

**Survivorship and dispersal ability of a rehabilitated  
Brown Fish Owl (*Ketupa zeylonensis*) released more  
than a decade after admission to a wildlife rescue centre  
in Hong Kong SAR China**



**The Brown Fish Owl, Sam, in captivity at  
Kadoorie Farm and Botanic Garden**

**April 2008**

**Survivorship and dispersal ability of a rehabilitated Brown Fish Owl  
(*Ketupa zeylonensis*) released more than a decade after admission to a  
wildlife rescue centre in Hong Kong SAR China**

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## EXECUTIVE SUMMARY

A Brown Fish Owl (*Ketupa zeylonensis*) which had been maintained in captivity at Kadoorie Farm & Botanic Garden, for 11 years following its rescue, was released at a site in Sai Kung in Hong Kong on 28<sup>th</sup> November 2003.

Post-release monitoring was carried out and the bird was confirmed to have survived for at least 3 months before the radio-transmitter was dropped. The final recorded location was approximately 13 km from the release site.

This study has provided information to support the survivorship of an owl which has a restricted distribution in Southern China and also supports the decision made to release the bird, which had fully recovered during its captive care at the Kadoorie Farm & Botanic Garden, Wild Animal Rescue Centre.

With reference to the scarcity of this species in the Hong Kong SAR, the release of this male owl could have far reaching consequences regarding the viability of the local population. The study has also demonstrated that the Brown Fish Owl seems to prefer habitat which can be described as sparse woodland patches close to stream, reservoir or estuarine water.

嘉道理農場暨植物園於二零零三年十一月二十八日，在香港西貢放生一隻雄性褐魚鴉 (*Keptupa zeylonensis*)。這隻拯救得來的褐魚鴉，已於本園圈養了十一年。

放生後，根據褐魚鴉繫上的無線電發射器監察顯示，在發射器脫落前，牠存活了至少三個月。而最後的紀錄地點，跟放生地點相距約十三公里。

有關研究提供了支持這種華南地區分佈狹窄的貓頭鷹的存活資料；同時也證明了本園野生動物拯救中心放生這隻康復貓頭鷹的決定。由於這種雀鳥在本地數目稀少，放生這隻雄性褐魚鴉，會對這種貓頭鷹族群的生存力有深遠影響。這研究也顯示褐魚鴉可能偏好於河邊、水塘及河口的稀疏林地棲息。

## INTRODUCTION

Ornithologist Robert Swinhoe considered the Brown Fish Owl “pretty abundant on Hong Kong Island” in 1860 (Swinhoe, 1861). Herklots (1951) reported that owls bred at Pokfulam on Hong Kong Island. The species was considered scarce in Hong Kong (Dudgeon and Corlett, 2004) and more recently Viney *et al* (2006) described the owl as only rarely recorded but with occasional breeding records. Since 1958 the Brown Fish Owl has been recorded at only four sites, three of these in Sai Kung, and no recent records have been documented for Hong Kong Island (Carey *et al* 2001).

Knowledge of the post-release survival of rehabilitated wildlife is of critical importance to the wildlife rehabilitator (Duke *et al.*, 1981, Csermely, 2000). Passive techniques to determine post release survival such as the marking of released wildlife (bird rings, wing tags, tattoos and subcutaneous micro-chips) do provide feedback (Joys *et al.*, 2003) but for a more immediate and detailed assessment of survival, the more proactive technique of radio tracking is required.

The release of rehabilitated wildlife casualties or hand-reared orphans can make a valuable contribution to the conservation of species which exist in low numbers in the wild or have limited distribution. For example, Zuberogoitia *et al* (2003), released 64 rehabilitated Eagle Owls (*Bubo bubo*) from different wildlife rehabilitation centres around Spain at a site called Biscay in the North of Spain, 45 of which survived for more than 100 days. Three of the released birds were recorded to have bred in subsequent years, demonstrating the important role the introduced birds played in the population dynamics of the local populations. Not only did these introduced birds reinforce the population, but as they were sourced from different parts of Spain they may have contributed to the genetic diversity of the present population.

Of 66 rehabilitated Peregrine Falcons (*Falco peregrinus*) released back into the wild in the mid western United States, over 10% formed territorial pairs, contributing to the population growth of this endangered raptor (Sweeney, *et al* 1997).

To determine the survival of a given species, rehabilitated according to the methods prescribed in a specific protocol, project designers would need to ensure a statistically significant sample size, this is generally not practical. However, radio-tracking can also be used on a one-off basis to ensure that a particular animal has the capability to survive and enable the provision of support feeding or recapture if required. These individual studies may provide anecdotal information for the rehabilitators and spawn further pilot studies and research projects. Some form of evaluation or assessment of animal survival post release, may be the most useful means of justifying the resources and budget required to operate the rescue centre.

On 28<sup>th</sup> November, 2003, Kadoorie Farm and Botanic Garden (KFBG), released and radio-tracked a Brown Fish Owl (*Ketupa zeylonensis*) in Hong Kong SAR, China. The study of the survival and movements of this bird are of particular interest due to the very long time the bird was in captivity prior to release, and also because of the limited habitat available for this species in Hong Kong.

The aim of the present paper is to demonstrate the survivorship of a Brown Fish Owl that on initial appraisal might not seem to be the best subject of a release programme, due to its long history in captivity. The importance of monitoring post release survival of such cases is also highlighted.

### **History of the Owl prior to release**

The Brown Fish Owl named Sam while in captivity, was found floundering in the sea off Tai Tan in Sai Kung (North-east Hong Kong – Figure 1) on 7<sup>th</sup> January, 1992. He was taken into care by a private rehabilitator sanctioned by the Hong Kong Government. At the time the owl was thought to have had a collision with a speeding boat and was suffering concussion. On 6<sup>th</sup> June 1996 Sam was passed into the care of the Wild Animal Rescue centre at KFBG (AVID 022-055-786). Release was considered in 1996 but an eye problem and the significant period already in captivity resulted in a more cautious attitude to release. Sam remained a captive education bird until November 2003. A decision was made at this time to release Sam, based on his good condition and also considering no attempt was made to tame him during his captivity. Due to the scarcity of wild birds of this species it was also considered to be an opportunity to increase the number of potential breeding stock by releasing Sam into a known haunt for this species.

## **METHODOLOGY**

### **Tracking equipment and methods**

Following the methodology of Kenward (2001) Sam was fitted with a tail-mounted radio tag (Biotrack Ltd; Wareham, UK). The tag was a TW-3 transmitter weighing approximately 8gms with a battery life of 6 months and a signal range of up to 15km. A tail mounted tag was used as it would be shed by the bird during the annual moult and was likely to have little effect on survival, unlike back-mounted radio tags which have been shown to have a negative effect particularly regarding the survival of juvenile birds (Petty *et al.*, 2004). The tag accounted for 0.6% of Sam's body weight. It is suggested that tags should weigh less than 5% of the body weight of flying animals (Aldridge & Brigham, 1988). The Tag was attached to the base of the shaft of a central rectrix and the antenna tied and glued along the shaft at regular intervals of approximately every 3cm's (Kenward, 2001).

Following release the owl was tracked using a Biotrack, handheld, 3-element receiver. All tracking was carried out during daylight hours with the aim of finding the bird at roost. Once a location was established, a positive visual identification was attempted, with consideration to minimal disturbance to the owl. The bird was tracked every 24 hours throughout the study.

### **Release**

The Brown Fish Owl was hand released on the evening of 28<sup>th</sup> November, 2003 at Pak Tam Chung, Sai Kung, an area in which Brown Fish Owls have been previously and

recently recorded (Carey *et al.*, 2001). Pak Tam Chung provides a stream outlet to the sea and lightly wooded areas on the coastline. Also further inland are small more densely wooded areas adjacent to several villages. Historically fish owls have been observed roosting and foraging close to the stream. Pak Tam Chung also sits within the protected Sai Kung Country Park which is managed for Conservation and Recreation by Country Park wardens of the Government Agriculture, Fisheries & Conservation Department.

Prior to release Sam had been housed in an aviary measuring 10m by 3m by 4m (height) which was deemed adequate to provide basic flight practice and fitness.

## RESULTS

Radio-tracking of the released owl was carried out over approximately 129 days between 28<sup>th</sup> November 2003 and 17<sup>th</sup> April 2004 when the shed tag was discovered. It was later concluded that the transmitter had probably been dropped around 5<sup>th</sup> April 2004, as the basic location of the transmitter reading, remained the same from this point until the 17<sup>th</sup> April when it was discovered in the leaf litter within a small tract of woodland.

The last confirmed movement was on 2<sup>nd</sup> March 2004, demonstrating that Sam had survived for a minimum of 95 days after release. The largest movement recorded on a single day was 3 km.

The release took place during the dry season, with mean temperatures for November 2003 to March 2004 ranging from 14.2 to 22.2 degrees centigrade. Only trace rainfall was recorded by the Government Meteorological Office for most of the study period with increased rainfall beginning at the end of March 2004.

Locations were triangulated successfully on 119 (129 – 10) days. The location of the owl could not be determined for ten days during which time the owl was making large inland movements and extensive searches had to be undertaken before he was picked up again.

Interestingly, for much of the study period Sam roosted in patches of woodland close to small rural villages and with an adjacent stream and fairly disturbed habitat, including grassland and shrubland. Unfortunately, it was not possible to retrieve any pellets below roosts, so we cannot confirm the dietary composition during the study period.

Movement details of the Brown Fish Owl during the survey are illustrated in Table 1 and on Figure 2.

## DISCUSSION

The present study has shown that the Brown Fish Owl, after a period of eleven years in captivity was successfully released and is known to have survived over 3 months post release. Martell *et al* (2000) considered 6 weeks to be the critical time period to demonstrate post release survival success. Sam was seen at roost on several occasions

during the study and took flight at least once when approached too closely, the natural behaviour of a wild bird. Flight was strong and general condition was good when observed from close proximity.

The locations where Sam was recorded suggest that he may have been taking advantage of the rodent populations associated with the local villages and may also have been hunting along the streams and river outlets to the sea. All roosting sites were within a short flying distance to a stream or reservoir or the sea. Because pellets were not retrieved and no observations were made of Sam hunting we cannot conclude what he may have been eating during the study period.

This study has illustrated the value of release of a rehabilitated bird which is known to be naturally scarce in Hong Kong and South China. Adding an adult male bird to the diminished wild population might have a significant affect on the breeding opportunities for this species. Furthermore, the extended period in captivity does not appear to have been detrimental to the bird's survival post release.

The transmitter which was attached to a tail feather worked successfully and remained attached for a period of more than 3 months.

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### **REFERENCES**

Aldridge, H.D.J.N., and Brigham, R.M. 1988. Load carrying and manoeuvrability in an insectivorous bat: a test of the 5% 'rule' of radio-telemetry. *Journal of Mammalogy* 69: 379-382.

Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Young, L. 2001. *The Avifauna of Hong Kong*. Hong Kong Bird Watching Society, Hong Kong.

Csermely, D. 2000. Rehabilitation of birds of prey and their survival after release. A review. In: Lumeij J.T., Remple D., Redig P.T., Lierz, M. and Cooper J.E. (eds) *Raptor Biomedicine III, Including Bibliography of Diseases of Birds of Prey* pp303-311. Zoological Education Network: Lake Worth, Florida.

Dudgeon, D. and Corlett, R. 2004. *Ecology and Biodiversity of Hong Kong*. Friends of the Country Parks, Hong Kong.



Duke, G.E., Redig P.T. and Jones W. 1981. Recoveries and re-sightings of released rehabilitated raptors. *Journal of Raptor Research* 15: 97-104.

Herklots, G.A.C. 1951. The Hong Kong Countryside. *Hong Kong South China Morning Post*.

Joys, A.C., Clark J.A., Clark N.A. and Robinson R.A. 2003. An investigation of the effectiveness of rehabilitation of birds as shown by ringing recoveries. BTO Research Report No. 324, British Trust for Ornithology, Thetford, UK.

Kenward, R.E. 2001. *A Manual for Wildlife Radio Tagging*. Academic Press: London, UK.

Martell, M.S., Groggin, J. and Redig, P.T. 2000. Assessing rehabilitation success of raptors through band returns. In: Lumeij J.T., Remple J.D., Redig P.T., Lierz M. and Cooper J.E. (eds) *Raptor Biomedicine III*. Zoological Education Network: Lake Worth, Florida.

Petty, S.J, Appleby B.M., Coles C.F. and Julliard R. 2004. The long-term effect of fitting back-mounted radio tags to juvenile Tawny Owls *Strix aluco*. *Wildlife Biology* 10: 161-170.

Sweeney, S.J, Redig P.T., and Tordoff H.B. 1997. Morbidity, survival and productivity of rehabilitated peregrine falcons in the upper Midwestern United States. *Journal of Raptor Research* 31: 347-352.

Swinhoe, R. 1861. Notes on the ornithology of Hong Kong, Macao, and Canton, made during the latter end of February, March, April and beginning of May 1860. *Ibis* 1861: 23-57.

Viney, C., Phillips, K. and Lam, C.Y. 1994. *Birds of Hong Kong*. 6<sup>th</sup> Edition. Hong Kong Government Printer, Hong Kong.

Zuberogitia, I., Torres, J.J., and Martinez J.A. 2003. Reforzamiento poblacional del Búho Real, *Bubo bubo*, en Bizkaia (Espa\*a). *Ardeola* 50: 237-244.

**Table 1. Movement of the Brown Fish Owl post-release**

<b>Position on map</b>	<b>Date at position</b>
1	28/11/03 to 30/11/03
2	1/12/03 to 2/12/03
3	3/12/03 to 4/12/03
4	5/12/03 to 9/12/03
5	10/12/03
6	11/12/03
7	13/12/03 to 15/12/03
8	16/12/03 to 17/12/03
9	20/12/03 to 24/12/03
10	25/12/03
11	30/12/03
12	31/12/03
13	1/1/04 to 6/2/04
14	9/2/04 to 28/2/04
15	2/3/04 to 5/4/04

Figure 1. The locality of release in Hong Kong.



Figure 2. Sequence of movements undertaken after release.

