holding areas are much smaller than the exhibited enclosure. A holding enclosure size of 1.5m x 2m x 2.5m is suited for one adult Square – Tailed Kite. Making the holding cage easy to clean is important, Featherdale Wildlife Park keepers have found it easier to split half the enclosure into a sand substrate closest to the door where the feeding station will be, and a cement base furthest away from the door. This way the old food can easily be raked out in the morning and the cement can be cleaned with a hose each morning to remove faeces.

*Figure 4*



*Figure 5*



*(Figure 4 shows a suitable holding cage for S-T kites at FWP  
Figure 5 shows an air locking system on holding cages at FWP  
Photos by Hutchings, J 2011)*



### **4.3 Spatial Requirements**

The Minimum standards for an Exhibited Enclosure housing Square – Tailed Kites should be 3m Wide x 8m Long x 4m High , as set by the Exhibited Animals Protections Act (*Standards for Exhibiting Captive Raptors in New South Wales*).

### **4.4 Position of Enclosures**

Always make sure you position the enclosure north and away from any other animals that would normally predate the kite in the wild.

The Enclosure should be positioned so the Kites are getting sunlight in the morning and shade in the afternoon; this is so the kites do not over heat in the afternoon when the sun is at its highest peak.

The roofed area should be in a position to protect the birds from rain and wind coming from the South West.

### **4.5 Weather Protection**

An area, preferably at the back of the exhibit should be enclosed on the top and sides of the enclosure with either corrugated iron or colourbond to protect the birds from rain, high winds, and to offer shade when needed. Nesting platforms should also be placed under the shelter, along with perches. Mist sprinklers can be placed either inside the exhibit or on the roof; this will allow a cooler area during the hotter times of the year. Sprinklers on the roof will help cool down the iron or other roofing material when it gets hot. Never leave sprinklers on for too long, having them on for long periods of time will create humidity in the enclosure and will cause more stress to the bird. It is best to have it on for 5 minutes at a time throughout the day.

*Figure 6*



*Figure 6 shows weather protected Areas In the S – T kite enclosure at FWP*

*Photo by Hutchings, J 2011*

## 4.6 Temperature Requirements

The Square – Tailed Kites body temperature is between 40°C and 42°C.

Temperatures exceeding that degree can be fatal or cause heat exhaustion; mist sprinklers that are fitted on the roof of the enclosure should be put on several times a day for a short period of time to cool down the bird, Drinking water should be changed throughout the day to offer fresh cold drinking facilities. (*pers.comm Mitchell Bentley Featherdale Wildlife Park*)

When temperatures drop below 0°C, the kite should get an artificial heat source to keep it warm for survival. (*Lori R.Arent*)

## 4.7 Substrate

Considering Square – Tailed Kites are found around open woodlands and Eucalypt forest, you want the most natural design in the exhibit, and the most enriching substrate. You can use a variety of Wood chips, sand, soil or grass, but in my experience I have found soil with mulch spread over has been the most efficient substrate. At Featherdale Wildlife Park old koala branches are mulched and laid out in all different enclosures; it is aesthetically pleasing, natural, cheap and easily cleaned. Mulch will also provide enrichment to the bird's life in captivity as it allows them to pick through the mulch and find worms and insects. Soil will allow live plants to grow in the exhibit to create a more natural habitat and allow support for branches that are planted in the ground. Cement would not be the best flooring to use considering it is not natural; the birds cannot pick at it and will provide no enrichment what so ever. Faeces will get stuck and heavy maintenance would need to be undertaken to the exhibits floor on a daily basis for appropriate hygiene.

## 4.8 Nestboxes and/or Bedding Material

Featherdale Wildlife Park provides a nesting platform for the Square – Tailed Kites, The platform should be no more than 500mm in diameter and should be at least 3m from the ground for successful breeding in captivity (*pers.comm Mitchell Bentley, Featherdale Wildlife Park*). Natural browse and twigs can be lined in the nest by man, but can also be added into the enclosure to encourage the birds to add to the nest.

*Figure 7*



*Figure 7 shows a man-made nest in the S- T kite's enclosure at FWP  
Photo by Hutchings, J 2011*

## 4.9 Enclosure Furnishings

- The total number of perches and/or ledges shall outnumber the number of birds in an aviary.
  - Perches/ledges should be placed so as to encourage the raptors to make maximum use of the flight possibilities within the enclosure. At least one perch should be no less than two (2) meters from the ground.
  - All perches/ledges/tree stumps shall be placed so that birds can perch comfortably without their plumage coming into contact with walls or fixtures
  - An aviary for the housing of raptors shall contain a bathing pond/container with a diameter sufficient to allow normal bathing behaviour and a depth not greater than 15cm and not less than 5cm
  - Perches shall be constructed from uncontaminated natural branches and vary in diameter and cross-section so that at least some shall have circumferences not less
  - Enclosures containing raptors which are incapable of normal flight should include rough-barked branches which permit the birds to climb to perches from the substrate
- (EAPA Standards for Exhibiting Captive Raptors in New South Wales)*

Natural features in the exhibit create an aesthetically pleasing look and enrich the bird's life in captivity.

Natural eucalypt and any other species of native trees can be used as perches. Native plants and trees can be used in the exhibit. Keep in mind that Square – Tailed kites are found around Eucalypt forest and woodlands so use trees that are found around those regions. Logs and Rocks can be added to the exhibit floor as extra furnishing for the kites, but keep in mind not to clutter the exhibit.

A nesting platform should be provided 3 meters from the ground, always keep in mind to place all nesting platform under the sheltered area, with at least 1 perch.

Water bowls can be man-made with rocks and cement, you can also use mock rock or Ceramic bowls; For an aesthetic look, I recommend man- made rock bowls.

You will also need to add a Signage card to the front of the enclosure, The minimal standards that need to be displayed on the card (according to the Department of Industry and Investment (DII)) is the Animals Common name, animals Scientific name, a Distribution map, and a photo of the animal. It is advised to go one step further and add a few interesting facts about the animal.



(The 2 Square - Tailed Kites being housed at Featherdale Wildlife Park both have wing injuries, Paper barked trees are planted so the birds can climb up and perch at any time. The EAPA standards states that any raptors in captivity that have no access to flying need paper barked perches)

*Figure 8*



*Figure 9*



*Figure 10*



***Figure 8*** show the inside of the S - T Kite enclosure at FWP

***Figure 9*** shows the front of the S – T Kite enclosure at FWP

***Figure 10*** shows the side of the S – T Kite enclosure at FWP

*Photos taken by Hutchings, J 2011*

## 5 Hygiene and Cleaning

Hygiene and Cleaning are very important when housing any animal in captivity. Procedures should be carried out on a Daily, Weekly, Monthly, and Annual basis. If very little attention is applied to the animals and the exhibit, you will be setting a poor example for the Wildlife Park or Zoo, as well as harming the animal.

### **Featherdale Wildlife Parks Procedures:**

**Daily-** On a daily basis, keepers at Featherdale Wildlife Park give fresh water from a tap to all the animals in the morning. If it is a hot day the water gets changed several times a day so the animals are offered fresh cold drinking water. Keepers hose off all faeces and urates off rocks, plants, perches and logs with a High pressure jet nozzle attachment for a hose. All old food from the day before is removed from every enclosure and offered to goannas and scavenging animals. The feed stump is hosed off with a high pressure hose and moved around the enclosure ensuring it is not directly under perches etc.

**Weekly-** On a weekly basis, the whole enclosure is raked lightly to remove feathers and old foods that may have been buried under mulch. The mulch is mixed up with a rake and re spread to give a fresher look to the exhibit. Once a week the water bowls and feed stumps are bleached with Eclipse Liquid Chlorine (1 part of bleach to 1 part of water). The bowls and feed stumps get a small amount of diluted bleach splashed onto them and scrubbed with a long handled scrubbing brush, and then blasted with water using a high pressure nozzle attachment attached to a hose to remove all bleach.

**Monthly-** On a monthly basis the whole enclosure is given a heavy rake to remove all substrate, the soil is then scarified and fresh new mulch is laid down. The stump will be replaced if it is in poor condition (breaking apart or looking inadequate). All plantations in the exhibit are cut back so it does not over grow, for pleasing aesthetics.

All perches and logs are scrubbed with disinfectant, and are also checked for any pest infestation. If there are any infestations the perches and logs are sprayed with a non-toxic insect spray.

The nesting platforms are changed with new branches of eucalypt browse (only in non-breeding seasons, so there is no disturbance for breeding). Corrugated Iron panels are disinfected and scrubbed to remove any faeces. If any rat or mice holes are dug in the enclosure, Racumin<sup>®</sup> Rat and Mouse Poison is put down the holes and the holes are re-covered with dirt, then mulch.

**Bi Annually-** This time of year the kites should be given a Physical Examination (refer to section 8 Health Requirements). While the kites have been caught up it's a great time to repeat the duties that happen on a monthly basis (as above).

**Yearly- Never perform yearly cleaning when the kites are nesting, or rearing young.**

On a yearly basis the whole enclosure is cleaned from top to bottom. The kites are caught up (refer to sections 7.3 of the Husbandry Manual for capture and restrain techniques) and placed into a box or pet pack and are placed in a dark quiet area to lower stress levels. This is a perfect time to undertake full examinations of the kite. All perches, stumps, and logs are replaced, the substrate is removed and the soil is scarified. Plantation is cut back and if needed new plants are planted. All Nesting platforms are changed and cleaned, with new browse weaved throughout the nest. All iron panels are disinfected, scrubbed and hosed off. If the wire is grey or the black paint has faded or removed, the wire around the exhibit will be re sprayed with black paint to give the enclosure a fresh look. If there is any rusted or broken wire, the panel will then be replaced. Once the enclosure has been fully maintained, new perches have been securely bolted in, new mulch has been laid and new furnishing has been added, you can release the birds back into the exhibit (refer to sections 7.6.6 of the Husbandry Manual Release from box). Make sure to keep an eye on the kites for the rest of the day.

## **5.1 Record Keeping**

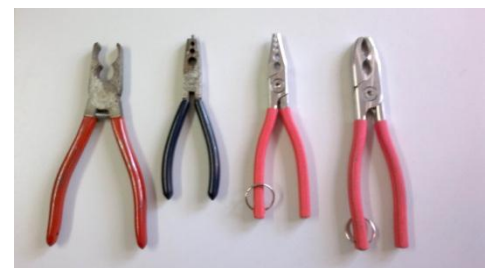
Record Keeping is an important role within all captive animal facilities. All records that relate to the animals Health, Change in diet, Behavioral Problems, Veterinary examinations, Veterinary Treatments, Movements within and between the facility, Reproductive Behaviors, Reproduction, weight & lengths, and Acquisition should be all recorded with Daily diaries, Keeper Diaries, Record Data Sheets and/or ISIS (International Species Information System). Records need to be done so the history of the animal is in written text or digitally recorded and can always be look back at and shared. (*pers.comm*)

## **5.2 Methods of Identification**

Methods of Identification for the Square-Tailed Kite can be quite easy in captivity, if the correct methods of identifying are in place. In most cases you can look at the bird and identify it by individual characteristics and features.

If the Sex of the animal is unknown, DNA blood testing or Secondary Feather testing can be undertaken by a scientific lab.

Leg Bands are the main way to visibly identify many species of captive birds. You can purchase different colour leg bands which can make it easier to differentiate between the sexes and individuals. Usually the band goes on the right leg for Males and left leg for Females. Leg bands can also have numbers and/or letters on them; This is the I.D code. Normally the I.D code is only used when there is a large number of the same species being housed in the 1 exhibit. Proper Leg Banding pliers are used for certain sized rings and only a keeper that has been trained to leg band should only do so as it may possibly go wrong and can injure the bird's tarsus. (*Pers.comm*)



*Figure 11*

*(Figure 11 shows leg banding pliers (photo by Hutchings, J 2011))*

Micro chipping can also be used in Raptors. Usually the chip is implanted in the raptors chest. When determining the identity of the raptor, a micro chipping scanner is scanned across the chest until the chip number is picked up, and usually the chip number is on a record with the history of the raptor.

*(Falcon Veterinary Group)*

*Figure 12*



*(Figure 12 shows a microchip implanter and a microchip scanner (photo by Hutchings, J 2011))*

### **5.3 Routine Data Collection**

Routine Data collection is important in adults and young birds. If the adult bird is ill and veterinary treatment is being applied, daily data and records should be written down. This way you can look back and see if there has been any progress or deterioration following the treatment. When raising an altricial chick routine data collection is advised, noting down when new feathers have grown, if the bird has gained weight, how much it is eating or if any treatment is being given, this will all aid in the success of rearing your chick.

*(See Appendix for Bird Hand Raising Chart)*



## 6 Feeding Requirements

### EAPA Standards for Exhibiting Captive Raptors in New South Wales 1995:

- Suitable whole animals shall provide at least 50% of the nutritional and energy requirements of raptor.
- Suitable bird species shall provide at least 60% of the dietary requirements of birds of the Accipiter and Erythroriorchis genera and bird-hunting species of the Falco genera
- Mammal and bird specimens less than ten(10) weeks of age shall not form more than 25% by weight of the diet fed to raptors in any one week.
- Except on starve days, a sufficient quantity of food shall be provided daily so that there is some left over each day.
- Raptors may be given no more than one starve day per week and there shall be at least three (3) days between any two starve days.
- Food supplied to raptors shall be clean and fresh, obtained from a reliable source and, preferably, bred under laboratory conditions

### 6.1 Diet in the Wild

Square – Tailed Kites primarily hunt early mornings and late afternoons, they feast on chicks (primarily Passerines), foliage insects, small mammals, reptiles, amphibians, and Carrion. (*Debus & Czechura 1989*).

The Kites are characterized as a ‘tree top harrier’ (*P.Slater*), soaring above and through forest canopy’s feasting on un-hatched Chicks, young hatched chicks, and also small birds (*lea & Grey*). During the breeding season for the kites, they have been known to rob bird nest for chicks and eggs, often removing the whole nest. The kite can take 1 nest on each foot and return it to its own. Square – Tailed Kites often skim over long grass, in search for small reptiles, rabbits and rodents (*Debus & Czechura 1989*).

Hunting methods of the Square – Tailed Kite include Low slow-quartering and transect hunting, plunging after prey with legs extended and wings held high (*G. Holmes*)

### 6.2 Captive Diet

In captivity Square – Tailed Kites need to be provided with the same diet they would out in the wild. Although it is illegal to feed live mammals in captivity, Square – Tailed Kites gets fresh de – frosted food that has been humanely euthanized.

Foods such as Day old chickens (*Purchased by Cordina Chicken farm*), domestic mice & rats, wild rabbit, chicken pieces, diced beef pieces, emu, kangaroo, beef hearts and large game items such as, pig & goat can be fed out in captivity to the kites. Not only meats should be fed to the Kites; the flesh, fur, bones and organs of the animals should also be fed to allow the kite to eat what it would out in the wild. This way it is ingesting a good balance of Vitamins, Minerals, and enough calories it would need to survive. All raptors will bring up a ‘Casting’ a few days after eating. The casting consists of indigestible materials such as fur and bone. (*Arent, Lori R*).

### Preparation:

In preparation for feeding these raptors, at Featherdale Wildlife Park, keepers cut any sorts of meat into small portions the size of a Day Old Chicken. All meats that have been de - frosted in the cool room overnight are de-frosted separately to reduce the likelihood of cross contamination.

Keepers at Featherdale cut up all meats at 2pm making sure all items are ready to be fed out on the Carnivorous feed run that commences at 3.30pm. More than one variety of meat should be fed out daily to captive raptors. Featherdale Wildlife Park receives large game items cut into large portions, keepers then have to cut small portions equivalent to 1 Day old Chicken size. Hearts, Beefs and Chicken pieces are again cut up into day old Chicken size on a chopping board in the food prep room; the meats are then placed into buckets and put into the cool room until they are ready to be fed out.

### How much to feed Captive Raptors

*Table 1*

WEIGHT OF RAPTOR	FOOD REQUIREMENTS
500 grams and over	10%- 12% of body weight per day
Under 500 grams	15%- 20% of body weight per day
Under 250 gram	20%- 30% of body weight per day

*(Table 1 shows a figure of what can be fed to any captive raptor as a minimum)*

*(Sharon K Blair: Raptor Fact Sheet, 1993)*

This rule above does not apply for breeding season. When the raptor is raising chicks or is incubating eggs, the food requirements increase; when breeding seasons finish, the food requirements decrease (*refer to section 10.11 tables 3 for breeding diet*).

At Featherdale Wildlife Park, adult Square - Tailed Kites get fed an equivalent amount to 3x Day old chickens per day which is approx. 129 grams, every Sunday at Featherdale is a starve day for raptors, and Wednesday is a half day. EAPA standards allow 1 day per week to starve the raptor. Weather conditions can alternate the amount of food given to the birds; if it is raining, food will decrease to 43 – 86 grams per adult Square – Tailed Kite, and this is because in the wild all prey items will be under shelter hidden from the weather, therefore hidden from predators.

### Weekly Diet for the One Adult Square – Tailed Kite at Featherdale Wildlife Park

*Table 2*

Day	How much is being fed?	What is being fed?
<b>Sunday</b>	Starve day - 0 grams	-----
<b>Monday</b>	129 grams	Mix of Day old Chickens, Rabbit, and Diced Beef
<b>Tuesday</b>	86 grams	Mix of Beef Heart, and Diced Beef
<b>Wednesday</b>	64.5 grams	Day old Chickens
<b>Thursday</b>	129 grams	Mix of rabbit, game meats, and Chicken pieces
<b>Friday</b>	129 grams	Mix of Day old Chickens, and Beef Pieces
<b>Saturday</b>	129 grams	Mix of Chicken Pieces, game meats and Day old Chickens.

*(Table 2 shows the weekly diet for 1 adult S-T Kite)*

*Figure 13*



*(Figure 13 shows day old Chickens, and Rabbit being fed out on a feed stump to Square – Tailed Kites at Featherdale Wildlife Park, Photo by Hutchings, J 2011)*

### **6.3 Supplements**

Supplements in a diet of captive raptors are important, considering de – frosted foods are fed out and some vitamins, minerals and calcium can be lost in the freezing process of the meats.

Supplementing the lost nutrients is important. Calcium Powder or Petvite can be sprinkled on the meats in preparation for feeding the Kite.

Approximately 5 grams of Calcium powder and/or Petvite should be sprinkled on the meat.

*(Pers.Comm James Fong Featherdale Wildlife Park Keeper)*

### **6.4 Presentation of Food**

When feeding Square – Tailed Kites, providing behavioral enrichment is very important to the kite and its life in captivity.

Featherdale Wildlife Park has short wooden stumps placed in all raptor exhibits that the food is placed on (*as seen above in figure 13*). Each day the feed stumps are hosed off with a high pressure hose attachment, and weekly the stumps are bleached and hosed off, this way the stumps are clean and bacteria free.

In the wild Square – Tailed Kites do not eat from the 1 spot every day, so as enrichment; keepers move the feed stump around the exhibit to different spots.

Food is also hidden next to planation in the exhibit for the raptor to find it, as well as placed on perches and on plates around the exhibit in different locations.

## 7 Handling and Transport

Square – Tailed Kites are capable of causing injuries to keepers. They have sharp talons and a strong beak so always keep in mind WH&S. Appropriate PPE such as jumpers, safety glasses and a hat may be worn to prevent injuries. Welder Gauntlets may also be worn, but keepers find them a nuisance as it can reduce the grip you have on the bird during restrain.

When catching the bird you need to make sure not to cause any injuries to the birds wings, if you damage the wing when capturing this can result in injuries and could permanently restrain the bird from flight.

### 7.1 Timing of Capture and Handling

When catching or handling the Square – Tailed Kite, the best time to do so is in the morning. This is because the park hasn't opened to the public yet; therefore there will be no visitors around the exhibit stressing the birds out.

If anything were to go wrong in the capture, you have the rest of the day to resolve it.

Morning is always the coolest part of the day, so catching the bird in the morning will be more successful then catching it in mid-day when the temperature has risen. Catching animals in warmer conditions is more stressful to the animal, due to quicker exhaustion.

### 7.2 Catching Bags

Catching nets where you can visibly see the bird through is preferred. A Catching net around 40cm in diameter would be the best net to use when capturing the Square - Tailed Kite.

Using catching bags which do not allow you to visibly see the bird in the bag is not recommended for use, considering these raptors are a hazardous species of bird, if you cannot see their movement whilst being restrained in the bag they may cause injuries to you while trying to remove them.

*Figure 14*



*(Figure 14 shows a suitable catching net used for catching Square - Tailed Kites, Photo by Hutchings, J 2011)*



### 7.3 Capture and Restraint Techniques

When the Square Tailed Kite has been caught up in the net, it is ideal to work with it on the ground still contained in the net. With one hand gently but firmly hold the back of the bird, with your other free hand use your thumb and index finger to restrain the neck so the bird cannot turn around and bite you. Once this is achieved you can place the hand that was holding the back of the bird into the bag, ensuring the wings are in a natural position. Slowly slide your hands down the birds back entirely encircling the wings, feet, and tail. Make sure you have enough restraint on the bird so it cannot get out of this position. This restraining position is called the 'Pigeon Grip' (as shown in figure 16). When you are doing head observations, while holding the kite in the 'Pigeon Grip' position, gently grasp your hands around the kites head so it cannot bite you. (as shown in figure 17) (Pers.Comm Mitchell Bentley Featherdale Wildlife Park Keeper)

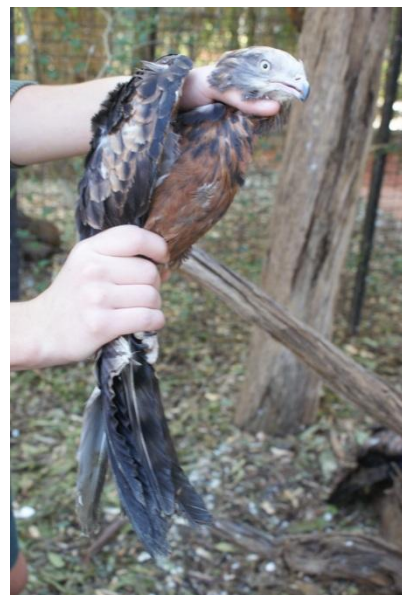
Figure 15



Figure 16



Figure 17



*Figure 15 shows me restraining the S – T kite  
Figure 16 shows the Pigeon Grip restraint technique  
Figure 17 shows the Pigeon Grip restraint, while  
restraining the head for head observations.*

## 7.4 Weighing and Examination

Before you begin the capture of the kite make sure you have all your equipment set up and ready for use. *note: if you lay the bird on its keel it will be less active.* Using a pillow case and a Scale Rod, place the bird into the bag and lift off the ground. The rod should then scale how much the bird weights (remember to weigh the bag before weighing the bird). Once you have an exact weight (Males usually weigh 500 grams, Females 635 grams) you can take it out of the bag and begin examining.

An examination usually needs 2 people, one person to hold the bird and one to examine. Usually an experienced keeper will hold the bird and a Veterinarian will undertake the examination. When physically examining the kites, the birds beak, talons, tarsus, wings, esophagus, keel, eyes and tail are fully assessed. The bird is also checked for mites and lice (full details on examination refer to section 8 Health requirements).

Figure 18



(Figure 18 shows a bag and a Scale rod used to weigh the Kites, Photo by Hutchings, J 2011)

## 7.5 Release

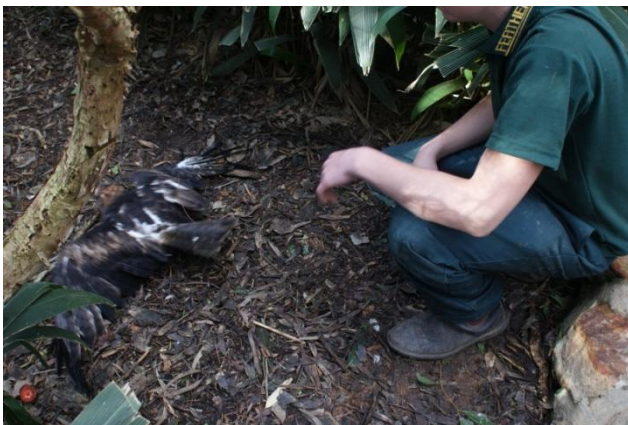
When Releasing Square – Tailed Kites, it is best to release in the morning, this way keepers can do routine checks throughout the day and monitor its progress.

Always release the kite closest to the front of the enclosure, facing the back of the enclosure, keeping in mind to release away from any obstacles in the birds way such as stumps, low perches etc. Releasing down towards the ground is the best way to go about releasing, this is because if the bird has gained any injuries during the capture that keepers are not aware of, facing it to the ground will prevent the kite from doing further damage to itself by trying to fly. Leave the enclosure as soon as the bird has been released to minimize further stress.

When releasing the birds from a Pet Pak simply open the door and allow the bird to leave when it is ready. (*Pers.Comm*)

Once the bird is in the enclosure, stay around for a few minutes to see if the animal settles back in.





The photos above are of me detailing the release of a kite back into its enclosure, it shows you need to lay the kite on its keel and completely let go, moving your arm away instantly.

## 7.6 Transport Requirements

### EAPA Standards for Exhibiting Captive Raptors in New South Wales 1995:

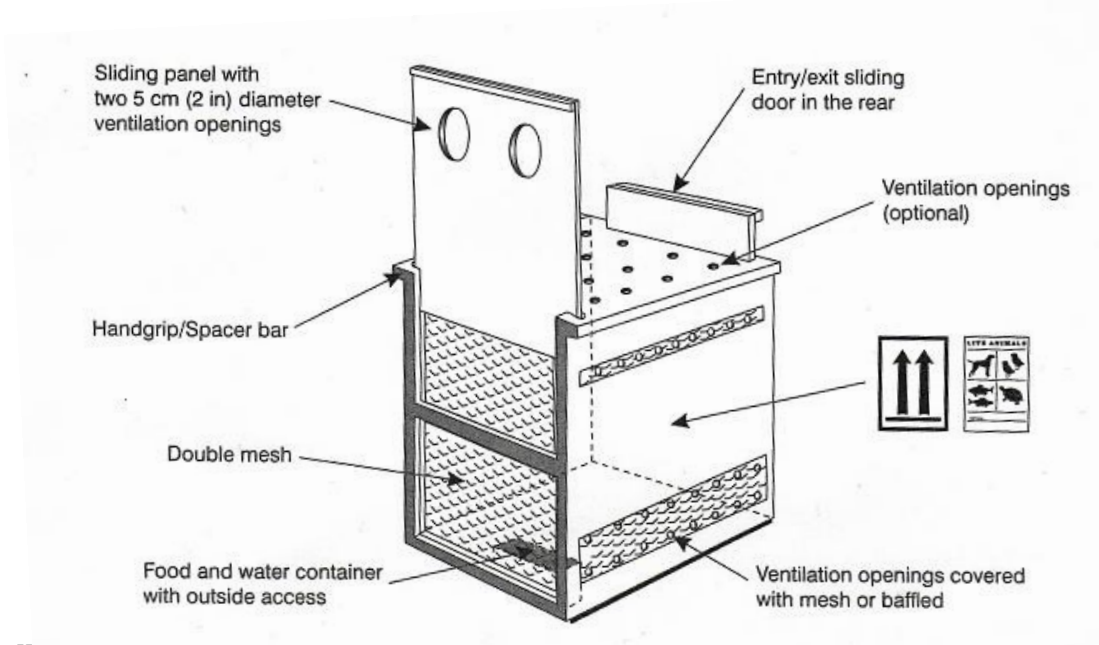
- 1) A transport container for raptors shall not allow the entry of light except through ventilation holes. Ventilation holes shall be pierced around the lower half on all sides of the container, about 10cm above the internal floor height and about 7.5cm apart. Two holes shall be pierced on all four sides 10cm below the internal roof height.
- 2) The dimensions of the transport container shall be at least 30cm longer and wider than the length of the bird from beak tip to tail tip and shall provide at least 15cm head clearance for the bird when standing at rest on the floor of the container or on any perch in the container

#### 7.6.1 Box Design

When transporting the Square – Tailed Kite a long distance the transport box needs to be at least 30cm longer and wider than the length of the bird from beak tip to tail tip. You also need to provide at least 15cm head clearance for the bird when standing at rest on the floor of the box or on any perches in the container. (*Standards for Exhibiting Captive Raptors In New South Wales 1995*) The box can be constructed from either hard solid wood, Non – Toxic Plastic, or Fibre glass. Extensive light should not be able to come through the box, only through the air holes. Ventilation should be on all 4 sides of the box down low approximately 5cm apart. Welded mesh is recommended because it is a strong object that cannot be torn apart. The box needs to be marked with signs advertising ‘Live animals’, ‘Keep Cool’, ‘This Way Up’, and ‘Handle with Care’. The roof of the box must be padded with a non-destructive material to prevent the kite from injuring itself if it jumps. The door of the box can either be hinged or sliding. (*IATA – Live Animal Regulations*)

(Refer to appendix for the IATA standard boxing requirements for transporting, 2010)

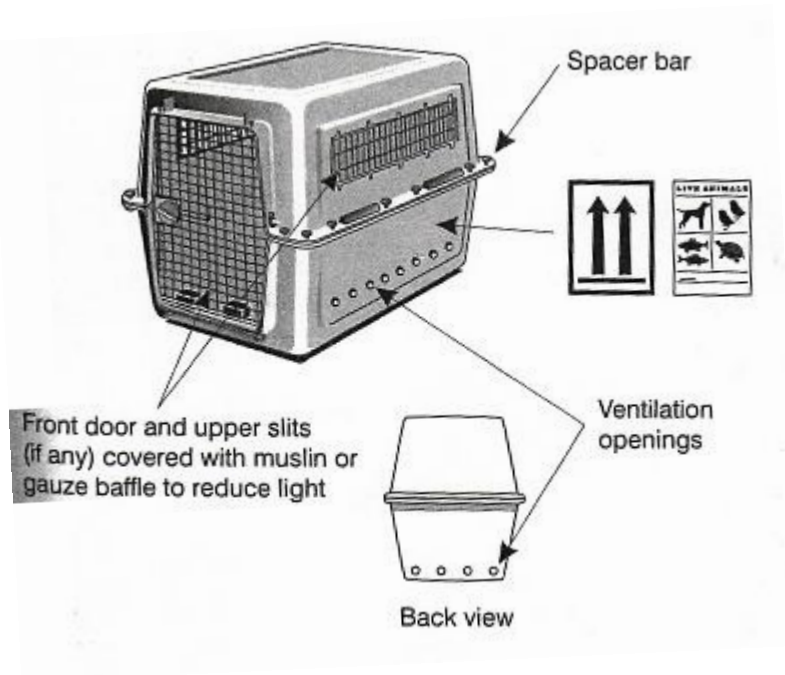
Figure 19



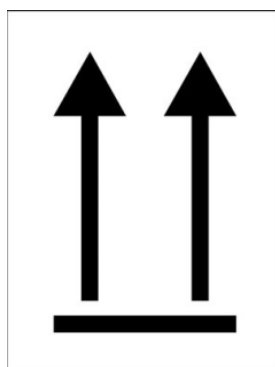


(Figure 19 shows a suitable Long term Transport Box for Kites (IATA – Live Animal Regulations)  
For short term transport, a modified Pet Pak (see figure 20) can be used. A sturdy perch needs to be in place where it cannot roll around, Astro turf or carpet on the floor so the kite has something to grip onto, a Padded roof, and suitable materials on the door and ventilation holes that allows air through but creates a semi darkness scene (like cardboard). Signage stating **‘Live animals’** and **‘This way up’** is still needed to be visible on the outside of the Pet Pak (IATA – Live Animal Regulations)

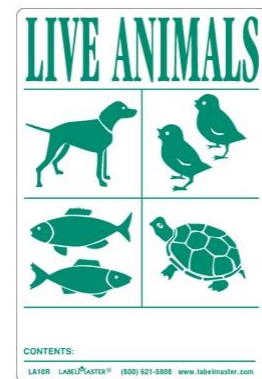
Figure 20



(Figure 20 shows a modified suitable Short Term transport Pet Pak (IATA – Live Animal Regulations))



Signage like these needs to be fixed to the box being Transported with the live animals.



(IATA – Live Animal Regulations)

(IATA – Live Animal Regulations)

### **7.6.2 Furnishings**

Perches or blocks need to be fixed to the ground or walls so they cannot roll around. Astro Turf is recommended to use as a floor covering so the kite has something to grip onto during transport. Don't ever use a looped material that the kite's talons can get stuck through. (*Standards for Exhibiting Captive Raptors In New South Wales 1995*)

### **7.6.3 Water and Food**

If the Kite will be in transport for less than 24 hours, they are not to be fed 4 hours before departure. This is so no regurgitating or choking can occur. Feeding arrangements should be made when the kite has arrived at the destination.

If the Kite is in transport for more than 24 hours, food will need to be supplied; the transport container needs to allow easy access for food and water.

Nestling kites need to be under supervision by a veterinarian during transport. (*Standards for Exhibiting Captive Raptors In New South Wales 1995*)

### **7.6.4 Animals per Box**

Only one Square – Tailed Kite can be transported in a transport box at a time, 2 kites contained in one confined area will cause stress and will both injure themselves. Fledglings can be transported together only if they are from the same clutch & parents. (*Standards for Exhibiting Captive Raptors In New South Wales 1995*)

### **7.6.5 Timing of Transportation**

The best time for transport would be the early morning or late afternoon during the summer months, this way the kite will avoid heat exhaustion. During the winter months, transporting when the day becomes warmer will avoid the kites being transported when temperatures are below 10 °c.

(*Pers.Comm Mitchell Bentley Featherdale Wildlife Park Keeper*)

### **7.6.6 Release from Box**

Leave the box inside the exhibit and allow the bird to leave when it is ready, this will reduce stress, and the kites first time feeding at the new institute will be more successful.

(*Pers.Comm Mitchell Bentley Featherdale Wildlife Park Keeper*)

## 8 Health Requirements

The health of your animal is a major aspect in Zoo Keeping and you need to know if your animal is showing appropriate signs of good health.

### 8.1 Daily Health Checks

Health checks are done on a daily basis, in the morning when keepers clean the enclosure and in afternoons when keepers feed the kites. Always start from the head and work your way down the body.

The things to observe from a distance are:

- Is there any blood in the enclosure or on the bird itself?
- Has it got its eyes closed?
- Is there any discharge coming from the bird's eyes, nose, beak or cloaca?
- Has the bird got its beak open?
- Has the bird got its wings tucked in comfortably?
- Have the birds feet/talons gained any inflammation, check for any injuries.
- Are all Limbs moving freely?

You also need to check the bird for its **Behavioral health.**

- Is the bird stressed?
- Is its showing normal behaviors (*as a keeper you should know the usual behaviour of your birds and be able to determine if it is normal for the bird*)
- Is the bird showing any sign of confusion? Is the bird being enriched enough?
- When entering the enclosure does it show signs of being alert that you have entered?
- How much food is being pulled out of the exhibit in the morning; is it eating enough?  
(*Pers.Comm*)

### 8.2 Detailed Physical Examination

#### 8.2.1 Chemical Restraint

To be done under the supervision of a trained Veterinarian or Curator.

N2O can be administered through a mask that can be placed over the kites heads while being restrained, do not feed the kite a few hours before being chemically restrained.

Make sure to monitor the depth of the anesthetic by the blink reflex and muscle relaxation, do this by touching the corners of the birds eye to see if it blinks.

(*Pers.Comm Chad Staples Featherdale Wildlife Park Senior Curator*).

### 8.2.2 Physical Examination

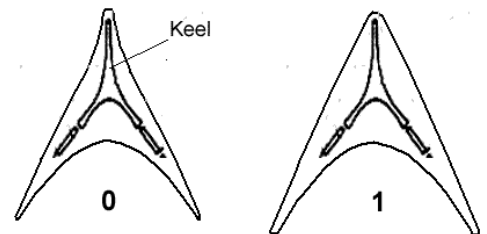
SHOULD ONLY BE DONE IN NON-BREEDING SEASONS!

Physical examinations will rarely need to be taken if appropriate standards of Hygiene are practiced. When physically examining the birds you need to be fast & quiet without stressing the bird out too much (*for correct methods of capture and restrain see section 7 of the Husbandry Manual*). Always weigh the bird, and measure the Tarsus if the bird has not been Leg banded, this way you can find an appropriate sized leg band, then administer an I.D.

#### Head:

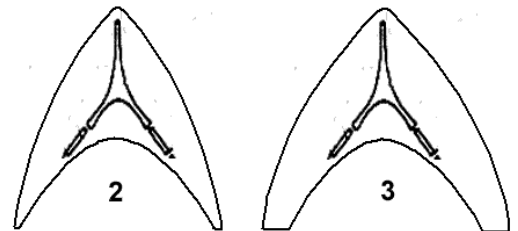
- Check that all the head feathers are groomed properly; there should be no feather loss.
- Open the beak to see if there is any canker, throat worm or abnormalities.
- Beak should be meet evenly on both sides.
- Inspect the eyes for any discharge

Figure 21



#### Breast:

- On the breast of the bird, you will feel the keel (*photo to the right*). Number (2) is a perfect body condition for a kite, (0) is under weight, and (3) is overweight.



#### Wings:

- You need to make sure the wings are tucked in comfortably and are not dropping; this may mean the bird has gained a wing injury and could possibly be broken.
- Check to see if any feathers are broken, or missing, especially the primary and secondary feathers.
- Open the wing out and feel for any abnormalities (breaks, lumps or swelling)

(Figure 21 describes a healthy keel, Bird Australia)

#### Cloaca:

- Check to see if any unusual discharge is coming out of the cloaca.
- Is it swollen?

#### Feet/Talons:

- Check to see if there are any cuts or abrasions around the legs and feet, or unusual looks.
- Check for any Bumble Foot lesions. (See Section 8.4)
- Check to see if the talons are not broken and are still sharp.
- Check legs to see if they are symmetrical.
- Check the Leg band to investigate if it could cause any damage to the bird.

(*Pers.Comm Michael Randy Featherdale Wildlife Park Senior Keeper*).

When you release the bird back into its enclosure, monitor it for at least 2 minutes, you will notice its respiratory rate is high, but it should decrease within 2 minutes.



### 8.3 Routine Treatments

Worming kites is usually done after the breeding season; this is because catching the kites routinely can stress them out of breeding.

Featherdale Wildlife Park uses Vetafarm Wormout Gel® after the breeding season.

The dosage rate for Wormout Gel is .05mLs per 100grams of weight.

There are no other routine treatments Birds of Prey are administered with, although there are some treatments that are used when necessary.

#### Common treatments used when necessary:

- **Psittavet:** used for susceptible bacteria diseases.  
4 grams of powder to 400mLs of clean drinking water (*Remove any other water sources in enclosure when treating the bird*). Treat for 45 days.  
(*Pers.Comm*)
- **Roni Vet:** used for respiratory infections (canker)  
4 grams of powder to 4 liters of clean drinking water (*Remove any other water sources in enclosure when treating the bird*). Treat for 7 days.  
(*AustalianBirdProducts*)
- **Avian Liquid Insecticide:** Treat for Bird Lice (*Oder Phthiraptera, Sub-Order Mallophaga*)  
Dilute 1 Part Concentrate to 1 part Water.  
(*Pers.Comm*)
- **Metacam:** Anti-Inflammatory and Pain Relief. (*Dosage rates prescribed by Veterinarian*)
- **Baytril:** Anti-Bacterial. (*Dosage rates prescribed by Veterinarian*)
- **Amoxicillin:** Anti- Biotic. (*Dosage rates prescribed by Veterinarian*)

## 8.4 Known Health Problems

### **Pododermatitis (Known as Bumblefoot)**

Bumble foot is highly common in all birds of prey.

**Cause:** This infection is caused in 3 different ways.

- If the bird gained abrasions, cuts or punctures to the foot pad from either fighting, over grown talons or cuts from wire, bacteria can then enter under the skins and cause an infection.
- The more common way for the birds to contract Bumblefoot is from im-proper perch size, and spending excessive amount of time perching. Pressure Sores form on the foot pads then bacteria can enter through the sores.
- Vitamin A deficiency.



*Figure 22*

*(Figure 22 shows what Bumblefoot looks like in raptors, Photo by Perth Raptor care)*

### **Signs:**

- You may notice the bird perching on one leg and holding the infected leg up.
- Any blood or abnormalities on the leg, feet and talons.
- Inflammation and lesions found around the talons.

### **Treatment:**

- Clean the infected area with iodine based antiseptic like Betadine.
- Antibiotics can be administered. Drugs like Clavuoxy and Amoxycylav can be given orally to the bird. The Veterinarian will usually make the choice on how serious the case is, how strong the treatment will have to be and the time period of medicating. In extreme cases the bird may have to be euthanized.
- Topical anti-bacterial ointments may also be used to aid the progress.
- Digit amputation.
- Bandage a serious wound to keep clean.

### **Prevention:**

- Ensuring the enclosure has no loose wire or anything that could possibly cut the bird's foot.
- Several Perches with different Shapes, sizes and diameters.
- Appropriate Hygiene
- A good diet.
- Daily observations on talon size and general health.

*(Pers.comm)*

**Trauma** is very common in all Raptors and can lead to other serious illness and injuries such as fractures, stress related infections, and dislocations.

**Cause:**

- The bird stressing out from lawn mowers, storms, maintenance around the enclosure or in the enclosure and being in close proximity to other animals.
- In - experienced keepers handling the raptor wrong and inflicting injuries and stress.

**Signs:**

- High respiratory rate
- Abnormal Posture
- Bleeding
- Feather Loss
- Wing injuries or their position
- Talon injuries
- Beak injuries

**Treatment:**

- Isolation in Quarantine to calm down
- Treatments depending on injury that occurred.
- Veterinarians may have to inspect the animal if seriously injured.

**Prevention:**

- Do not work around or in the enclosure if the bird is stressing and showing stress signals, otherwise catch it up and take it to a suspended cage in Quarantine.
- Have an appropriate number of perches in the enclosure.
- Observe the talon length and monitor if they are over grown.
- Separate any aggressive individuals in the same enclosure.

*(Pers.Comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper).*

**Aspergillosis** Is a secondary fungal infection that is found the in Respiratory system.

**Cause:**

- Stress
- If the bird's immune system is suppressed by an illness, malnutrition or stress, its body allows the fungi from the genus *Aspergillus* to germinate spores.
- Poor ventilation, overcrowding in aviaries, Chemical use, dust, in-appropriate hygiene.
- Damp substrates & nest boxes.
- Mold

**Signs:**

- Decrease in appetite, anorexia.
- Lethargic
- Change or loss in voice call.
- Open mouth breathing, high respiratory rate
- Depression

There are few signs that can make an assumption that a bird has Aspergillosis, the best way to determine if a bird has gained the infection is to undertake a blood test.

**Treatment:**

Depending on how serious the case is, anti-fungal drugs can be used to help fight the infection.

- Itraconazole capsules (which is labeled as Sporanox) is a drug that is used to cure fungal infections. The drug can be administered orally or intravenously. Featherdale Wildlife Park prefers to administer the drug orally.  
5-10mg/kg daily should be given for birds with Aspergillosis.  
(*Pers.Comm Robert Johnson South Penrith Vet Clinic*).
- Amphotericin B is another anti-fungal drug that can be used, this is administered intravenously.

**Prevention:**

- Daily observations for any stress signals. Keep stress down.
- Keep substrate and nest boxes dry, change regularly if needed.
- Have well ventilated enclosures.
- Ensure food is not moldy or fed on a moldy surface.

(*Pers.Comm Michael Randy Featherdale Wildlife Park Senior Keeper*).

## **Parasites**

### **Ectoparasites: external parasites**

#### **Cause:**

- Illness of the bird
- Wild birds transferring them
- Substrates

#### **Signs:**

- Bathing in the sun with wings expanding out
- Illness
- Excessive and frantic grooming
- Feathers ruffled up
- Feather damage
- restlessness

#### **Treatment:**

- Medication given orally (see veterinarian)
- Avian Liquid Insecticide
- Major clean of the exhibit and also spray the whole exhibit with insecticides

#### **Prevention:**

- Control wild birds by preventing access to captive birds
- Regular cleaning program
- Dust bath (tub with sand the birds can bathe in)
- Spraying insecticides around the exhibit routinely

## **Endoparasites: internal parasites**

### **Cause:**

- Offal
- Other birds faeces

### **Signs:**

- Loss in body condition
- Dirty vent
- Worms in fecal matter

### **Treatment:**

- Wormout gel
- Worm the birds orally

### **Prevention:**

- General Hygiene and cleaning
- Don't feed offal
- Proper food prep.

## **8.5 Quarantine Requirements**

For any animal in Quarantine you need to start records from the day it comes into Quarantine until the day it leaves.

Important notable events include:

- The history of the bird - Injuries, normal behaviours for that individual, illness.
- Any food taken in or out
- Behavior
- Worming dates
- Medications (*dosages rates, and how many times per day is it administered*)
- Length and Weight records

For Square – Tailed Kites coming to your institutes from another major zoo, the minimal Quarantine time is only 2 days; During the 2 days this allows the bird to calm down, eat, and have a general examination from keepers. Major zoos have strict Quarantine regulations and do not let an animal leave without passing all tests.

If the Kite is taken off exhibit and brought into Quarantine because of a health problem, Quarantine period may take a minimum of 7 – 10 days. During this time keepers conduct a physical examination (including weighing), treat for worms, and conduct faecal floats to test for endoparasites. If results come back positive for parasites, Veterinarians will inform you and give instructions on further times in quarantine and if any medications needs to be administered.

*(Pers.Comm Rick Webb Featherdale Wildlife Park Manager).*

## 9 Behaviour

The behaviour with any wild animal is different to what it is in captivity. That's why enrichment is important.

### 9.1 Activity

#### Captivity:

- Perch
- Sunbake
- Bathe
- Investigate substrate for any insects
- Relatively quiet, occasional give a yelp.

#### Wild:

- Soar above eucalypt forest in search of chick they can pull from nests
- Perch
- Search for any other small mammals or carrion.
- Bath

### 9.2 Social Behaviour

Square – Tailed kites are a monogamous species (*Cupper & Cupper*), so you can exhibit them in pairs without having the worry about any major risk of them harming one another. In my experience I have noted that once bonded with one another, the 2 kites groom and feed each other on a daily basis. Bonding is a slow process and will have to be done overtime. Putting a kite that is in an enclosure in with another kite that is in the exhibited enclosure will allow them to visually see each other but they cannot hurt each other; if this is done regularly, soon enough the kites can be housed together, but supplying visual barriers for them is needed.

In the wild these kites are solitary in the off seasons, very rarely seen soars in pairs (*Aumann 1991*). Only in the breeding seasons will the 2 kites soar and perch together (*Debus & Czechura 1989*).

### 9.3 Reproductive Behaviour

In the wild the S-T Kites will advertise numerous sexual behaviours; a series of aerial undulations, swooping with half-closed wings and rising again while calling loudly, assumed to be the male birds (*Aust. Atlas*). During the courtship flight (consisting of the male and female) the pair will soar leisurely with slow wing beats on a zigzag course with the male pursuing. When soaring close by each other, the male will present his talons (*Debus 1981; Johnston 1983*). It has been recorded that they can soar at a level of tree-tops to 30m (*Debus & Czechura 1989*).

Of course in captivity it's almost impossible for the 2 kites to reenact their natural reproductive behaviours, however there still are reproductive behaviours such as grooming each other, allo-preening (usually taking place on the nest, with the male preening the females face and nape, and rubbing bills together in an affectionate way), mutual sun bathing (one bird on a perch, and one on the ground with their feather ruffled up), courtship feeding, then finally copulation. (*Pers.Comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper*).



*Figure 23*



*(Figure 23 shows 2 square tailed kites grooming each other (male left, female right)  
Photo by Hutchings, J 2011)*

## **9.4 Bathing**

Square – Tailed Kites rarely bathe in their water bowl. On sunny days they will lay on the ground with their wings spread out with their head on the ground. They do this to remove any ectoparasites they might have; this is a behaviour that is counted as bathing.

All enclosures at FWP have a sprinkler system over the top of the exhibits. On hot days the sprinklers are turned on so the birds can cool down and bathe whilst perching. *(Pers.Comm)*

Bathing does not always refer to the act of bathing in water, bathing can also refer to grooming and preening. On a daily basis birds will either groom themselves or each other. A bird grooming themselves shows positive signs of health, this is because they are replenishing their feathers with new oils and picking out ectoparasites. *(Pers.Comm)*

*Figure 24*



*(Figure 24 shows a female S-T kite grooming herself.  
Photo by Hutchings, J 2011)*

## 9.5 Behavioural Problems

Aggression towards keepers would be the main behavioral problem that is un-wanted, considering no institution wants their keepers being attacked. Depending on the time of year the kite is swooping, it may be a good sign. If the kites are swooping you in August – September this is their breeding season, so they may just be protecting their territory and/or partner getting ready to breed. If your kite is swooping you in the off seasons, than you may either have to split the pair up so no further injuries are inflicted to the other bird or the keeper.

*(Pers.Comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper).*

The 2 kites waiting at the enclosure door can be an undesirable behaviour. They could do this due to a few possibilities, they are used to the daily feeding schedule and could be waiting for their food, wanting attention (for human imprinted birds) or a sign of boredom. *(Pers.Comm)*

*Figure 25*



*(Figure 25 shows 2 S-T kites showing undesirable behaviour waiting at the enclosure door.*

*Photo by Hutchings J, 2011)*

## 9.6 Signs of Stress

**Stress can be caused by numerous things in captivity, such as:**

- Over heating
- Cats and Foxes
- Capture and Restraint'
- Injuries
- Loud Noises
- Housed with another aggressive individual
- Public antagonizing the bird from the outside
- Illness
- Working in or around the exhibit

*(Pers.Comm)*

**Signs of Stress to watch for:**

- Weight loss
  - Food not eaten
  - Open mouth breathing
  - Spending excessive amounts of time on the ground
  - Spending time in the far back corner of the exhibit
  - Ruffled feathers
  - Lameness
  - Flighty
  - Over excited
  - Squinted eyes
  - Feather Picking/self-mutilation
  - Abnormal Vocalization
  - Lack of desire to socialize
  - Increased Pecking
- (Pers.Comm)*

**9.7 Behavioural Enrichment**

- Move feed stump around the exhibit
  - Scatter food around exhibit floor
  - Put day old chickens in a basket, or a small passerines nest and tie around the highest perch in the exhibit (considering S-T kites rob other birds nest for their hatchlings)
  - Obtain large live invertebrates and release onto the exhibit floor allowing the kites to forage for their food.
  - Feed the kite's a large carcass as opposed to small portions. I.e. half a rabbit or chicken, this allows the kites to ingest fur and guts that are good for them.
  - Frequently change the exhibit layout
  - Sprinkler systems being turned on for the kites to bathe
  - Sensory stimulation- paint blood around exhibit
  - Put a towel in with a dingo or a cat for a week then in the Kite exhibit for 1 day
- (Pers.Comm)*

*(See appendix for an Enrichment calendar + Enrichment abbreviations for Kites that is used at Taronga Zoo Sydney)*

## **9.8 Introductions and Removals**

When introducing a new bird into an enclosure that already houses another, doing it slowly is the main key, you don't want to put a new bird into an enclosure that has a territory established by another bird. The way FWP introduces a new bird is using a holding cage and the main enclosure. The new bird will stay in a small holding cage that allows the bird to open its wings and easily turn around; this cage will be placed in the exhibited enclosure allowing the other bird to see it but can't harm it. This happens for approx. 2 – 4 days then the new bird is released into the enclosure in the morning and monitored by keepers throughout the day. (*Pers.Comm*)

When removing birds from an exhibit, 2 experienced keepers are needed along with 2 good nets and Pet packs with straw as a substrate. Catching should only be done in the morning, because the temperature is at its lowest and if anything goes wrong with the capture, keepers have the rest of the day to keep an eye out for any stress signals. (*For capture and restrain techniques refer to sections 7*) (*Pers.Comm*)

## **9.9 Intraspecific Compatibility**

Square – Tailed Kites are best housed in pairs with the same species. They bond very well with each other as they are monogamous (*Cupper & Cupper*).

## **9.10 Interspecific Compatibility**

Square – Tailed Kites do not get along with many other birds of prey, so they are best housed together with their own species. Considering these kites rob other birds' nests and eat their chicks, any other birds that are housed with that breed will not reproduce many chicks once the S-T kites have been introduced into the enclosure or survive.

## **9.11 Suitability to Captivity**

In the wild the Square – Tailed Kites are approachable from a short distance (*Debus & Czechura 1989*). In my experience, I have found captive S-T Kites make good exhibiting animals as they like to vocalize to each other, and are placid towards their keepers in the off seasons. When they are hand raised they are extremely friendly and would make good birds for a free-flight bird show.

## **10 Breeding**

### **10.1 Mating System**

Square-tailed Kites are Monogamous, meaning they mate with the same partner for life. If they are only new to breeding and they lose their partner, they can potentially find a new breeding partner. (*S.J.S Dubus*).

### **10.2 Ease of Breeding**

Featherdale Wildlife Park hasn't bred their Square-tailed Kites before as they both have wing injuries and therefore would not be fit parents. They can't show natural breeding behaviours like courtship due to the fact that they cannot fly.

Considering these Kites aren't very common in captivity, the success of breeding will determine if the pair is well bonded and genetically viable. Enclosures need to be at an adequate size for courtship and sufficient visual barriers added. Some triggers for breeding this species of Kites include nesting platforms made from eucalypt browse, mix up of their diet, correct weather conditions, and sufficient number of perches. (*Pers.Comm*)

### **10.3 Reproductive Condition**

#### **10.3.1 Females**

Female Kites will need their food intake increased and supplements added. Petvite and Calcium Power are especially needed for the female as she draws calcium straight from her bones to coat her eggs when developing. Food will need to be increased and also mixed up as the female will start to fight the male for food if there is an in-adequate amount. (*Pers.Comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper*).

#### **10.3.2 Males**

Once the breeding season has ended, males need to be leaned off and not fed large amounts. On the lead up to the breeding seasons males will then need to be fed more food. The change in diet tells the male what season it is and brings the male into breeding condition.

Once the breeding season has finished the males testicles shrink in order to loose un-necessary weight to make flight and hunting easier. (*Pers.Comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper*).

## **10.4 Techniques Used to Control Breeding**

There are a few techniques that can be used to control the captive breeding of these kites

### **Removal of Nesting Platforms:**

Removing the nesting platforms will not allow the female to incubate an egg if she wishes to lay. Even if a nesting platform is removed, the female can still lay an egg if she is in breeding mode, she will either lay it directly on the ground or abandon it as they will never nest on the ground, or she will lay it while perching and in most cases the egg will smash once hitting the ground.

*(Pers.Comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper).*

### **Single Sex Exhibit:**

In the breeding seasons the kites can be split up, with one being on exhibit and the other being off exhibit.

*(Pers.Comm)*

### **Food Intake:**

Food intake is one of the main triggers in breeding. If you do not increase the food in the breeding season the kites will realize there is not enough food to feed themselves as well as chicks and won't reproduce that season.

*(Pers.Comm)*

### **Disposition:**

You can send one of the Kites to another park or zoo in return for another animal that may be an asset to your collection.

*(Pers.Comm)*

### **Euthanasia:**

If there is no other way that breeding can be controlled in your institution to manage your collection than humane collection management euthanasia would be the absolute last option. This will only happen if there are excessive numbers of this species and no other institute wants them. I personally have not known for this to happen with this species or any other raptors.

*(Pers.Comm)*

## **10.5 Occurrence of Hybrids**

There are no Hybrids in Square – Tailed Kites as there is no other raptor that is closely related to them in Australia.

*(Pers.Comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper).*

## **10.6 Timing of Breeding**

Below displays each states season of egg laying for the Square – Tailed Kites in captivity.

**QLD:** between July and October (*Cameron 1976*)

**NSW:** between late August to Early November (*Johnston 1983; Schulz 1983*)

**VIC:** between September to November (*Hollands*)

**WA:** between September to December (*Ferguson & Bonnin 1987*)

**NT:** not applicable

Overall the average breeding season for Square Tailed Kites is August to November annually.

In tropical regions throughout Australia nest building has been recorded in late September.

In dry parts of Australia, nest have been recorded that have been ready for eggs in early April.

(*Cupper & Cupper*)

## **10.7 Age at First Breeding and Last Breeding**

Ability to breed is after plumage, which is at the end of the 2<sup>nd</sup> or 3<sup>rd</sup> year.

Captive raptors have been recorded to successfully breed up until the age of 13. Reports show that raptors in their late years can still lay eggs and show breeding behaviours but have infertile eggs.

(*D.J.James*)

## **10.8 Ability to Breed Every Year**

Square – Tailed Kites have the ability to breed every year in captivity if they are given the opportunity. They can also breed each year in the wild, although they will not breed if there is a low source of food or harsh droughts.

(*Pers.Comm*)

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

If the first Clutch of eggs laid are pulled and artificially incubated, the kites will be able to lay another healthy clutch of eggs which can be parentally raised or artificially raised depending on what the institution requires.

(*Pers.Comm*)



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

Square – Tailed Kites nest on a Platform of sticks and leaves. Wild S-T kites build nest being 50 – 85cm across and 25 – 60cm thick externally; internally being 20 – 35cm across and 6 -8cm deep. (*Barnard 1934*)

Using eucalypt branches keepers can construct a man-made nest that the kites can nest in. The nest should be under the sheltered area at the back of the enclosure away from the public so the kites can have privacy. (*Pers.Comm*)

At Featherdale keepers built eucalypt nesting platforms for each pair of raptors and re build them annually before the breeding season (*you can use old nests as an enrichment item for carnivorous mammals*).

There has been success in all our breeding raptors with a nest being 70cm in diameter, for the base of the nest you can use a Palm Frond then start building the nest with eucalypt branches, for the stability of the nest use wire on the front back and both sides to tie it down, you can also line the nest with eucalypt leaves for extra cushioning once done.

You should also add items to the exhibit floor so the birds can add to the nest if they wish. (*Pers.comm*)

*Figure 26*



*Figure 27*



*(Figure 26 shows the start of building a man-made nest using a palm frond as the base  
Figure 27 shows a newly finished man-made nest from Ariel view  
Photos by Hutchings, J 2011)*

*Figure 28*



*Figure 29*



*(Figure 28 shows a newly finished man-made nest  
Figure 29 shows the same nest 6 weeks later that has been used by the S-T kite as there are faeces  
on the leaves.  
Photos by Hutchings, J 2011)*

### 10.11 Breeding Diet

During the breeding season the S-T kites should be offered a mixture of rabbit, mice, kangaroo, emu, adult chicken, mince, diced beef and any large game prey items cut into small portions, **YOU SHOULD NEVER FEED DAY OLD CHICKENS WHEN THEY ARE RAISING CHICKS!** They get confused and try to feed their chick to the food item, they can also think that their chick is a food item and consume it themselves. (*Pers.comm*)

All food fed out should have approximately 5 grams of Petvite and Calcium Powder sprinkled on the meat. In the breeding season there should be no starve days or half days for raptors on eggs or raising chicks. (*Pers.comm*)

Table 3

<b>1 DAY OLD CHICKEN WEIGHS 43 GRAMS. FEED TO EQUIVILATE WEIGHT. TABLE BASED ON 1 PAIR OF SQUARE – TAILED KITES</b>				
<b>Non Breeding Season</b>	<b>Start of breeding Season</b>	<b>First 3 weeks of Incubation</b>	<b>Last 2 weeks of incubation</b>	<b>Once chicks have hatched</b>
258 grams daily	301 grams daily	344 grams daily	430 grams daily	516 grams daily
Mixture of D.O.C, rabbit, kangaroo, Emu, adult chicken, mice, large game meat (cut small), Mince, and Diced Beef.	Mixture of D.O.C, rabbit, kangaroo, Emu, adult chicken, mice, large game meat (cut small), Mince, and Diced Beef.	Mixture of D.O.C, rabbit, kangaroo, Emu, adult chicken, mice, large game meat (cut small), Mince, and Diced Beef.	Mixture of rabbit, kangaroo, Emu, adult chicken, mice, large game meat (cut small), Mince, and Diced Beef. <b>DO NOT FEED DAY OLD CHICKENS</b>	Mixture of rabbit, kangaroo, Emu, adult chicken, mice, large game meat (cut small), Mince, and Diced Beef. <b>DO NOT FEED DAY OLD CHICKENS</b>

(Table 3 shows the feeding regime for a breeding pair of S-T kites)

### 10.12 Incubation Period

The incubation period has been noted to be between 37 – 42 days, the male and female both take it in turn to incubate, however most of the time the female is sitting incubating with the male perching close by. (*Cupper & Cupper*)

### 10.13 Clutch Size

The average clutch size is between 1 and 3 eggs, with the 3<sup>rd</sup> egg sometimes being infertile. (*Barnard 1934*). The eggs are rounded, being course-grained, dull not glossy, colouring is white with blotches of reddish-brown or purplish-red (*Barnard 1934*). The eggs are 54mm tall and 40mm wide (*Cameron 1976*).

### **10.14 Age at Fledging**

Fledging has had numerous records with the most common usually fledging at 9 weeks of age (*Jolly 1989*). Some S-T kites have fledged at the age of 59 days (*Cupper & Cupper*), and some chicks still stay in the nest well after they can fly (*Ferguson & Bonnin 1987*).

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

Depending on the Institutions needs the egg can be removed for artificial incubation. The chick can be removed for artificial hand raising, or the chick can be removed once it has fledged.

If the institution decide for the chick to be parentally raised, it is best to remove the chick just after it has fledged at an age of approx. 10 weeks just to avoid any risks.

(*Pers.Comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper*).

### **10.16 Growth and Development**

- Semi - Altricial chick covered in white down but still dependent on mother. This chick is 1 week old.

*Figure 30*



(Figure 30 shows a semi altricial chick  
Photo by Michael Morcombe)

- 9 week old Square – Tailed Kites that are ready to fledge; they have small amounts of white down on them, with everything that a Juvenile has.

*Figure 31*



(Figure 31 shows S-T kite fledglings  
Photo by <http://birdsinyard.net>)



- Juvenile Square – Tailed Kite looks like an adult but smaller in size with a smaller tail, more golden than brown, with fine dark streaking on head and breast, and has dark coloured eyes not yellow. Sometimes mistaken for a fledgling but doesn't have any down.

*Figure 32*



*(Figure 32 shows a Juvenile S-T kite  
Photo by Andrew Skeoch)*

- Adult Square – Tailed Kite; clearly has the long tail with white underneath, white face, yellow eyes, with a black streaked head.

*Figure 33*



*(Figure 33 shows an Adult Square Tailed Kite  
Photo by Society for the Preservation of Raptors (INC.))*

## 11 . Artificial Rearing

Artificial rearing can be done for Square – Tailed Kites if you want to double clutch, if you don't think the parents are capable of rearing chicks or if you want a hand reared bird.

For optimal results in hatching the chick in an incubator, leaving the egg in the nest for natural incubation by the parents for at least 7 – 10 days will give you more success.

*(Pers.comm Cherie Neasbey Featherdale Wildlife Park Senior Keeper)*

### 11.1 Incubator Type

Any incubator that can incubate bird eggs, turn or roll them automatically and be able to adjust the right Temperature and Humidity is best for this job.

One of the incubators Featherdale Wildlife Park uses is the R Com 50 Pro Digital Incubator. It has an LCD screen displaying the necessary information keepers need to know such as, humidity levels, Temperature, turning angle and intervals, and day of incubation. The base of the incubator has rods that the eggs sit in between and while the rods spin the egg will rotate. The amount of rotation can be altered.

*Figure 34*



*Figure 35*



*(Figure 34 shows the R Com 50 Pro Digital Incubator*

*Figure 35 shows the LCD screen on the R Com 50 Pro Digital Incubator*

*Photos by Hutchings, J 2012)*

### 11.2 Incubation Temperatures and Humidity

When Incubating S-T kites eggs the temperature needs to be between 37.2°C and 37.5°C with the Humidity levels being at 45% *(Pers.comm Chad Staples Featherdale Wildlife Park Curator)*

### 11.3 Desired % Egg Mass Loss

10% *(Pers.comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper)*

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

Featherdale Wildlife Park takes the eggs out of the incubator a couple of days before the eggs start to hatch and put them into a 'Hatcher'. The temperature is dropped by a couple of degrees, around 35°C – 36°C, and the humidity is raised 20% making the humidity 60% - 65%. The humidity is raised so the membrane of the egg does not dry out making it harder for the chick to hatch.

FWP use an incubator and hatcher separately so when the chicks hatch the matter inside the hatched eggs does not affect the other eggs still incubating.

*(Pers.comm Chad Staples Featherdale Wildlife Park Curator)*

*Figure 36*



*(Figure 36 shows the 'Hatcher' at FWP  
Photo by Hutchings, J 2012)*

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

When the bird pips internally, it will take approximately 2 days to hatch completely. It is good to allow 1 day for the external pip then another day to fully hatch out.

*(Pers.comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper)*

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

A brooder that has moving air, does not rotate, and a digital thermal control is preferred.

*(Pers.comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper)*

Timber brooder of 500mm x 500mm x 500mm, with the front being see through, a 40w reflector light on one side, a bucket with a thin layer of either wood shaving or Breeders choice kitty litter for the chicks to live in will be an adequate set up.

The Brinsea TLC-4 is a brooder used in most aviculture centers as well as parks and zoos. They have a clear front so the birds can see the humans and the humans can see the birds (*benefits if the bird is going to have human attention in its stages of adult hood*). The brooder allows a clean environment for the bird to grow up in as no air from the outside can get in, preventing any bacteria entering the brooder. This particular brand has what is called an OMNITHERM™ heating systems which is an advanced incubating heating system, this is warm air that is fan forced throughout the incubator resulting in accurate temperatures.

The Brinsea TLC-4 can also be used as a hospital for any sick or injured birds and even small mammals.



Figure 37



(Figure 37 shows a brooder at FWP with 2 Masked Owl Chicks (*Tyto novaehollandiae*)

Photo by Hutchings, J 2012

Figure 38 shows a Brinsea Brooder TLC-4

Photo by Brinsea)

Figure 38



## 11.7 Brooder Temperatures

The temperature requirements will change depending on the development stage and the age of the chick/s:

NOTE: if you have more than 1 chick, you will be able to see if they are too hot as they will be separated from each other, if they are cool they will huddle up and obtain each other's warmth. It is better to raise chicks together in the one brooder as they will keep each other warm and will be able to show you if the temperature is too hot or not.

- For the first 2 days the brooder should be the same temperatures as the hatcher; 35°C to 36°C
- For the next 2 weeks the temperature should drop from 33°C to 27°C, each day dropping the temperature slowly.
- For the 3<sup>rd</sup> week the temperature should be dropped to 25°C, by this time the chick should have pin feathers and will be able to maintain its temperature.
- Once the chick has down on its back, chest and wings it is time to take it out of the brooder and place it in a carry box with a t-shirt covering half of the box.
- Once the kite is starting to jump out of the box it can be then placed in a flight aviary
- Once you notice the kite is perching from one perch to another, the box can then be removed.

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

In the first 12 hours of hatching the chick does not need to be fed, this is because it will be absorbing all the nutrients from there egg like the yolk, this will satisfy them for the first day, sometimes longer.

Once the chick has fully dried out and is alert the first feed can then be fed. For the first week pinkie mice cut into relatively small pieces, usually 5ths or 6ths should only be fed. Pinkie mice are a good starting diet for all raptors as they do not consist of any harsh bone or fur that can become congested in birds crop. Using a clean and fairly small set of forceps the chick can be fed, you want to feed a newly hatched chick 5 – 6 times a day. After 1 week being fed pinkie mice, you can then start to introduce other items such as Day old Chickens, Diced Beef, Rabbit and Kangaroo. (*Pers.comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper*)

In my experience I have found that day old chickens would be the best as it has bones, feathers, and gut content that is all important for the growth and development of a chick.

### **11.9 Specific Requirements**

Multivitamin liquid can be added to the feed, this is so the bird is receiving the essentials it needs to grow and develop.

ONE drop of Pentavite multivitamin liquid can be added to ONE piece of food at the beginning of ONE feed per day and fed immediately. I cannot stress enough to only put one drop of the liquid on one piece of meat once a day, if you supply too much of this vitamin it will do worse for the bird than better. (*pers.comm*)

### **11.10 Pinioning Requirements**

Pinioning is not recommended to do for Square – Tailed Kites, let alone any raptor, as it is an extremely poor and pointless choice. (*pers.comm*)

### 11.11 Data Recording

When hand rearing any animals records are extremely important to keep. Records will help you answer questions if you need to look back on the rearing process. If any problems go wrong, your records may be able to pin point what the problem was.

Record sheets for birds usually include Date, Feeds per day, Food type, Quantity, Temperature, Feather coverage, Substrate Change, and Weight.

You can also measure the bird's tarsus and beak and record the growth that way.  
(Refer to appendix for a Bird Hand Rearing chart)

Figure 38

Date	Feeds per Day	Food Type	Quantity	Temperature	Feather Coverage	Substrate Changed	Weight
2/7/11	every 4 hrs	Adult Mouse	4.5gms	30°C	None	Bedding only	15gms
2/8/11	every 4 hrs	"	10gm	30°C	"	"	"
2/9/11	every 4 hrs	"	10gm	30°C	"	"	"
2/10/11	every 4 hrs	"	10gm	30°C	"	"	"
2/11/11	every 4 hrs	"	10gm	30°C	"	"	"
2/12/11	every 4 hrs	"	10gm	30°C	"	"	"
2/13/11	every 4 hrs	"	10gm	30°C	"	"	"
2/14/11	every 4 hrs	"	10gm	30°C	"	"	"
2/15/11	every 4 hrs	"	10gm	30°C	"	"	"
2/16/11	every 4 hrs	"	10gm	30°C	"	"	"
2/17/11	every 4 hrs	"	10gm	30°C	"	"	"
2/18/11	every 4 hrs	"	10gm	30°C	"	"	"
2/19/11	every 4 hrs	"	10gm	30°C	"	"	"
2/20/11	every 4 hrs	"	10gm	30°C	"	"	"
2/21/11	every 4 hrs	"	10gm	30°C	"	"	"
2/22/11	every 4 hrs	"	10gm	30°C	"	"	"
2/23/11	every 4 hrs	"	10gm	30°C	"	"	"
2/24/11	every 4 hrs	"	10gm	30°C	"	"	"
2/25/11	every 4 hrs	"	10gm	30°C	"	"	"
2/26/11	every 4 hrs	"	10gm	30°C	"	"	"
2/27/11	every 4 hrs	"	10gm	30°C	"	"	"
2/28/11	every 4 hrs	"	10gm	30°C	"	"	"
2/29/11	every 4 hrs	"	10gm	30°C	"	"	"
2/30/11	every 4 hrs	"	10gm	30°C	"	"	"
3/1/11	every 4 hrs	"	10gm	30°C	"	"	"
3/2/11	every 4 hrs	"	10gm	30°C	"	"	"
3/3/11	every 4 hrs	"	10gm	30°C	"	"	"
3/4/11	every 4 hrs	"	10gm	30°C	"	"	"
3/5/11	every 4 hrs	"	10gm	30°C	"	"	"
3/6/11	every 4 hrs	"	10gm	30°C	"	"	"
3/7/11	every 4 hrs	"	10gm	30°C	"	"	"
3/8/11	every 4 hrs	"	10gm	30°C	"	"	"
3/9/11	every 4 hrs	"	10gm	30°C	"	"	"
3/10/11	every 4 hrs	"	10gm	30°C	"	"	"
3/11/11	every 4 hrs	"	10gm	30°C	"	"	"
3/12/11	every 4 hrs	"	10gm	30°C	"	"	"
3/13/11	every 4 hrs	"	10gm	30°C	"	"	"
3/14/11	every 4 hrs	"	10gm	30°C	"	"	"
3/15/11	every 4 hrs	"	10gm	30°C	"	"	"
3/16/11	every 4 hrs	"	10gm	30°C	"	"	"
3/17/11	every 4 hrs	"	10gm	30°C	"	"	"
3/18/11	every 4 hrs	"	10gm	30°C	"	"	"
3/19/11	every 4 hrs	"	10gm	30°C	"	"	"
3/20/11	every 4 hrs	"	10gm	30°C	"	"	"
3/21/11	every 4 hrs	"	10gm	30°C	"	"	"
3/22/11	every 4 hrs	"	10gm	30°C	"	"	"
3/23/11	every 4 hrs	"	10gm	30°C	"	"	"
3/24/11	every 4 hrs	"	10gm	30°C	"	"	"
3/25/11	every 4 hrs	"	10gm	30°C	"	"	"
3/26/11	every 4 hrs	"	10gm	30°C	"	"	"
3/27/11	every 4 hrs	"	10gm	30°C	"	"	"
3/28/11	every 4 hrs	"	10gm	30°C	"	"	"
3/29/11	every 4 hrs	"	10gm	30°C	"	"	"
3/30/11	every 4 hrs	"	10gm	30°C	"	"	"
3/31/11	every 4 hrs	"	10gm	30°C	"	"	"

(Figure 38 shows a record sheet for a Masked Owl (*Tyto novaehollandiae*) I hand reared in 2012  
Photo by Hutchings J, 2012)

### 11.12 Identification Methods

Nail polish can be painted on the kite's talon when first hatched to identify them. After 3 weeks of age leg bands can then be put on their legs. After the kites are at the age of fully fledging a microchip can then be implanted (refer to section 5.2 for more information on identification)

### 11.13 Hygiene

Hygiene is important when hand rearing any animals especially in the early stages of development. All equipment such as forceps, scissor, and jugs should be kept clean and sterol in between each feed. Milton is a reliable brand and easy to use, simply dissolve the tablets in water and keep in a sealed container and wash the equipment with it.

You can also use a microwave sterilizer kit that will sterilize the equipment after each feed killing all bacteria. Once it all has been sterilized and clean, make sure you dry the equipment and store away in a sealed container. (pers.comm)

### **11.14 Behavioural Considerations**

**Syblicide** is a consideration you need to take into account when hand rearing chicks. Syblicide is when 1 chick, usually the bigger stronger one, kills and eats the other chick/s, usually being the smaller weaker ones. (*Pers.comm Mitchell Bentley Featherdale Wildlife Park Senior Keeper*)

If you are hand rearing in hope for the kite to be released, then you need to keep in mind of **Human imprinting** on the bird. It will see humans as parents and be imprinted on you and lose its fear of humans. To avoid this use a puppet when feeding. Human interaction should only be given when physically examining. If the bird is kept in captivity human imprinting can also be an issue as it loses its fear of humans and can potentially harm keepers when they are dealing with the bird. (*pers.comm*)

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

Fostering an egg or a chick to another raptor can be done, but, can only be done if the other raptor is also sitting on eggs or raising a chick otherwise if a chick was placed in with another raptor out of nowhere they would see it as a food source and feast on it and for an egg it would be left unincubated and die.

Other kites would be best used as foster parents such as the Black Kite (*Milvus migrans*) and Whistling Kite (*Haliastur sphenurus*).

### **11.16 Weaning**

In my experience in artificially rearing raptors I have found the following information to be useful keep in mind that every individual is different and this is just a guide:

Weaning can start at the age of 2 – 3 weeks, this is when the chick is removed from the brooder as it will be able to thermo regulate with the feathers it has grown and its eyes has opened.

The chick will be used to looking up when getting fed considering when we feed them with the forceps we are feeding from the top. Simply put all the food desired for the chick to eat in a bowl and place in front of the chick, allow the food to touch its beak and this will allow the chick to grab the food and pull it back and feast on it. If it does not begin to do that you can place the bowl on the base of the box and with the forceps grab small amounts of food at one time and allow the chick to see where the food is coming from before offering it. Over time the chick will start to eat from the bowl as it can see where the food is coming from.

At each feed put all the food in the bowl and give time for the chick to feed itself.

## **11.17 Rehabilitation Procedures**

Before taking up the duties of rehabilitating a raptor, you need to make sure you have the right skills and facilities, as well as look into the release options as it will greatly impact on the Rehab procedures. You need to think are you releasing back into the wild or will it spend the rest of its life in captivity?

If you are releasing back into the wild than very little human interaction is preferred, you don't want a wild kite being imprinted on you when you're intending for a release, young birds tend to imprint on the first day of care, but to avoid this, simply use a puppet or a barrier when feeding.

Sick and Injured kites will need an area of warmth and low stress, an area with a constant temperature of 28°C – 30°C with darkness is preferred. This can be established in a suspended cage with a heat light, hot box, cardboard box with heat light or a brooder, making sure the kite is hidden with blankets or browse. (*Caring for Australian native birds, Parsons, H 1999*)

Prior to release, the kite needs to be housed into a release cage where it can fly and gain strength (a round aviary that is high is preferred as the kite can fly in circles and gain muscle). Feeding needs to also be monitored to make sure it is feeding appropriately. When feeding dead food you need to make the kite work for it or forage for it, but if the kite will not eat animals that are already dead, then feeding live food will need to be done. A lot of people do not approve of this, but feeding live food is the last resort and will greatly impact on the hunting skills in the wild for the bird.

(*Caring for Australian native birds, Parsons, H 1999*)

When it comes to the day of release into the wild there are certain considerations you need to take into account:

- If the kite was injured from a particular object, is that object in the area of release?
- Can the kite feed itself and catch prey?
- Can it cope with the temperatures where you're releasing it?
- Can the kite fly well enough to survive?
- Is it alert of any predators and humans?
- Does the kite fight back from human handling?
- Is the kite at optimal body weight and condition?
- Are all the feathers in perfect condition?
- Has it preened recently and does water run off the feathers? (check by spraying feathers with water via spray bottle)
- Does the kite naturally distribute to the area?

(*Pers.comm Ravi Wasan Feathered Friends*)

If the bird you are releasing is an adult and was previously wild, it will know how to survive in the wild and a "Hard Release" would be ideal for the bird. A Hard release is when you release the bird into a suitable spot and no monitoring is needed.

If the bird was either an orphaned chick or a juvenile that was still learning survival techniques in the wild, then a "Soft release" would be ideal for this situation. This is when you slowly introduce the bird into the wild, you do this by putting an enclosure in the spot of release so the kite can get used to its surroundings, and get familiar with what animals are around. Once you feel the kite is ready for release, open the door and let the bird leave on its own (release early morning with a full stomach of food as Square tailed kites are diurnal). Support feeding is advised to do; this is when you supply food to the aviary so if the kite does come back it can get food.

(*Pers.comm Cherie Neasbey Featherdale Wildlife Park Senior Keeper*)

## 12 Acknowledgements

I would like to thank the following keepers from Featherdale Wildlife Park for all their help and knowledge that assisted me with complying this Husbandry Manual. Without their help I wouldn't have been able to take the photos that I did and include the information that I did.

- Mitchell Bentley- A big Thank you for the time you took explaining things to me and referring me to other resources, also your Husbandry Manual on the Black Breasted Buzzard (*Hamirostra melanosternon*) was a major asset to my manual, Thank you again!
- Cherie Neasbey – Your Husbandry manual on the Masked Owl (*Tyto novaehollandiae*) filled my manual with different references and ideas. Thank you
- James Fong – Your Husbandry Manual on the Whistling kite (*Haliastur sphenurus*) was a great help and gave me excellent ideas for my manual! Thank you
- Rhys M<sup>c</sup>Donald
- Jake Webb
- Michael Randy
- Rick Webb
- Evan Harris
- Chad Staples
- Jason Hawton

I would like to thank the following Keeper from Taronga Zoo Sydney who took the time and effort to assist me with any questions I had to ask them.

- Brendan Host

I would like to thank my TAFE lectures that supplied me with the resources and help for this Husbandry Manual.

- Graeme Phipps
- Brad Walker
- Jacki Salkeld

**THANK YOU ALL ☺!**

## 13 References

- Bentley, M (2011-2012) Pers.comm Featherdale Wildlife Park Senior Keeper
- Caring for Australian Native Birds, Heather Parsons 1999
- Exhibited Animals Protection Act for Exhibiting Captive Raptors (2005) pp 2-12
- Fong, J (2011-2012) Pers.comm Featherdale Wildlife Park Senior Keeper
- Handbook of Australian New Zealand and Antarctic Birds, Raptors to Lapwings Volume 2  
*S.Marchant and P.J.Higgins 1993(reprinted 2007) Pages 205 - 214*
- Harris, E (2011-2012) Pers.comm Featherdale Wildlife Park Operations Manger
- Hawton, J (2011) Pers.comm Featherdale Wildlife Park Senior Park Curator
- Host, B (2012) Pers.comm Taronga Zoo Sydney
- Hutchings, J (2011-2012) Pers.comm, Featherdale Wildlife Park keeper
- International Air Transport Association (IATA) (2009-2010) Live Animal Regulations: Container Requirements **8** (20): 244-246
- International Union of Conservation of Nature (IUCN) (2012) Red list
- 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.
- John Young Wildlife Enterprises; Australian Birding Video Guides ‘Birds of Prey Part 1’
- Johnson, R (2011) Pers.comm South Penrith Vet Clinic
- Jones, M (2008) Infectious diseases of birds of prey.  
<http://veterinarycalendar.dvm360.com/avhc/Exotic-animal+medicine/Infectious-diseases-of-birds-of-prey-Proceedings/ArticleStandard/Article/detail/557963> viewed 15/10/2011
- M<sup>c</sup>Donald, R (2012) Pers.comm Featherdale Wildlife Park Senior Keeper
- Neasbey, C (2011) Pers.comm Featherdale Wildlife Park Senior Keeper
- NSW Scientific Committee (2009) Square-tailed Kite  
<http://www.environment.nsw.gov.au/resources/nature/schedules/SquareKite.pdf>  
<http://www.environment.nsw.gov.au/resources/nature/schedules/SquareKite.pdf> viewed 03/04/2011



Radnidge, M (2012) Pers.comm Symbio Wildlife Park Manager

Randy, M (2011-2012) Pers.comm Featherdale Wildlife Park Senior Keeper

Tarrent, T (2011) Front cover image

Staples, C (2011-2012) Pers.comm Featherdale Wildlife Park Senior Park Curator

Wasan, R (2012) Pers.comm Feathered Friends

Webb, J (2011-2012) Pers.comm Featherdale Wildlife Park Senior Keeper

Webb, R (2011-2012) Pers.comm Featherdale Wildlife Park Manger

## 14 Bibliography

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.

Raptors in Captivity : Guidelines for Care and Management  
*Lori.R, Arent*

Eagle Heritage: Western Australia

## 15 Glossary

- **Browse-** Small Tree branches
- **Tarsus-** part of the leg of the bird below the thigh.
- **Copulation-** Sexual Intercourse
- **Enrichment-** the act of making an environment/lifestyle more rewarding
- **Offal-** Animals Gut

---

**ARAZPA** Australasian Regional Association of Zoological Parks and Aquaria

**ARKS** Animal Record Keeping System

**ASMP** Australasian Species Management Program

**DPI** Department of Primary Industries

**EAPA** Exhibited Animals Protection Act 1986

**IATA-** International air transport association

**IUCN** International Union for Conservation and Nature

**LC** Least Concern

**NSWFFPA** New South Wales Flora and Fauna Parks Association

**PPE** Personal Protective Equipment

**REGASP** Regional Animal Species Program

**RCP** Regional Census and Plan

**SPARKS** Single Population Animal Record Keeping System

**TAG** Taxon Advisory Group

**WWF** World Wildlife Foundation

**ZAA** Zoos and Aquarium Association

## 16 Appendix

### **Calcium Powder: \$2.00 per kilo (+ 10% GST)**

Aviculture Accessories

91 Vine Street, West Marsden Park, NSW 2765

Phone: (02) 9838 1256

---

### **Petvite Powder: \$60.00 for 5kg (+ 10% GST)**

Aviculture Accessories

91 Vine Street, West Marsden Park, NSW 2765

Phone: (02) 9838 1256

---

### **Cordina Chicken Farms Pty Ltd in Greystanes, New South Wales**

30 Cumberland Rd Greystanes NSW 2145

02 9631 2222

---

### **Catching Nets \$15.00 (+10% GST)**

#### **Padded Catching Net \$33.70 (+10%GST)**

Aviculture Accessories

91 Vine Street, West Marsden Park, NSW 2765

Phone: (02) 9838 1256

---

### **Avian Liquid Insecticide 500mLs concentrates \$40.00 (+10% GST)**

Aviculture Accessories

91 Vine Street, West Marsden Park, NSW 2765

Phone: (02) 9838 1256

---

### **The following drugs will need to be acquired from your Zoo's Veterinarian:**

- Psittavet
  - Roni-Vet
  - Metacam
  - Amoxicillin
  - Baytril
  - Amoxyclav
  - Clavuox
  - Itraconazole capsules (Sporanox)
  - Amphotericin B
- 

### **Knotless Nylon Netting:**

Haverford

Phone: (02) 9771 5288

International: +61297715288

93 Carrington st, Revesby NSW, Australia 2212

Opening hours: 8am – 4pm Monday - Friday

<http://www.haverford.com.au/aviarynetting.html>

---

**Plant File (Horticultural Database)**

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

---

**R Com Pro 50 Digital Incubator**

<http://www.rcomincubators.com/index.php/fuseaction/shop.category/categoryid/124>

---

**Brinsea TLC-4 Brooder**

<http://www.brinsea.com/products/tlc4.html>

---

**Milton Tablets**

Can be purchased from any local chemist

---

**Microwave Sterilizer Kit**

Can be purchased from leading department stores (*eg. Big W, K MART, Woolworths*)

---

# **BIRD HAND REARING CHART**

**Obtained by Featherdale Wildlife Park**

Origin: \_\_\_\_\_

Sex:

[illegible]



# **ENRICHMENT CALENDAR FOR KITES**

**OBTAINED BY TARONGA ZOO SYDNEY**

# Enrichment Calendar for Kites

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
PVC MAR	BL-icle	Leaf Litter	Shower	Ball	Browse	NP	Paper Cup	MW-icle	Stump
11th	12th	13th	14th	15th	16th	17th	18th	19th	20th
Puzzle	CB food	CrBott	NP	Browse	Mulch	Toy	PW	Ice	Dirt Tray
21th	22th	23rd	24th	25th	26th	27th	28th	29th	30th
Bath	Browse	Leaf lit	Troll	P egg	CB	Pin invert	Stump	POPicle	Bam feed

# Enrichment Calendar

## SQUARE - TAILED KITE

[illegible]

## ENRICHMENT ABBREVIATIONS

**Bam Ch** – Bamboo chimes

**Bam Feed** – Bamboo feeder

**Bath toy** – toy in bird bath

**BL – icle** – Blood icle

**Bot Ch** – Bottle chimes

**Bungee** – bungee toy

**CB** – cardboard box

**CB food** – Cardboard box with DFI in it

**Cel tips** – celery tips

**Cone** - Witch's hat/street cone

**Crate food** – milk crate with DFI in it

**CrBott** – Bottle of crickets (5 crickets)

**Ess** – Essential oils

**FL** – native flowers

**FrCage** – Fruit cage (10g fruit)

**FR-icle** – Fruit icle (10g fruit)

**G** – Grass cuttings

**Greens** – chopped mixed green veges (20g)

**HangCob** – Hanging corn cob

**HangFeed** – Hanging feeder

**Ice Bath** – Ice cubes in bird bath

**Leaf lit** – Leaf litter

**MW-icle** – Meal worm icle (5g mw)

**NP** – Newspaper

**Pap cup** – Paper cup

**PC** – Pine cones/banksia pods

**P egg** – pigeon egg

**PH Book** - Phone book

**Pin Invert** - Pinata with invertebrates (5g inverts)

**POP** – Popcorn

**POPicle** – popcorn icle (10g popcorn)

**PVC** – piece PVC pipe

**PVC Mar** – PVC maracas

**PW** – Pigeon wing

**PW- icle** – pigeon wing icle

**SEED-icle** – pigeon seed icle (10g pigeon seed)

**SF – icle** – sunflower icle (5 seeds)

**Shredd** – shredded paper

**SP** – Spices

**Splash** – shower with hoses

**Swap Av** - Swap aviaries

**Troll** – Toilet roll

**Turnover** - turnover substrate

**IATA**  
**LIVE ANIMAL**  
**REGUALTIONS**

**1<sup>st</sup> Oct 2009 – 30<sup>th</sup> Sep 2010**



### CONTAINER REQUIREMENT 20

The illustrations shown in this Container Requirement are examples only. Containers that conform to the principle of written guidelines for the species but look slightly different will still meet the IATA standards.

Applicable to birds of prey  
(including other birds of prey, n.o.s.):

Buzzard species	Hawk species
Caracara	Kestrel species
Condor species	Kite species
Eagle species	Osprey
Falcon species	Owl species
Gyrfalcon	Vulture species
Harrier	

STATE VARIATIONS: AEG-01, AEG-02, CAG-01,  
GBG-01/02/04/06, USG-01

△ OPERATOR VARIATIONS: CO-03/04/05/09, DL-07,  
DL-08, EK-02, EK-03, EK-06, EK-08, GF-02, IR-01,  
IR-02, NW-02, QF-01, SK-01

#### 1. CONTAINER CONSTRUCTION

##### Materials

Wood, hardboard (masonite), non-toxic plastic, fibre-glass and synthetics, weld mesh and strong plastic mesh.

##### Principles of Design

The following principles of design must be met in addition to the General Container Requirements outlined at the beginning of this chapter.

##### Size

The normal habits and necessary freedom of movement of the bird species involved will determine the size.

The height of the container must be sufficient to allow the bird to just be able to stand in a normal position. No head clearance is required for these species because they tend to jump up forcefully if permitted to do so.

The container or compartment of a container must be wide enough so that the bird can turn round without stretching its wings to their full extent.

Multiple-compartment containers can be used provided there is sufficient ventilation.

##### Frame

A solid wood frame, either screwed or nailed and glued with a non-toxic glue, located on the outside.

##### Sides

The sides must be either of wood or hardboard. The front must be double with the outer layer made of weld mesh and the inner layer of a strong plastic mesh with a distance of 4–5 cm (1½–2 in) between them.

The interior of the container must not have sharp edges or protuberances on which the birds can injure themselves.

##### Handling Spacer Bars/Handles

Must be provided as shown in the illustration on four sides of the container.

##### Floor

Solid and leak-proof, it can be covered with carpeting in order to allow the bird to get a firm foothold.

##### Perches

These species can travel safely standing on their feet but small raptors prefer to be off the ground and a wooden block, firmly fixed to the bottom of the container, will allow it to feel secure.

##### Stocking Density

One bird per container or compartment of a container.

##### Roof

Must be padded with a soft non-destructible padding.

##### Door

A vertical or horizontal sliding or hinged door must be constructed to cover the front plastic mesh of the container and it must have at least two observation openings of approximately 5 cm (2 in) in the upper third.

##### Ventilation

Meshed ventilation openings, approximately 2.5 cm (1 in) in diameter must be provided at approximately 5 cm (2 in) distance apart along all four sides of the container. There must be a line of openings near the base large enough to allow some light into the container in order that the bird can see well enough to eat while remaining in semi-darkness. The openings must be covered by external wiremesh but care must be taken that there are no sharp edges present within the container, all edges must be covered with a smooth material.

##### Feed and Water Containers

Water containers must be provided, they must be accessible for refilling.

These birds feed from the floor so do not require food troughs.

Soldered tin must never be used.



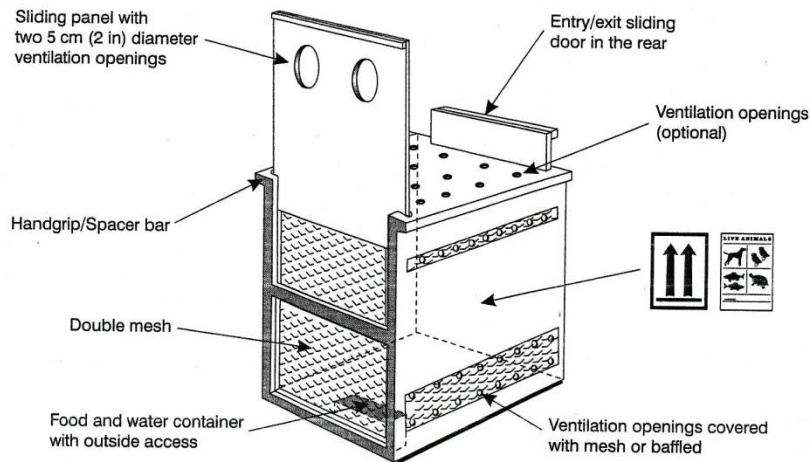
## Rigid Plastic Pet Containers (see Container Requirement 1)

A modified rigid plastic pet containers is suitable for use. The following modifications must be made:

- a fixed foothold blocks or non-slip floor lining must be fixed appropriately to the floor of the container;
- non-destructible padding must be fixed to the roof;
- the doors and ventilation openings must be baffled with a suitable material to permit air to enter but keep the container in semi-darkness;

- an observation opening/flap into the container must be present;
- a suitable water container must be fixed inside the container with a means of refilling;
- labelling must conform to IATA standards for Live Animals;
- if a container has wheels, they must be removed or rendered inoperable.

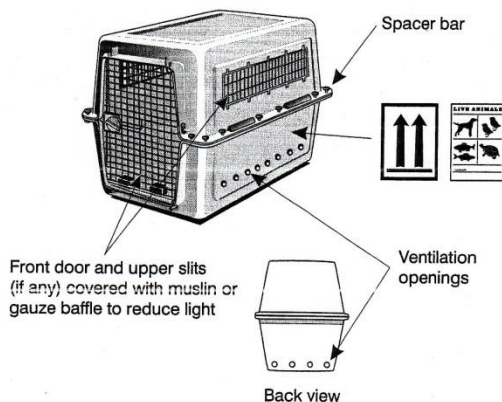
### EXAMPLE:



### Note:

Food and water troughs must be provided.

### TYPICAL RIGID PLASTIC CONTAINER



## 2. PREPARATIONS BEFORE DISPATCH (see Chapter 5)

It is advisable that shippers must ensure that wild birds have been held after capture for approximately thirty days before dispatch to overcome the stress of capture and allow them to become accustomed to confinement and their new diet. It is of the utmost importance that all birds be given, under close supervision, an opportunity to drink an ample supply of water before departure.

These species are shipped one per compartment of a multiple container or one per container. The only exception to this rule is when nestlings are being moved for a specific reason which must be cleared with the relevant authorities at the time of reservation.

Falcons and hawks — the bird must be given its normal food prior to dispatch which must be sufficient up to 24 hours. The tail feathers of these birds damage easily. Adhesive brown paper strips (not plastic tape) bound around the tail feathers for protection, which can be soaked off at the end of the journey, have been used successfully.



## Live Animals Regulations

### 3. FEEDING AND WATERING GUIDE (for emergency use only)

Birds do not usually require additional feeding during 24 hours following the time of dispatch.

If feeding is required due to an unforeseen delay, chunks of raw meat or fish (no live food) must be provided for eagles, falcons, hawks and owls. For falcons and hawks, the raw meat must be provided in chunks sufficiently large to permit the bird to grip the food. Moisture is normally obtained from the food, therefore, water must only be offered in very hot weather.

This species eat from the floor and shippers instructions on feeding must be followed.

### 4. GENERAL CARE AND LOADING (see Chapters 5 and 10)

Birds are very nervous by nature and containers must be handled carefully. The container must not be jolted and unnecessary tilting must be avoided. Birds must be provided with water at the time of departure, transfer, layover and at destination.

Birds will not feed in the dark and must be stowed in at least dim light sufficient for them to see their food.

Falcons and hawks — disturbance of these birds must be kept to a minimum as they are easily frightened and this could have harmful consequences. These birds react with speed and violence in fright; the container must be opened only for exceptional reasons and only by an experienced raptor handler.

The ventilation openings may be covered with a light material, such as muslin that does not occlude the ventilation, in order to reduce the amount of light inside the container.



# **MSDS: POWER PLUS DISINFECTANT DEODORISER**

86 VICTORIA ST SMITHFIELD NSW 2164  
PH: (02) 9757 2015 FAX: (02) 9725 5218  
A.C.N: 053 718 386 A.B.N: 48 053 778 386

# EGYPCO CHEMICALS

## MATERIAL SAFETY DATA SHEET

NON HAZARDOUS ACCORDING TO WORKSAFE AUSTRALIA  
PAGE: 1 OF 3  
DATE OF ISSUE: 26/7/01

### IDENTIFICATION

PRODUCT NAME: POWER PLUS DISINFECTANT DEODORISER  
PRODUCT CODE: PP-D\_  
USE: DISINFECTANT AND LIGHT GENERAL CLEANER

### DESCRIPTION

POWER PLUS DISINFECTANT DEODORISER is a commercial grade disinfectant, which is ideal for disinfecting, deodorizing and cleaning all hard surfaces, leaving a pleasant residual fragrance.

### FEATURES AND BENEFITS

- Many varieties including: pine, lemon, musk, spices, apple, tutti-fruity & eucalyptus.
- Contains Antibacterial Agent.
- All products are biodegradable.

### IDENTIFICATION

UN NUMBER: NOT APPLICABLE  
DANGEROUS GOODS CLASS: NOT APPLICABLE  
SUBSIDIARY RISK: NOT APPLICABLE  
HAZCHEM CODE: NOT APPLICABLE  
PACKING GROUP: NOT APPLICABLE  
IERG NUMBER: NOT APPLICABLE  
POISONS SCHEDULE: NOT APPLICABLE

July 26, 2001

Page 2

**M.S.D.S**

PRODUCT NAME:

POWER PLUS DISINFECTANT DEODORISER

**PHYSICAL DESCRIPTION/PROPERTIES**

APPEARANCE: THIN LIQUID WITH A STRONG FRAGRANCE  
BOILING POINT (\*C): ~100\*C  
MELTING POINT (\*C): 0\*C  
VAPOUR PRESSURE: NOT APPLICABLE  
SPECIFIC GRAVITY: 1000 ± 0.01  
FLASHPOINT (\*C): NOT APPLICABLE  
FLAMMABILITY LIMITS (%): NOT APPLICABLE  
SOLUBILITY IN WATER (g/L): FREELY SOLUBLE IN WATER  
PH LEVEL: 7 - 7.5

**INGREDIENTS**

CHEMICAL ENTITY:	CAS NUMBER	PROPORTION
Alkyl Dimethyl Benzyl		
Ammonium Chloride	68424-85-1	1.6%
Nonionic Surfactant	9016-45-9	1-10%
Fragrance		<1%

**HEALTH HAZARD INFORMATION**

- If swallowed may cause abdominal pain and nausea.
- A mild irritant to eye. Will cause discomfort and reddening of eyes.
- Non-hazardous to skin, avoid prolonged contact though.
- Not volatile if inhaled.

**FIRST AID**

- If poisoning occurs, contact a doctor or Poisons Information Centre.
- If affected by inhalation remove from contaminated area. Apply artificial respiration if not breathing.
- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- If swallowed DO NOT induce vomiting. Give a glass of water. Seek medical attention.
- In case of accident or if you feel very unwell, seek medical advice immediately.

July 26, 2001  
Page 3

**M.S.D.S.**

PRODUCT NAME:

POWER PLUS DISINFECTANT DEODORISER

**SAFE HANDLING INFORMATION**

- DO NOT mix this product with disinfectant or bleach.
- Keep container closed when not in use.
- Store in a cool place.
- Slippery when split.
- Avoid accidents clean up immediately.
- Contain using sand or soil.
- Wash down with copious volume of water.
- NOT flammable.
- Rubber gloves may be worn to minimize any risks.

**OTHER INFORMATION**

- This product is TGA approved at dilution of 1:20 with water.
- All the ingredients used in this product are biodegradable.

**IN AN EMERGENCY CALL 000 OR NATIONAL POISONS CENTRE. PH: 131 126**

# **MSDS: ECLIPSE LIQUID CHLORINE**



To:

From:

Fax:

at: 07-07-10-08:10 Doc: 038 Page: 002

## Material Safety Data Sheet



*This material is hazardous according to criteria of NOHSC.*

*Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail.*

### 1. Identification of the substance/preparation and of the company/undertaking

**Product Name:** ORICA ECLIPSE GRANULATED CHLORINE FOR SWIMMING POOLS

**Supplier:** Orica Australia Pty Ltd

**ABN:** 004 117 828

**Street Address:** 1 Nicholson Street,  
Melbourne 3000  
Australia

**Telephone Number:** +61 3 9665 7111

**Facsimile:** +61 3 9665 7937

**Emergency Telephone:** 1 800 033 111 (ALL HOURS)

### 2. Composition/information on ingredients

**Product Description:** Swimming pool chemical, algicide, biocide, oxidant.  
White solid with a chlorine odour.

Calcium hypochlorite 7778-54-3	>60%	R8, R22, R31, R34, R41, R50
-----------------------------------	------	-----------------------------

### 3. Hazards identification

**Risk Phrases:** Contact with combustible material may cause fire. Harmful if swallowed. Contact with acids liberates toxic gas. Causes burns. Risk of serious damage to eyes. Very toxic to aquatic organisms.

**Poisons Schedule:** S6 Poison.

### 4. First-aid measures

For advice, contact a Poisons Information Centre (Phone eg. Australia 131 126; New Zealand 0 800 764766) or a doctor.

**Inhalation:** Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discoloration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

**Skin Contact:** If skin or hair contact occurs, immediately remove any contaminated clothing and wash skin and hair thoroughly with running water. If swelling, redness, blistering or irritation occurs seek medical assistance.

**Eye Contact:** Immediately wash in and around the eye area with large amounts of water for at least 15 minutes.

**Product Name:** ORICA ECLIPSE GRANULATED CHLORINE FOR SWIMMING POOLS  
**Substance No:** 000031064512

**Issued:** 13/11/2003

**Version:** 3

To:

From:

Fax:

at: 07-07-10-08:10 Doc: 038 Page: 003



## Material Safety Data Sheet

**Exposure:** Eyelids to be held apart. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to hospital or medical centre.

**Ingestion:** Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.

**Notes to physician:** Treat symptomatically. Can cause corneal burns. Delayed effects from exposure to chlorine (decomposition product) can include shortness of breath, severe headache, pulmonary oedema and pneumonia.

### 5. Fire-fighting measures

**Specific Hazards:** Non combustible, but will support combustion of other materials.

**Fire-fighting advice:** Not combustible, however will support the combustion of other materials. Calcium hypochlorite is a powerful oxidising agent and decomposes violently upon heating liberating oxygen, and toxic chlorine gas. In case of fire, area must be evacuated and specialist fire fighters called. Only large quantities of water should be used as an extinguishing agent. If excess water is not available DO NOT attempt to extinguish the fire; use available water to prevent the spread of fire to adjacent property. Attending fire fighters should keep upwind if possible and wear full protective equipment including rubber boots and self-contained breathing apparatus. A fire in the vicinity of calcium hypochlorite should be extinguished in the most practical manner but avoid contaminating this material with the fire fighting agent, including water. Decomposes on contact with water evolving toxic chlorine gas. Once fire is extinguished, wash area thoroughly with excess water. Ensure that drains are not blocked with solid material. Maintenance of excess water during cleaning up operation is essential. Combustible material involved in the incident should be removed to a safe open area for controlled burning or for further drenching with water prior to collection for disposal.

**Suitable Extinguishing Media:** Water spray (large quantities).

### 6. Accidental release measures

Wear protective equipment to prevent skin and eye contact and breathing in vapours/dust. Air-supplied masks are recommended to avoid inhalation of toxic material. DO NOT return spilled material to original container. DO NOT add small amounts of water to calcium hypochlorite. Sweep up, avoiding generation of dust, then immediately spread as a thin layer in uncontaminated, dry, open area to reduce the possibility of local hot spots forming.

Where a spill has occurred in a confined space or an inadequately ventilated enclosure and the material is damp and evolving chlorine, the rate of chlorine evolution can be reduced by covering the thinly spread solid with soda ash. For large spills notify the Emergency Services.

### 7. Handling and storage

**Handling advice:** Avoid skin and eye contact and breathing in dust. Keep out of reach of children.

**Storage advice:** Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from foodstuffs. Store away from incompatible materials described in Section 10. Keep dry - reacts with water, may lead to drum rupture. Keep containers closed when not in use - check regularly for spills.

This material is a Scheduled Poison S6 and must be stored, maintained and used in accordance with the relevant regulations.

**Product Name:**  
**Substance No:**

**ORICA ECLIPSE GRANULATED CHLORINE FOR SWIMMING POOLS**  
**000031064512**

**Issued:** 13/11/2003

**Version:** 3



To:

From:

Fax:

at: 07-07-10-08-10 Doc: 038 Page: 004



## Material Safety Data Sheet

### 8. Exposure controls/personal protection

#### Occupational Exposure Limits:

No value assigned for this specific material by the National Occupational Health and Safety Commission. However, Exposure Standard(s) for decomposition product(s):

Chlorine: Peak Limitation = 3 mg/m<sup>3</sup> (1 ppm)

As published by the National Occupational Health and Safety Commission.

Peak Limitation - a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes.

These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

#### Engineering Control Measures:

Ensure ventilation is adequate and that air concentrations of decomposition product(s) is/are controlled below quoted Exposure Standards. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

#### Personal Protective Equipment:

Orica Personal Protection Guide No. 1, 1998: F - OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.

Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

### 9. Physical and chemical properties

<b>Physical state:</b>	Solid
<b>Colour:</b>	White
<b>Odour:</b>	Chlorine
<b>Molecular Formula:</b>	Ca(OCl) <sub>2</sub>
<b>Solubility:</b>	Soluble in water.
<b>Specific Gravity:</b>	2.1
<b>Relative Vapour Density (air=1):</b>	Not available
<b>Vapour Pressure (20 °C):</b>	Not available
<b>Flash Point (°C):</b>	Not available
<b>Autoignition Temperature (°C):</b>	Not available
<b>% Volatile by Weight:</b>	Not available
<b>Solubility in water (g/L):</b>	Not available
<b>Boiling Point/Range (°C):</b>	Not available
<b>Decomposition Point (°C):</b>	Not available
<b>pH:</b>	11.5 (5% aqueous solution)

### 10. Stability and reactivity

**Stability:** Powerful oxidising agent. Calcium hypochlorite (dry or hydrated) and its mixtures are incompatible with



To:

From:

Fax:

at: 07-07-10-08:10 Doc: 038 Page: 005

# Material Safety Data Sheet



dichloroisocyanuric acid, ammonium nitrate, trichloroisocyanuric acid, or any chloroisocyanurate. Reacts with water liberating chlorine.

## 11. Toxicological information

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

- Ingestion:** Swallowing can result in nausea, vomiting, diarrhoea, abdominal pain and chemical burns to the gastrointestinal tract.
- Eye contact:** A severe eye irritant. Corrosive to eyes; contact can cause corneal burns. Contamination of eyes can result in permanent injury.
- Skin contact:** Contact with skin will result in severe irritation. Corrosive to skin - may cause skin burns.
- Inhalation:** Breathing in dust may result in respiratory irritation. Chlorine, evolved from decomposition when wet, is a severe respiratory irritant, corrosive, and highly toxic. Delayed effects can include shortness of breath, headache, pulmonary oedema, and pneumonia.

### Long Term Effects:

No information available for the product.

### Toxicological Data:

Oral LD50 (rat): 850 mg/kg.

## 12. Ecotoxicological information

Avoid contaminating waterways.

### Environmental fate, persistence and degradation:

This material is biodegradable.

### Aquatic toxicity:

Very toxic to aquatic organisms. 24hr LC50 (striped bass larvae) = 0.7 mg/L

### Terrestrial toxicity:

Expected to be harmful to terrestrial species.

## 13. Disposal considerations

Refer to Waste Management Authority. Dispose of material through a licensed waste contractor. Clean containers with water.

## 14. Transport information

### Road and Rail Transport

Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail.

UN No: 2880

Class-primary 5.1 Oxidizing Agent.

Product Name:  
Substance No:

ORICA ECLIPSE GRANULATED CHLORINE FOR SWIMMING POOLS  
000031064512

Issued:

13/11/2003

Version:

3

To:

From: \_\_\_\_\_

Fax:

at: 07-07-10-08-10 Doc: 038 Page: 006

## Material Safety Data Sheet



**Packing Group:** II  
**Proper Shipping Name:** CALCIUM HYPOCHLORITE, HYDRATED

**Hazchem Code:** 2W

### Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

This material is classified as a Marine Pollutant (P) according to the International Maritime Dangerous Goods Code.

**UN No:** 2880  
**Class-primary:** 5.1 Oxidizing Agent  
**Packing Group:** II  
**Proper Shipping Name:** CALCIUM HYPOCHLORITE, HYDRATED

### Air Transport

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

**UN No:** 2880  
**Class-primary:** 5.1 Oxidizing Agent  
**Packing Group:** II  
**Proper Shipping Name:** CALCIUM HYPOCHLORITE, HYDRATED

## 15. Regulatory information

**Classification:** This material is hazardous according to criteria of NOHSC.  
 Xn: Harmful  
 C: Corrosive

**Risk Phrase(s):** R8: Contact with combustible material may cause fire.  
 R22: Harmful if swallowed.  
 R31: Contact with acids liberates toxic gas.  
 R34: Causes burns.  
 R41: Risk of serious damage to eyes.  
 R50: Very toxic to aquatic organisms.

**Safety Phrase(s):** S24/25: Avoid contact with skin and eyes.  
 S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
 S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.  
 S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).  
 S61: Avoid release to the environment. Refer to special instructions safety data sheets.

**Poisons Schedule:** S6 Poison.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

To:

From:

Fax:

at: 07-07-10-08:10 Doc: 038 Page: 006



## Material Safety Data Sheet

**Packing Group:** II  
**Proper Shipping Name:** CALCIUM HYPOCHLORITE, HYDRATED

**Hazchem Code:** 2W

### Marine Transport

Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

This material is classified as a Marine Pollutant (P) according to the International Maritime Dangerous Goods Code.

**UN No:** 2880  
**Class-primary:** 5.1 Oxidizing Agent  
**Packing Group:** II  
**Proper Shipping Name:** CALCIUM HYPOCHLORITE, HYDRATED

### Air Transport

Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

**UN No:** 2880  
**Class-primary:** 5.1 Oxidizing Agent  
**Packing Group:** II  
**Proper Shipping Name:** CALCIUM HYPOCHLORITE, HYDRATED

## 15. Regulatory information

**Classification:** This material is hazardous according to criteria of NOHSC.  
 Xn: Harmful  
 C: Corrosive

**Risk Phrase(s):** R8: Contact with combustible material may cause fire.  
 R22: Harmful if swallowed.  
 R31: Contact with acids liberates toxic gas.  
 R34: Causes burns.  
 R41: Risk of serious damage to eyes.  
 R50: Very toxic to aquatic organisms.

**Safety Phrase(s):** S24/25: Avoid contact with skin and eyes.  
 S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
 S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.  
 S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible).  
 S61: Avoid release to the environment. Refer to special instructions safety data sheets.

**Poisons Schedule:** S6 Poison.

This material is listed on the Australian Inventory of Chemical Substances (AICS).

**Product Name:** ORICA ECLIPSE GRANULATED CHLORINE FOR SWIMMING POOLS  
**Substance No:** 000031064512

**Issued:** 13/11/2003

**Version:** 3



To:

From:

Fax:

at: 07-07-10-08:10 Doc: 038 Page: 007

## Material Safety Data Sheet



### 16. Other information

'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, 2003.  
In: 'The Dictionary of Substances and their Effects'. Ed. Gangolli S. Royal Society of Chemistry, 1999.

**Reason(s) for Issue:**

Change to Poisons Requirements

This MSDS summarises to our best knowledge at the date of issue, the chemical health and safety hazards of the material and general guidance on how to safely handle the material in the workplace. Since Orica Limited cannot anticipate or control the conditions under which the product may be used, each user must, prior to usage, assess and control the risks arising from its use of the material.

If clarification or further information is needed, the user should contact their Orica representative or Orica Limited at the contact details on page 1.

Orica Limited's responsibility for the material as sold is subject to the terms and conditions of sale, a copy of which is available upon request.

# **MSDS: Racumin® RAT AND MOUSE BLOCKS**

**MATERIAL SAFETY DATA SHEET****Racumin® Rat and Mouse Blocks**Date of Issue: September 12<sup>th</sup>, 2006**1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND SUPPLIER**

**Product name:** Racumin® Rat and Mouse Blocks  
**Other names:** None  
**Product code:** 4940619 (5 kg)  
**Chemical group:** Coumatrin  
**Recommended use:** Prepared rodenticide bait block for rat and mouse control.  
**Formulation:** Bait  
**Supplier:** Bayer Environmental Science – A Business Group of Bayer CropScience Pty  
 ABN 87 000 226 022  
**Address:** 391 - 393 Tooronga Road, East Hawthorn  
 Victoria 3123, Australia  
**Telephone:** (03) 9248 6888  
**Facsimile:** (03) 9248 6800  
**Website:** [www.bayercropscience.com.au](http://www.bayercropscience.com.au)  
**Contact:** Technical Manager (03) 9248 6888  
**Emergency**  
**Telephone Number:** 1800 033 111 – Orica SH&E Shared Services

**2. HAZARDS IDENTIFICATION****NON-HAZARDOUS SUBSTANCE - NON-DANGEROUS GOOD**

Not irritating. Not flammable.

**Hazard designation:** Non-hazardous (National Occupational Health and Safety Commission - NOI)  
**Risk phrases:** Not applicable.  
**Safety phrases:** See Sections 4, 5, 6, 7, 8, 9, 13  
**ADG classification:** Not "dangerous goods" for transport by road or rail according to the Australia Transport of Dangerous Goods by Road and Rail.  
**SUSDP classification:** Schedule 5 (Standard for the Uniform Scheduling of Drugs and Poisons)

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

Ingredients:	CAS Number:	Concentration (%)
Coumatetralyl	[5836-29-3]	0.37
Talc	[14807-96-6]	50
Other ingredients (non-hazardous)	-	To 1 Kg



**MATERIAL SAFETY DATA SHEET****Racumin® Rat and Mouse Blocks**Date of Issue: September 12<sup>th</sup>, 2006**4. FIRST AID MEASURES**

If poisoning occurs, immediately contact a doctor or Poisons Information Centre (Telephone 13 follow the advice given. Show this Material Safety Data Sheet to a doctor.

Inhalation:	Presentation as a solid block makes inhalation unlikely
Skin contact:	Wash skin with soap and water.
Eye contact:	Hold eyes open and flush with clean water for at least 15 minutes.
Ingestion:	If poisoning via the oral route occurs, seek immediate medical advice. As the of coumatetralyl in the final product is very low, large amounts of the product be ingested.
First Aid Facilities:	Provide washing facilities in the workplace (including eye-wash).
Symptoms:	Symptoms of overexposure relate to failure of the blood clotting mechanism: bleeding gums and failure of blood clotting after skin wounds.
Medical attention:	Coumatetralyl inhibits vitamin K1-dependant coagulation.

Symptoms

Symptoms after ingestion (though also toxic via the dermal route) may range increased bleeding tendency (e.g. gingiva bleeding or nose bleeding) to mass haemorrhage in severe cases. Hematuria, bruisability, vomiting blood, cerebral bleeding are possible.

Treatment

Elementary aid, decontamination and symptomatic treatment.

Note for physicians

Gastric lavage should be performed in cases of significant ingestions, followed administration of activated charcoal and sodium sulfate. The antidote for coumatetralyl is vitamin K1. The efficacy of vitamin K1 treatment should be assessed by monitoring coagulation parameters, such as prothrombin time or INR. Initial treatment must be with intravenous vitamin K1 in severe cases, while usually oral vitamin K1 should be sufficient. Severe poisoning cases may require the initial application of blood products:

- whole blood
- fresh frozen plasma and fresh blood should be used in cases of severe bleeding to rapidly restore blood clotting factors

Transfusions may be required in cases of significant blood loss.

It is expected that repeated intake of coumatetralyl would be required to cause poisoning, yet it is prudent to control coagulation parameters for several days after ingestions.



**MATERIAL SAFETY DATA SHEET****Racumin® Rat and Mouse Blocks**Date of Issue: September 12<sup>th</sup>, 2006**5. FIRE FIGHTING MEASURES**

Extinguishing media: Water spray, carbon dioxide, foam, sand.

Hazards from combustion products: In a fire, carbon monoxide may be released.

Precautions for fire fighters: Fire fighters should wear full protective gear, including self-contained breathing apparatus (AS/NZS 1715/1716). Keep unnecessary people away and move all other people to the windward side of fire. Bund area with sand or earth to prevent contamination of waterways. Dispose of fire control water or other extinguishing agent and spillage later.

**6. ACCIDENTAL RELEASE MEASURES**

Dealing with spills and disposals may result in the potential for increased personal exposure. Protective equipment as described in the PERSONAL PROTECTION section should be worn. Avoid contact with material or contaminated surfaces. Keep people and animals away. Prevent spillage from spreading into waterways and drains. Work from up-wind side of spill. Do not inhale dust. Sweep and shovel up spill, along with any contaminated soil etc., into sealable containers. Clean affected area with an aqueous solution of a small amount of water. Absorb this with hydrated lime and place in a sealable drum. Spread hydrate over the affected area. Do not smoke, eat or drink during clean-up operation.

**7. HANDLING AND STORAGE**

Handling: Keep out of reach of children. Should not be used in areas accessible to children. Poisonous if swallowed.

Storage: Store in the tightly closed, original container in a dry, well-ventilated area, as possible out of direct sunlight. Destroy untaken baits. Any spillage of bait should be removed immediately. Break, crush, or puncture and bury empty containers in an authority landfill. If not available bury the container below 500mm in a disposal area specifically marked and set up for this purpose clear of waterways, vegetation.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

Exposure standards: NOHSC exposure standards have not been established for the active constituent in this formulation except:  
Talc TWA 2.5 mg/m<sup>3</sup> (NOHSC)

Engineering controls: No engineering controls are required for normal use of this product according to the label.

Personal Protective Equipment: Wear rubber or PVC gloves when handling the blocks.  
If product on skin and after each baiting, wash thoroughly with soap and water.



**MATERIAL SAFETY DATA SHEET****Racumin® Rat and Mouse Blocks**Date of Issue: September 12<sup>th</sup>, 2006**9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance: Blue block  
Odour: No specific odour  
Vapour pressure:  $8.5 \times 10^{-6}$  mPa (20°C) (coumatetralyl)  
Vapour density: Not relevant  
Melting point: 172 – 176 °C (coumatetralyl)  
Solubility in water: 425 mg/L at 20°C

Density: Approx 1 kg/L  
pH: Not relevant  
Flash Point: Not relevant  
Flammability: Not relevant  
(explosive) limits:  
Auto-ignition temperature: Not relevant  
Octanol/water partition coefficient: Not available  
Formulation: Ready to use bait block

**10. STABILITY AND REACTIVITY**

Chemical stability: Stable under normal conditions of use.  
Hazardous polymerisation: Hazardous polymerisation will not occur  
Conditions to avoid: Keep away from heat or moisture.

Incompatible materials: Avoid strong oxidising agents.

Hazardous decomposition products: In the event of a fire, carbon monoxide gas may be released.

**MATERIAL SAFETY DATA SHEET****Racumin® Rat and Mouse Blocks**Date of Issue: September 12<sup>th</sup>, 2006**11. TOXICOLOGICAL INFORMATION****POTENTIAL HEALTH EFFECTS**

Inhalation:	Coumatetralyl is poisonous by inhalation, however presentation as a soft block containing 0.0375% coumatetralyl makes inhalation unlikely.
Skin contact:	Not a skin irritant
Eye contact:	Not an eye irritant
Ingestion:	Refer below
Other:	Coumatetralyl is a first generation anticoagulant of the warfarin type. Symptomatic overexposure relate to failure of the blood clotting mechanism and include bleeding and failure of blood clotting after skin wounds. After one exposure the toxicity of coumatetralyl is relatively low, however if exposure continues over several days the product becomes more toxic. That is, the product must be constantly present for more than 1 to 2 days in order to be highly toxic. A single exposure, even relatively large, may not produce toxic symptoms as the compound is quite readily metabolised.

**ANIMAL TOXICITY DATA – ACTIVE INGREDIENT:****Acute:**

Oral toxicity:	Acute oral LD <sub>50</sub> : Rat 16.5 mg/kg [Sub-chronic oral LD <sub>50</sub> (5 d): Rat 0.3 mg/kg/day]
Dermal toxicity:	Acute percutaneous LD <sub>50</sub> rat: 100 - 500 mg/kg
Inhalation toxicity:	LC <sub>50</sub> (4 h) for rats 39 mg/m <sup>3</sup>
Skin irritation:	Coumatetralyl is not classified as a skin irritant
Eye irritation:	Coumatetralyl is not classified as an eye irritant
Sensitisation:	Coumatetralyl is not classified as a skin sensitiser

**Chronic:**

The toxicity of this product is greater after repeated exposure than in a single dose. Animal tests have shown coumatetralyl not to have any carcinogenic or teratogenic potential.



**MATERIAL SAFETY DATA SHEET****Racumin® Rat and Mouse Blocks**Date of Issue: September 12<sup>th</sup>, 2006**12. ECOLOGICAL INFORMATION**

Do not allow dogs, cats or other mammals to contact this product.  
No other ecological data available.

Fish toxicity:	LC <sub>50</sub> (96h) 48 mg/L (rainbow trout) (coumatetralyl)
Daphnia toxicity:	LC <sub>50</sub> (48h) >14 mg/L (coumatetralyl)
Toxicity to algae:	E <sub>10</sub> >18 mg/L (coumatetralyl)
Bird toxicity:	Acute oral LD <sub>50</sub> for Japanese Quail >2000 mg/kg bw. Dietary LC <sub>50</sub> (8d) for hens >50 mg/kg bw daily (coumatetralyl)
Bee toxicity:	Not available
Environmental fate, persistence and degradation:	Rapidly decomposed in aqueous solutions exposed to sunlight or UV light: D (coumatetralyl).

**13. DISPOSAL CONSIDERATIONS**

- 1) After intended use: Break, crush or puncture and bury empty containers in a local authority lar available, bury the containers below 500 mm in a disposal pit specifically marked and set up for this purpose, waterways, vegetation and roots. Empty containers and product should not be burnt.
- 2) After spill or accident: Dispose of sealed containers at an approved local waste disposal site.

**14. TRANSPORT INFORMATION**

UN number:	Not applicable
Proper shipping name:	Not applicable
Class and Subsidiary Risk:	Not "dangerous goods" for transport by road or rail according to the Australian Transport of Dangerous Goods by Road and Rail.
Packing Group:	Not applicable
EPG:	Not applicable
Hazchem code:	Not applicable

**15. REGULATORY INFORMATION**

Registered according to the Agricultural and Veterinary Chemicals Act 1988  
Australian Pesticides and Veterinary Authority Approval Number: 52098

**MATERIAL SAFETY DATA SHEET****Racumin® Rat and Mouse Blocks**Date of Issue: September 12<sup>th</sup>, 2006**16. OTHER INFORMATION****Trademark****information:**

Racumin® is a Registered Trademark of Bayer

**Preparation****information:**

Replaces May 15 2004 edition.

Reason for update: Hazards Identification, Formulation Composition, First Aid Hazards from Combustion Products, Accidental Release Measures, Storage.

**Data sources:**

Bayer CropScience Pty Ltd product safety data and published data

This MSDS summarises our best knowledge of the health and safety hazard information of the product safely handle and use the product in the workplace. Each user should read this MSDS and consider this in the context of how the product will be handled and used in the workplace including in conjunction with products.

If clarification or further information is needed to ensure that an appropriate risk assessment can be made should contact this company.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to customers and is also available on request.

END

# **STANDARDS FOR EXHIBITING CAPTIVE RAPTORS IN NEW SOUTH WALES**

## **EAPA STANDARDS**

# **Standards for Exhibiting Captive Raptors in New South Wales**

---

**Exhibited Animals Protection Act**

A publication of the Director-General, NSW Department of Primary Industries  
pertaining to the conditions of display of captive raptors  
(pursuant to Clause 8(1) of the *Exhibited Animals Protection Regulation 2005*).

Republished in May 2010

**1.1 GENERAL REQUIREMENTS****1.1.1 Construction**

- a) Enclosures shall be constructed of such materials and be maintained in sufficiently good repair to ensure that they will contain the animals at all times and are to be safe for the animals, for the staff attending them and for the public.
- b) Enclosures shall include a covered shelter, enclosed by weatherproof walls which provide roost security and protection from wind, rain and extremes in temperature and sunlight.
- c) Enclosures for raptors shall include a water mist spray or allow the birds access to rain.
- d) Enclosures shall be well drained and have either a readily cleanable substrate or be of a material which can be replaced to avoid the accumulation of faeces, urates, fungi and moulds.
- e) Mesh netting surfaces for raptor enclosures shall preferably be of flexible nylon. Wire mesh shall be flexible to reduce the impact of birds colliding with it. Wire roof surfaces should be as near to horizontal as possible.
- f) The size and shape of enclosures for raptors shall provide freedom of movement, both vertically and horizontally and should not fall below the minimum requirements set forth under 1.1.5.
- g) Access to raptor enclosures should be through a double door safety entrance. Doors are to be self-closing and locked upon exiting.

**1.1.2 Treatment Facilities**

Suitable low light, warm isolation facilities shall be available for treatment of sick animals.

**1.1.3 Inter-and Intra-Specific Interaction (Aggression Reduction)**

- a) Raptor species of similar size and hunting capacity may be held together in the same enclosure if they are not noted for inter-specific aggression.



- b) If a raptor is being dangerously stressed by the aggression/presence of other raptor(s) of its own or other species in the enclosure, then arrangements shall be made for it to be housed separately from the other raptor(s) causing the stress.

#### 1.1.4 Enclosure Furniture

- a) The total number of perches and/or ledges shall outnumber the number of birds in an aviary.
- b) Perch(es)/ledge(s) in the covered shelter shall be placed so that a raptor resting on one of these may avoid visual contact with raptors in adjoining enclosures. All perches should be placed so that birds in adjoining enclosures cannot perch within reach of each other through cage wire.
- c) Perches/ledges should be placed so as to encourage the raptors to make maximum use of the flight possibilities within the enclosure. At least one perch should be no less than two(2) metres from the ground.
- d) Competition for the highest vantage point shall be avoided by providing a number of perches at that height.
- e) In addition to the requirements of (a), a number of stumps may also be provided. Enclosures containing raptors which are incapable of normal flight should include rough-barked branches which permit the birds to climb to perches from the substrate.
- f) All perches/ledges/tree stumps shall be placed so that birds can perch comfortably without their plumage coming into contact with walls or fixtures.
- g) Perches shall be constructed from uncontaminated natural branches and vary in diameter and cross-section so that at least some shall have circumferences not less than the talon span of the species to be housed.
- h) Each nocturnal hole-nesting owl shall be provided with at least a darkened corner to hide from the light and provide roost security. Provision of a suitable hollow log is recommended.
- i) Where enclosures contain male and female raptors, sight barriers shall be provided so that the sexes can isolate themselves visually.
- j) Perches must be no closer to the roof of the enclosure than that distance which is needed for the bird's wing to go through its natural arc during take-off and landing.
- k) Perches in breeding enclosures should be positioned so that there is sufficient overhead clearance for copulation.
- l) An aviary for the housing of raptors shall contain a bathing pond/container with a diameter sufficient to allow normal bathing behaviour and a depth not greater than 15cm and not less than 5cm.

- m) The pond/container shall have a non-slip, cleanable surface and no sharp edges.
- n) The pond/container shall be kept filled with clean fresh water or where the length of the legs of the shortest bird is less than 15cm to a depth equal to the length of that bird's legs.

#### 1.1.5 Space Requirements

An aviary for the housing of raptors shall be of the following minimum size standards:

Name	Width(M)	Length(M)	Height(M)
------	----------	-----------	-----------

#### ORDER CATHARTIFORMES

##### Family: Cathartidae

Andean Condor <i>Vultur gryphus</i>	6	15	5
-------------------------------------	---	----	---

#### ORDER ACCIPITRIFORMES

##### Family: Pandionidae

Osprey <i>Pandion haliaetus</i>	3.5	8	4
---------------------------------	-----	---	---

##### Family: Accipitridae

Black-shouldered Kite <i>Elanus notatus</i>	2.5	6	4
---	-----	---	---

Letter-winged Kite <i>Elanus scriptus</i>	2.5	6	4
---	-----	---	---

Black Kite <i>Milvus migrans</i>	3	8	4
----------------------------------	---	---	---

Square-tailed Kite <i>Lophoictinia isura</i>	3	8	4
--	---	---	---

Black-breasted Buzzard <i>Hamirostra melanosternon</i>	3.5	8	4
---	-----	---	---

Brahminy Kite <i>Haliastur indus</i>	3	8	4
--------------------------------------	---	---	---

Whistling Kite <i>Haliastur sphenurus</i>	3	8	4
---	---	---	---

Collared Sparrowhawk <i>Accipiter cirrhocephalus</i>	3	8	4.5
Brown Goshawk <i>Accipiter fasciatus</i>	3.5	10	4.5
Grey Goshawk <i>Accipiter novaehollandiae</i>	3.5	10	4.5
Red Goshawk <i>Erythrotriorchis radiatus</i>	4	10	4.5
Little Eagle <i>Hieraaetus morphnoides</i>	3	8	4
Wedge-tailed Eagle <i>Aquila audax</i>	5.5	10	4.5
White-breasted Sea Eagle <i>Haliaeetus leucogaster</i>	5	10	4.5
Spotted Harrier <i>Circus assimilis</i>	3	8	4
Swamp Harrier <i>Circus aeruginosus</i>	3	8	4
Crested Hawk (Pacific Baza) <i>Aviceda subcristata</i>	2.5	6	4

#### ORDER FALCONIFORMES

##### Family: Falconidae

Australian Hobby <i>Falco longipennis</i>	3	8	4.5
Peregrine Falcon <i>Falco peregrinus</i>	3	10	4.5
Black Falcon <i>Falco subniger</i>	3.5	10	4.5
Grey Falcon <i>Falco hypoleucos</i>	3	10	4.5
Brown Falcon <i>Falco berigora</i>	3.5	10	4.5
Australian (Nankeen) Kestrel <i>Falco cenchroides</i>	2.5	6	4

## ORDER STRIGIFORMES

### Family: Strigidae

Rufous Owl <i>Ninox rufa</i>	3	7	3
Powerful Owl <i>Ninox strenua</i>	3	8	3
Boobook Owl <i>Ninox novaeseelandiae</i>	3	6	3
Barking Owl <i>Ninox connivens</i>	3	7	3

### Family: Tytonidae

Barn Owl <i>Tyto alba</i>	3	6	3
Masked Owl <i>Tyto novaehollandiae</i>	3	7	3
Grass Owl <i>Tyto longimembris</i>	3	6	3
Sooty Owl <i>Tyto tenebricosa</i>	3	7	3

### Clause 2

### Staff

#### 2.1

Raptors shall be under the supervision of a person capable of -

- a) safely handling and/or restraining raptorial birds;
- b) minimising the likelihood of, and danger of, attacks on keepers by raptors;
- c) minimising the stress experienced by raptors;
- d) "manning" (taming) raptors before being displayed;
- e) providing adequate maintenance diets for the raptorial birds held; and
- f) recognising aberrant behaviour and indicators of ill health in the species under his/her supervision.

## 2.2

- a) If raptors are tethered on display, it shall only be for demonstration or other purposes approved by the Director-General. The tethered raptors shall be under constant supervision to protect them from the public and animal predators. Birds normally used for demonstrations may remain jessed.
- b) If raptors are to be tethered, then the person wishing to handle the birds shall first satisfy the Director-General that the person has received adequate training in the manufacture and use of the following falconry equipment:
  - Aylemerie leather jesses
  - jess swivels
  - leashes
  - gloves
  - hoods
  - perches

---

### ***Clause 3***

### ***Records***

#### **3.1 Identification**

Each raptor shall be individually identified by an approved method of identification, e.g. a leg band.

#### **3.2 Record-Keeping**

- a) Establishments shall keep records of all raptors on an individual basis in a form which can be quickly and easily examined, analysed and compared with those kept by other establishments because of the potential value for the development of improved management practices.
- b) All documents and other information pertaining to each animal from previous locations must be kept safely. Animals moving to new locations must be accompanied by copies of all records relevant to those animals.
- c) The records shall provide at least the following information for each individual:
  - i) The correct scientific name, common name, individual identification, any personal name and any distinctive markings;
  - ii) The origin (i.e. details of the wild population or of the parents and their origin, and of any previous location);
  - iii) The dates of acquisition and disposal, with details of circumstances and addresses;
  - iv) The date or estimated date of hatching, and the basis on which the date is estimated;
  - v) Clinical data, including results of physical examination by a qualified



veterinarian and details of, and date when, any form of treatment was given, together with results of routine health examinations;

- vi) Breeding and details of any offspring;
- vii) The date of death and the results of the post mortem examinations; and
- viii) Normal diet (including supplement) and feeding routine.

#### ***Clause 4***

#### ***Diet & food collection***

##### **4.1 General**

- a) Suitable whole animals shall provide at least 50% of the nutritional and energy requirements of raptors.
- b) Suitable whole animals will depend upon the species and will include -  
  
mammals such as guinea pigs (for Condors); domestic mice, rats, rabbits (for mammal-eating species); fish (for piscivorous sp.); insects (for insectivorous sp.); birds, such as coturnix quail, domestic chickens (for bird-eating species) and any natural prey species which can be legally obtained.
- c) Suitable fish species shall provide at least 25% of the dietary requirements of piscivorous raptor species.
- d) Suitable bird species shall provide at least 60% of the dietary requirements of birds of the Accipiter and Erythrotriorchis genera and bird-hunting species of the Falco genera.
- e) An establishment applying for a permit to exhibit raptors must satisfy the Director-General that it has guaranteed access to adequate fresh and/or frozen supplies of suitable whole animals.
- f) Mammal and bird specimens less than ten(10) weeks of age shall not form more than 25% by weight of the diet fed to raptors in any one week.
- g) Except on starve days, a sufficient quantity of food shall be provided daily so that there is some left over each day.
- h) Raptors may be given no more than one starve day per week and there shall be at least three(3) days between any two starve days.

##### **4.2 Quality of Food**

- a) Food supplied to raptors shall be clean and fresh, obtained from a reliable source and, preferably, bred under laboratory conditions.
- b) Before carcasses are offered as food, they shall be cut open and observed for gross lesions suggestive of disease.



- c) The following shall NOT be fed to raptors:
- \* any animal that has died, or is suspected of dying from any toxic material, including insecticides, rodenticides, and euthanasing chemicals (CO<sub>2</sub> is acceptable).
  - \* animals showing clinical signs of being infected by disease (especially trichomoniasis protozoa in pigeons and doves).
  - \* birds which have not undergone treatment to remove the risk of trichomoniasis infection. (Preferred treatment: freeze for at least 24 hours at a temperature equal to or below - 18 degrees Celsius or remove upper gastro-intestinal tract directly after euthanasia.)
  - \* laboratory mice and rats that have been used in those research programmes which lead to the food animals containing chemicals different from those of normal laboratory fed mice and rats.
  - \* fatty meat.
  - \* meat which has not been supplemented with an appropriate calcium additive.
  - \* animals which have been killed by lead shot.
- d) Food items shall be placed on a non-contaminated surface.

---

***Clause 5***

***Hygiene***

- a) Substrate of enclosures shall be cleaned at least weekly. The substrate, perches, shelves, nestboxes, food and water containers and other components of the enclosure shall be maintained in a clean and hygienic condition, free from the accumulation of faeces and urates.
- b) Excrement, left-over food, fur, feathers and castings shall be removed at least weekly to avoid unhealthy and unsightly accumulation of these matters.
- c) Contaminated substrate material shall be removed and replaced as necessary.
- d) Solid surfaces within the enclosure shall be disinfected at least bi-annually. These surfaces shall first be washed with soap and water, or steam. Disinfected surfaces shall be rinsed before raptors come in contact with them again. Use of suitable disinfectants shall be under veterinary instruction.
- e) Perches, shelves, nestboxes and other items of enclosure furniture made from wood shall be replaced after a period of no more than two(2) years. The items replaced shall be destroyed by burning.

- f) Entry of potential pests, such as wild rodents, birds and insects shall be controlled.
- g) The use in or around raptor enclosures of insecticides containing chlorinated hydrocarbons and animal poisons, e.g. rodent baits, shall be under veterinary instruction in view of the known toxicity of these substances to raptorial birds.

---

**Clause 6*****Veterinary Care***

Application for a permit to keep raptors should be accompanied by a statement which briefly explains the programme by which the veterinarian will monitor -

- \* growth of beaks and talons (to avoid bumblefoot)
- \* the level of internal parasites
- \* incidence of avian tuberculosis.

---

**Clause 7*****Transport*****7.1 Containers**

- a) A transport container for raptors shall not allow the entry of light except through ventilation holes. Ventilation holes shall be pierced around the lower half on all sides of the container, about 10cm above the internal floor height and about 7.5cm apart. Two holes shall be pierced on all four sides 10cm below the internal roof height.
- b) The dimensions of the transport container shall be at least 30cm longer and wider than the length of the bird from beak tip to tail tip and shall provide at least 15cm head clearance for the bird when standing at rest on the floor of the container or on any perch in the container.

- c) A perch consisting of a block of wood of sufficient size to allow the bird a firm grip may be firmly fixed to the floor of the container if desired.
- d) If the container includes no perch, the floor of the container shall be lined firmly with a resistant material which will provide grip for the birds' talons. (Non-looped artificial grass is recommended.)
- e) Access to the container shall be from a hinged or sliding door/lid on the top side of the container. The door/lid shall be well secured during carriage of the bird. The transport container may be constructed of sturdy cardboard, polystyrene, or wood. Use of any other material must first be approved by the Director-General.
- f) In situations where the bird will not be accompanied by an experienced raptor handler at all times during its transport, the transport container shall be constructed of wooden sheets and framing sturdy enough to withstand damage in transport. Containers must be clearly marked 'LIVE ANIMAL, HANDLE WITH CARE, THIS WAY UP, KEEP COOL'.
- g) No more than one raptor shall be enclosed in a compartment of a transport container unless all the birds in the container are young fledglings from the same nest.
- h) It is recommended that the attending veterinarian or an approved raptor rehabilitator be consulted on conditions of transportation before transporting injured or sick raptors for medical treatment or diagnosis.
- i) For journeys less than twenty-four(24) hours duration, the birds to be transported shall not be fed within four(4) hours of departure. Provision shall be made for feeding on arrival at the destination point.
- j) For journeys greater than twenty-four(24) hours, transport containers must include access to food. Birds should be fed once they have been in transit for twenty-four(24) hours.
- k) Provisions (i) and (j) do not apply to nestlings - feeding of these birds shall be under veterinary direction.
- l) Raptors must not be subjected to temperatures greater than 30 degrees or less than 10 degrees Celsius during transport.
- m) Noise must be minimised during transport.
- n) Time from boxing to destination must be minimised.

## 7.2 Release into New Enclosure

- a) Raptors that are to be released into a new enclosure (from the wild or from another enclosure/transport container) should be released at a suitable time, i.e. owls at dusk, diurnals early morning, so as to avoid heat/cold stress and allow time for orientation in a new surrounding. Release should be carried out away from public view (using screens) and separate from other birds when applicable (using partitions).
- b) Raptors may be "manned" (tamed) before being put on display.

### *Clause 8*

### *Security and public safety*

- a) Raptors shall not be enclosed in walk-through aviaries. If the Director-General is satisfied that visitors will not be attacked, exemption to this requirement may be granted.
- b) Any raptor taken from its enclosure for show or performance purposes shall have been trained to accept being tethered and shall at all times be under the control of an experienced handler. The raptor shall be belled and be fitted with jesses which have the owner's name and contact address on them.
- c) Members of the public are not permitted to handle raptors except when the birds are fully "manned" and are under the strict supervision of an experienced handler.
- d) A safety fence shall be provided to keep visitors from coming into contact with enclosures containing White-breasted Sea Eagles or Wedge-tailed Eagles.



## References

---

- Bird, D.M., Ho, S.K. 1976. Nutritive Values of Whole-Animal Diets for Captive Birds of Prey. *Raptor Research*. 10(2): 45-49.
- Brown, L. 1976. *Birds of Prey - their Biology and Ecology*. Hamlyn, London.
- Brown, L. 1976. *Eagles of the World*. David & Charles Ltd., Devon.
- Bruning, D.F. 1984. Breeding the Andean Condor (*Vultur gryphus*) at the NY Zool. Park. *International Zoo Yearbook*. No.23: 11-14.
- Cade, T.J. 1980. The Husbandry of Falcons for Return to the Wild. *International Zoo Yearbook*. No.20: 23-35.
- Cooper, J.E. 1978. *Veterinary Aspects of Captive Birds of Prey*. Standfast Press, Gloucestershire.
- Cooper, J.E. & Greenwood, A.G. (eds) 1981. Recent Advances in the Study of Raptor Diseases. *Proceedings of the International Symposium on Diseases of Birds of Prey*. Chiron Publications, Keighley, W.Yorkshire.
- Dunn, R.W. 1984. Breeding the Australian Peregrine Falcon (*Falco peregrinus macropus*) at the Royal Melbourne Zoo. *International Zoo Yearbook*. No. 23: 83-84.
- Ford, E. 1982. *Birds of Prey*. Batsford, London.
- Ford, E. 1982. *Falconry in Mews and Field*. Batsford, London.
- Fowler, M.E. (ed) 1986. *Zoos & Wild Animal Medicine*. 2nd ed. W.B.Saunders Pty Ltd., Philadelphia.
- Garcelon, D. & Bogue, G. (In press). *Raptor Care and Rehabilitation*. Alexander Lindsay Junior Museum, Calif.
- Glasier, F. 1978. *Falconry and Hawking*. Batsford, London.
- Haigh, R. 1984. The Breeding and Artificial Incubation of Hawks, Buzzards and Falcons, Accipiter, Butes and Falco spp. *International Zoo Yearbook*. No. 23: 51-58.
- Hardy, J.W. 1983. The Use of Falconry Hoods in Handling Australian Kestrels. *Corella*. 7(2): 41-43.
- Jakob-Hoff, R.M. 1988. The Husbandry and Diseases of Raptors in Australian Wildlife. The John Keep Refresher Course for Veterinarians. Post-Grad.Comm., Uni.of Sydney.
- Kirkwood, J.K. 1980. Energy and Prey Requirements of the Young Free-flying Kestrel. *Annual Report Hawk Trust*. No. 10: 12-14.
- Klapste, J. & Klapste, P. 1982. Successful Rearing of the Spotted Harrier in an Artificial



Nest. Corella. 6(2): 42-43.

McKeever, K. 1979. Care and Rehabilitation of Injured Owls. Owl Rehabilitation Research Foundation, Ontario.

Minnemann, D. & Busse, H. 1984. Longevity of Birds of Prey and Owls at East Berlin Zoo. International Zoo Yearbook. No.23: 108-110.

Olsen, J. & Olsen, P. (In press). Australian Raptors in Captivity.

Patton, K.T., Croonquist, M.J. & Crawford, W.C. 1985. Management-Related Stress in the Red-shouldered Hawk. Zoo Biology. 4(3): 235-243.

Schodde, R. & Mason, I. 1980. Nocturnal Birds of Australia. Lansdowne, Melbourne.

Schodde, R. & Tiedemann, S. (eds.) 1986. Complete Book of Australian Birds. 2nd ed. Reader's Digest, Sydney.

Slater, Peter, Slater, Pat and Slater, R. 1986. The Slater Field Guide to Australian Birds. Lansdowne - Rigby, Sydney.

Weaver, J.D. & Cade, T.J. (eds). Falcon Propagation - A Manual on Captive Breeding. The Peregrine Fund, New York.

With critiques from:

Liz Notley, Taronga Zoo Keeper  
Ron Parrish, Taronga Zoo Keeper  
David Pepper-Edwards, Taronga Zoo Keeper  
Richard Jakob-Hoff, Curator/Veterinarian, Western Plains Zoo  
Bruce Kubbere, Featherdale Wildlife Park  
Nick Mooney, Tasmanian National Parks and Wildlife Service  
Jerry and Penny Olsen, Australasian Raptor Association  
Steve Wilson, Raptor Rehabilitator.  
Philip Pain, Eagles Heritage, WA.