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An Analysis of Raptor Injuries Treated in the Australian Capital Territory District 1976-80

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Records over five years of raptors treated in captivity are analysed. Ailments, seasonality of injury and rehabilitation success are examined. The paper highlights the benefits of detailed record keeping.

Between 1976 and 1980, 90 invalid raptors of 12 species, mostly from the A.C.T. District, were treated in Canberra by Mike Hinchey (MH), Penny and Jerry Olsen (PJO), Russell Cameron (RC), Sally Thompson (ST), Dianne Beatty (DB), Jan Spate (JS), Elizabeth Raymond (ER) and Neil Hermes (NH), all of whom have kindly provided the details for this analysis.

In many instances, the initial notification of finding an injured bird was to the Wildlife Foundation (A.C.T.) Incorporated, a non-profit organisation set up solely to promote the well being and care of wildlife. Individuals of the Foundation who have the expertise, willingness and facilities attempt to nurse animals back to health. They operate under authority from the Conservation and Agriculture Branch of the Department of the Capital Territory, and with the co-operation of the Royal Society for the Protection and Care of Animals (RSPCA).

The Olsens are not connected with the Foundation and only receive from them birds that cannot be released. All birds are held by them under licence and are used for research whether they be retained or destroyed (e.g. Olsen and Olsen 1980a and 1980b).

Analysis

The details of all raptors are given in the Appendix.* The 90 raptors examined probably

represent most of those treated in the four years 1976-1980. Of the 33 individuals for which a sex was recorded 19 were males and 14 females.

When this paper was finalised in April 1981, 56% of those considered had been successfully rehabilitated and released, 2% escaped, 27% died or were destroyed, 12.5% were being retained and were possibly unreleasable but were being used in research, and the fate of one was unknown.

At least 43% of the birds suffered injuries attributable to human activities (Table 1). The predominant wounds were wing injuries — 49% of individuals (Table 2) — with internal injuries including concussion in 19%. Birds which had flown into windows were rehabilitated most successfully (Table 1).

Birds were received in all months of the year but numbers were few. However, 85% of the Australian Kestrels were received from May to November and all 11 Barn Owls between June-October. A seasonal trend may emerge with further data.

* Scientific names of all species referred to in the text are listed in Appendix.

Discussion

In a global review Newton (1979) mentioned many of the causes of raptor mishap and mortality such as starvation, disease, predation, electrocution, shooting, trapping, poisoning, collisions and other accidents but, as he says, "... in any one population it is hard to tell the relative importance of each cause". An additional factor in analysing the effects on the population is that when the data are obtained from rehabilitation programmes and recoveries of banded birds, they "... are inevitably biased towards mortality associated with human activity and habitation" (*loc. cit.*).

In Australia, comparative studies of the causes of raptor injury and mortality are few. Hollands (1971) reported road-killed owls. In a two-year survey of traffic kills along a 301 km route in south-eastern New South Wales Vestjens (1973) found 55 raptors of six species of which 58% were Barn or Boobook Owls. Schodde and Mason (1981) stated the Boobook and Barn Owls are often hit by cars. Olsen and Olsen (1980b) examined the impact of human disturbance on breeding Peregrine Falcon in Australia and reported that:

"Three of six injured Peregrine Falcons and all five injured Australian Hobbies ... brought to (them) appeared to have or were reported to have struck wires". Emison and Bren (1981)

reported that of 12 recoveries from 212 banded Peregrine Falcon chicks, three were hit by cars, two shot and one hit a wire. Such findings are commonplace among raptors (Newton 1979). Mooney (1981) summarised a treatment programme for injured raptors in Tasmania where 60% were successfully rehabilitated.

A considerable number of the injuries (42%) were man-related (Table 1) and of these 64% were due to road, power line and window strikes. Gunshot injuries were probably higher because often they are not apparent clinically. Snelling (1975) determined the presence of gunshot by radiograph analysis, a useful technique not used in this survey. Banks (1979) examined human-related mortality of all birds in the United States of America, and reported that hunting was the largest direct mortality factor, accounting for 61% of deaths, collision with man-made objects 32% and pollution or poisoning 2%.

In Snelling's (1975) survey there was a marked increase in the number of birds received in late autumn and winter, a rise paralleled by the owls in this survey. The reports of thin and weak Barn Owls indicate that they are then showing the effects of a scarce winter prey population. Many of those reported may have been inexperienced predators and/or immature birds. Similarly the larger number of kestrels in

TABLE 1

Causes of raptor injuries — actual and suspected.
(Figures represent the number of individuals treated/number released)

Species	Trapped or held Captive	Poisoned	Shot	Cat Mauled	Road Strike	Power Line Strike	Window Strike	Unknown or Other
Black-shouldered Kite	1/1?							2
Whistling Kite			1					
Brown Goshawk	1							3
Collared Sparrowhawk								3
Wedge-tailed Eagle	1		1					3
Little Eagle	1	1/1						
Peregrine Falcon					1			1
Australian Hobby						1		4
Brown Falcon	1/1				3/2			5
Australian Kestrel	3/1		2/1	1	7/4	1/1	2/2	17
Southern Boobook					2/1		3/3	7
Barn Owl					1/1		4/3	6
Total	8/3?	1/1	4/1	1	14/8	2/1	9/8	51

TABLE 2

Type of ailment of treated raptors.
All ailments of each bird are recorded in appropriate columns.
(Number released in brackets)

Species	Disability							
	Nestling (not independent)	Thin or Weak	Internal injury	Wing	Visible injury of			Unknown
Eyes/ Beak/ Head					Tail	Legs/ Pelvis		
Black-shouldered Kite	1(?)		1(1)	1				
Whistling Kite				1				
Brown Goshawk			1	3(2)	2(1)	1		
Collared Sparrowhawk				2(2)			1(1)	
Wedge-tailed Eagle				4(1)			2(1)	
Little Eagle			1(1)	1				
Peregrine Falcon				1				1
Australian Hobby			1	4			1	
Brown Falcon	3(3)		2(1)	3(1)	1		1(1)	
Australian Kestrel	2(1)	5(3)	6(3)	24(14)	1		4(3)	
Southern Boobook	2(1)	1(1)	3(3)		2(2)		3(2)	2(2)
Barn Owl		5(5)	2(1)		3(1)	1		3(3)
TOTAL	8(5?)	11(9)	17(10)	44(20)	9(4)	2	12(8)	6(5)

summer and autumn may reflect the greater vulnerability of immature birds which are probably more common in those months.

The density of raptors is usually lower than most other birds in a habitat and the status of their populations could be more seriously effected by human-related mishaps causing injury or death (Olsen and Olsen 1980b). This type of survey provides a useful index of the extent of such mishaps and highlights the importance of keeping detailed records of the bird, its injury and the treatment.

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APPENDIX

Details of raptors treated in the A.C.T. District 1976-1980.
(Initials of Reporters identified in text)

Species	Date Received (Reporter)	Age	Sex	Diagnosis and Notes	Fate
Black-shouldered Kite <i>Elanus notatus</i>	1 June 76 (PJO)	Immature		About 3 weeks old. Taken from nest, primaries clipped and kept in budgie cage.	Unknown
	20 July 76 (PJO)	Adult		Found at Government House Agistment Paddock on ground. Slight concussion, one wing hanging a bit.	Released 26 Aug. 76 Banded*
	15 Aug. 79 (MH)			From Belconnen, ACT. Left wing almost severed. Amputated.	Destroyed
Whistling Kite <i>Haliastur sphenurus</i>	May 76 (PJO)		(male?)	Shot in western NSW, injured wing amputated, kept in Canberra backyard for some time. Handed in with many broken feathers and blocked nares.	Retained
Brown Goshawk <i>Accipiter fasciatus</i>	18 Apr. 78 (PJO)	Immature	male	From Woden, ACT. Broken wing.	Released Banded
	18 Nov. 78 (MH)	Immature		From RSPCA, Queanbeyan, NSW. Flesh wound above beak, above left eye and at top of right wing. All tail feathers broken. Tail feathers removed. Escaped after two days.	Escaped
	12 Dec. 78 (RC)			From Yass, NSW. Concussion.	Died
	March 80 (PJO)	Juvenile	female	From RSPCA. Broken wing. Cere bashed in.	Released 5 May 80
Collared Sparrowhawk <i>Accipiter cirrhocephalus</i>	5 July 76 (PJO)	Adult	male	Found under bush in Campbell, ACT, with broken wing.	Released 15 Mar. 78 Banded
	Dec. 79 (JS)	Young		From Hall, ACT. Broken wing.	Released
	Dec. 79 (JS)	Young		Damaged leg and pelvis.	Released
Wedge-tailed Eagle <i>Aquila audax</i>	1976 (PJO)		male	From Tidbinbilla Reserve. Blind right eye, broken right wing hanging — both old injuries.	Retained
	30 July 77 (PJO)		male	Found beside road. Broken wing already healed badly.	Destroyed (eyes used in optics research)
	1 Mar. 79 (MH)	Adult		From Wanniasa, ACT. Bullet hole through outer bone of metacarpals on right wing. No tendon damage. Bone shattered with piece missing. Pinned, cleaned and stitched, interfered with three times by bird.	Destroyed
	19 June 79 (PJO)		male	From Burrinjuck Dam, NSW. Appeared to have been caught in rabbit trap — partial loss of use of left. Failed to regain use of legs.	Destroyed (eyes used in optics research)

Wedge-tailed Eagle cont.

	13 Aug. 79 (PJO)		female(?)	From Captain's Flat, NSW. Seen in paddock for several weeks on ground. Broken tarsus and most primaries broken on left wing. Regained full use of leg. Moulting before release.	Released Banded
Little Eagle <i>Hieraetus morphnoides</i>	12 July 79 (RC)			From Hall, ACT. Poisoned.	Released 19 July 79
	March 80 (PJO)		female	From RSPCA. Found on window ledge. Had apparently been a captive. Old, poorly healed, broken wing. All primaries broken, wrist and knees rubbed raw. Retained but beginning to fly well, possibly releasable after moult.	Retained
Peregrine Falcon <i>Falco peregrinus</i>	June 79 (JS)	Adult		Hit by car.	Died
	Nov. 80 (JS)	Young		Found with a broken wing.	Escaped
Australian Hobby <i>Falco longipennis</i>	18 Dec. 78 (MH)	Adult	male	Superficial cut on left wing near ulna. Green flesh to near base of humerus.	Retained
	23 Jan. 79 (PJO)	Adult	female	Found on ground below power lines. Broken humerus and wrist joint.	Retained
	2 Apr. 79 (MH)	Adult		From Fyshwick, ACT. Broken right humerus. Pinned. Weak on 5 April from shock, loss of blood.	Died 5 Apr. 79
	4 Mar. 80 (PJO)	Juvenile	male	Concussion and broken wing.	Retained
	June 80 (RC)			Received from RSPCA. Bumble foot.	Retained
Brown Falcon <i>Falco berigora</i>	12 June 79 (MH)		male	From RSPCA. Dislocated and erupted humerus/radius, ulna broken. Stitched and splintered. Healed badly.	Died
	18 Sept. 79 (MH)	Adult		From RSPCA (Farrer, ACT). Humanised, falconry jesses on legs.	Released Oct. 79
	10 Oct. 79 (RC)			From Yass, NSW. Car hit. Broken wing and leg.	Released 20 Dec. 79
	7 Nov. 79 (RC)			From Bega, NSW. Very quiet. Post mortem revealed fungus on lungs.	Died 15 Nov. 79
	4 Dec. 79 (RC)			From Cooma Road, ACT. Broken wing, exploded eye. Car strike?	Destroyed
	4 Dec. 79 (RC)			From Bruce, ACT. Nestling.	Released 12 Jan. 79
	5 Dec. 79 (RC)			From Bruce, ACT. Nestling.	Released 30 Dec. 79
	17 Feb. 80 (RC)			From Civic, ACT. Concussion from car strike.	Released 20 Feb. 80
	Nov. 80 (PJO)	Nestling	male	Approximately 4 weeks old; probably blown from nest.	Released
Australian Kestrel <i>Falco cenchroides</i>	8 Mar. 76 (PJO)	Adult?	female	From Fyshwick, ACT. Found beside road, appeared concussed.	Released Banded 29 Mar. 76
	7 Apr. 76 (PJO)		female	Hit by car at Marulan, NSW. Concussed for several days, 9 rectrices broken and outer primaries on one wing. Retained until moult finished. Produced three young in captivity.	Released Banded 27 Aug. 77

Australian Kestrel cont.

May 76 (PJO)		female	Found at Queanbeyan, NSW, by side of road. Lump on head and right wing hanging. Permanent damage to nervous system (balance, etc.). Produced 4 eggs.	Died
30 June 76 (PJO)		female	From Russell Offices, ACT. Suspect hit window. Broken wing. Wing pinned.	Released Banded 30 Oct. 76
1 Dec. 76 (PJO)	Adult	male	Found with injured wing at Narrabundah, ACT. Kept in box with bird seed several days. Flesh rotting, wing amputated.	Retained
8 Dec. 76 (PJO)	Adult	male	Shot through wrist. Bred in captivity.	Retained
Jan. 78 (PJO)		female	Found on road at Sutton, NSW. Runt, suspected pituitary impairment.	Destroyed 30 Oct. 78
18 Sept. 78 (PJO)		female	Found near Hall, ACT. Wing injury, partly healed, thin.	Released Banded 19 Dec. 78
22 Nov. 78 (MH)		female	From Monaro Highway, near Canberra. Broken humerus, right wing. Bound to body. Seemed set 3 Dec.	Died 15 Dec. 78
12 Dec. 78 (MH)		male	From Macgregor, ACT. Dislocated/torn radius-humerus joint in left wing. Internal injuries?	Died 14 Dec. 78
18 Jan. 79 (MH)		male	Left humerus torn from shoulder. Major tendon damage. Tendon sown and some use of wing returned.	Released 26 Mar. 79
19 Feb. 79 (RC)			From Rivett, ACT. Claw injury.	Released 24 Feb. 79
12 Mar. 79 (MH)	Adult	male	From Tharwa, ACT. Dislocated right shoulder and severe wing bruising. Manipulated back into place 4 April: scar tissue around shoulder dissipating.	Released 17 Apr. 79
21 May 79 (MH)	Adult	male	From Kaleen, ACT. Cat mauling — small chest hole, emaciated, old metacarpals injury on left wing.	Died 23 May 79
23 May 79 (MH)	Adult	male	From Fyshwick, ACT. Broken radial-ulna joint with humerus. Shattered knuckle.	Destroyed 24 May 79
10 Aug. 79 (PJO)			Broken wing, badly healed. Produced young in captivity.	Released Banded
6 Sept. 79 (MH)	Adult	male	From Lyons, ACT. Retarded development from poor diet. All primaries and tail feathers clipped, diarrhoea.	Died 5 Oct. 79
10 Nov. 79 (MH)	Adult	male	From Murrumbateman, NSW. Old break of right radius/ulna. Emaciated. Lice. Strapped wing, removed strap 5 Dec.	Released 28 Dec. 79
14 Nov. 79 (RC)			From Coppins Crossing, ACT. Broken wing.	Retained
14 Nov. 79 (RC)			From Coppins Crossing, ACT. Broken wing. Airgun pellets.	Released 18 Feb. 80
27 Nov. 79 (RC)			From Fyshwick, ACT. Broken wing and leg. Car strike.	Released 16 Dec. 79
Dec. 79 (RC)			From O'Connor, ACT. Broken wing with gangrene.	Destroyed
10 Dec. 79 (RC)			From Captain's Flat, NSW. Broken wing.	Released 3 Mar. 80

Australian Kestrel cont.

10 Dec. 79 (RC)			From Belconnen, ACT. Exhausted. Put on antibiotics.	Released 22 Dec. 79
10 Dec. 79 (MH)	Young		From Russell, ACT. In partly downy plumage. Flew into window.	Released 28 Dec. 79
14 Jan. 80 (PJO)	Young	female	Found on ground, thin and weak.	Released Banded 5 Feb. 80
8 Feb. 80 (RC)			From Bungendore, NSW. Broken wing, possibly hit power line.	Released 22 Dec. 80
11 Mar. 80 (RC)			From Kambah, ACT. Broken legs, possible car strike.	Released 24 Mar. 80
1 Apr. 80 (RC)			From University, ACT. Broken wings and feet.	Destroyed
Apr. 80 (ER)			From ACT. Looked ill, lice, ruffled feathers.	Released "after 3 weeks"
Apr. 80 (PJO)		female	From RSPCA. Broken wing.	Released Banded
11 Apr. 80 (RC)			From RSPCA. Broken wing.	Released 5 May 80
June 80 (RC)			From Belconnen, ACT. Broken wing.	Retained

Southern Boobook

<i>Ninox novaeseelandiae</i>	3 Jan. 78 (PJO)	Nestling		Found on ground at Watson, ACT. Not fully feathered.	Released Banded 26 Mar. 78
	24 July 78 (PJO)			Found Mawson Shops, ACT. Concussed, scratched cornea on right eye.	Released Banded
	2 Mar. 79 (MH)	Adult		From Hawker, ACT. Stunned after flying into window. No apparent injury.	Released 3 Mar. 79
	2 Mar. 79 (MH)	Adult		From Hackett, ACT. Limited use of right talons. 5 Mar: hip manipulated to correct position. Force fed. 8 Mar: talons clubbed but relax with forced exercise. 11 Mar: ate voluntarily, opened both claws to perch.	Released 23 Mar. 79
	15 Mar. 79 (MH)	Adult		From Chapman, ACT. Car strike. Very weak and unaggressive. Torn talon on right foot.	Released 26 Mar. 79
	20 May 79 (MH)	Adult		Broken left tibia, close to lower joint. Aligned, tightly bound and splined. Walking by 6 June. Eating 2 mice per day. Legs not improved.	Died 6 Sept. 79
	8 June 79 (MH)	Adult		From Melba, ACT. No apparent injury. Given food and rest.	Released 21 June 79
	6 June 79 (MH)	Adult		From Giralang, ACT. No apparent injury. Ate readily.	Released 11 July 79
	Sept. 79 (JS)	Nestling		From Woden, ACT.	Released
	25 Jan. 80 (ST)	Juvenile	female(?)	From Campbell, ACT. Did not fly. Fed live mice. Partially blind — later progress to completely so. Injected initially with cortico-steroid and later given dead mice injected with Vit. A for 10 days. Fed by resting prey on feet. Recognises voice and usually reaches immediately for food. No difficulty in positioning food and tearing apart.	Retained

Southern Boobook cont.

	June 80 (DB)		From Belconnen, ACT. Road hit.	Died
	6 June 80 (ST)		From Turner School, ACT. Concussion, one eye not dilating, head trembling, fat and not eating. Force fed 9 June, later ate well and trembling gradually disappeared.	Released Turner School 24 June 80
Barn Owl <i>Tyto alba</i>	13 Sept. 76 (NH)	Adult	From University. Being chased by magpies, flew into window. Weak (wt. 452 g). Grease on feathers removed.	Released
	6 June 80 (ST)		From Campbell, ACT. Ulcer on eye, ate many mice and rats.	Released
	28 July 80 (ST)		Thin, no apparent injury, not eating. Ate 29 July.	Released 31 July 80
	3 Aug. 80 (ST)	Two Birds	From Wanniasa, ACT. Both being chased by birds, one had bad shock and head wound, other had no apparent damage.	1. Died 6 Aug. 2. Released 15 Aug. 80
	12 Aug. 80 (ST)		Attacked by birds, concussion and one eye lost, treated Chloram B.	Died 15 Aug. 80
	5 Sept. 80 (ST)		From fields near Hawker, ACT. Being attacked by magpies, injured at base of tail. Ate 7 Sept.	Died 8 Sept. 80
	26 Sept. 80 (ST)		From RSPCA. Very thin and weak, force fed, later ate well.	Released 30 Oct. 80
	29 Sept. 80 (ST)		From Woden, ACT. Flew into window and broke glass, drooping wing, no apparent injury. Plump, ate well.	Released 6 Oct. 80
	2 Oct. 80 (ST)		From Stirling College, ACT. Concussion, not perching, looked very poor. Force fed on 4 Oct., later ate well.	Released 16 Oct. 80
	7 Oct. 80 (ST)		From Tuross Heads, NSW. Car strike on 4 Oct. Thought "cute" by finder and queried if it could be kept. Handed in, lively.	Released 10 Oct. 80

* Bands used were provided by the Australian Bird-banding Scheme, Division of Wildlife Research, CSIRO.