The Health of the Helmeted Honeyeater *(Lichenostomus melanops cassidix)*

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The Helmeted Honeyeater, (*Lichenostomus melanops cassidix*), one of four subspecies of the Yellow-tufted Honeyeater *(Lichenostomus melanops gippslandicus*), is classified as critically endangered. Wild birds occur only in a few kilometres of streamside swamp forest in Yellingbo Nature Conservation Reserve and at Tonimbuk in Bunyip State Park where a small r`e-introduced population has been established. The Helmeted Honeyeater has been the subject of an intensive recovery program since 1989. There are currently about 60 birds in the wild at Yellingbo, 25 wild birds at Tonimbuk, a captive population of 29 adults at Healesville Sanctuary and 4 at Taronga Zoo.

The Helmeted Honeyeater has been Victoria's state bird emblem since 1971. Since the recovery effort to save the species began, a number of threats to the species survival have been documented. Since Healesville Sanctuary's involvement in the captive breeding and management of the species in 1989, significant knowledge has been gained, including veterinary findings. Despite this involvement there are a number of key health parameters of Helmeted Honeyeaters that have not to date been described. This study fills this gap in knowledge and given the critically endangered status of this high profile species, it is well overdue research.

Over a 14-month period, 48 Helmeted Honeyeaters (*Lichenostomus melanops cassidix*) and four Yellow-tufted Honeyeaters (*Lichemostomus melanops gippslandicus*) had routine health checks performed on them at Healesville Sanctuary. These birds comprised part of the captive breeding program at Healesville Sanctuary, birds intended for re-introduction to Yellingbo and Tonimbuk and wild birds from these two locations. A number of clinical parameters were examined for their possible influence on health and success of re-introduction.

Reference intervals were established for biochemistry and descriptive work on haematology was completed. A new Isospora species was described in Helmeted Honeyeaters after the measurement of thirty-one oocysts. The same new species was identified in Yellow-tufted Honeyeaters. This protozoan parasite was considered benign. Ectoparasites were not pathogenic. A new species of *Ornithomya* (Hippoboscidae – flat fly) was described. A new species of *Neodectes* (Proctophyllodidae - feather mite) was described. DNA sequencing of ticks will be necessary for their identification.

In May 2005 eight Helmeted Honeyeaters were re-introduced to Tonimbuk. It was possible to re-examine the health of five of these birds post release. Body weights were recorded and 0.25 ml of blood was collected for biochemistry and haematology studies. The presence of ectoparasites was assessed and faecal flotations performed to check the presence of endoparasites.

In January 2006 seven birds were re-introduced to Yellingbo and in February 2006 seven birds were re-introduced to Tonimbuk. In April 2006 a further six birds were re-introduced to Yellingbo and it was possible to re-examine the health of four of these birds post release.

Results showed increases in Glucose, Total Protein and Albumin in the re-introduced birds were statistically significant. This suggested the released birds may have a better state of health in the wild compared to their previous state of health in captivity. An analysis of nutritional influences, comparing the wild diet, also supplemented daily with Wombaroo nectar, to the captive diet were made. Recommendations to improve the nutritional benefits of Helmeted Honeyeaters, particularly during the breeding season in the captive program at Healesville Sanctuary were made. This involved increasing the insectivorous component of the diet between July and February, which allows extra protein requirements necessary at this time to be met.

A summary of important mortalities of Helmeted Honeyeaters during the seventeen years of the recovery program was included.

Table: Summary of Helmeted Honeyeater Mortalities

Aspergillus	13 %
Vitamin D Toxicity	20 %
Thiamine Deficiency	14 %
Allergic Stomatitis	2.5 %
Trauma	15 %
Predation	5.6 %
Mismothering	8 %
Eggs Failed to Hatch	7 %
Egg Peritonitis	2.5 %
Drowning	2.5 %
Coccidia	1 %
Aspiration	1 %
Enteritis	1 %
Leb Band Trauma	1 %
Other	5.9 %

In this analysis a complete review of Helmeted Honeyeater health was conducted and descriptions of identified pathological entities made.

Table - Reference Values Established for Helmeted Honeyeaters (*Lichenostomus melanops cassidix)*

Value	*Mean ±SD	Median, range
PCV %	52.93 ± 6.81	54 , 42 - 68
CK U/L	1622.0 ± 1452.85	1178, 0 - 6212
Glu mmol/L	16.49 ± 4.83	16.35, 7.1 – 31.4
TP G/L	27.52 ± 3.25	28, 20 - 34
Alb G/L	26.15 ± 3.28	26, 19 - 34
Glob G/L	0 ± 0	0, 0 - 0
UA µmol/L	597.97 ± 182.42	589, 179 - 1044
BUN mmol/L	1.15 ± 0.54	1, 0 - 3
Bile Acids umol/L	13.73 ± 10.29	11, 0 - 38
Phos mmol/L	0.46 ± 0.40	0.4, 0 – 1.6
Ca mmol/L	2.129 ± 0.129	2.11, 1.92 – 2.57
Na mmol/L	155.54 ± 4.75	155.5, 142 - 165
K mmol/L	2.80 ± 0.77	2.6, 1.4 – 4.7
AST U/L	577.52 ± 321.1	499, 29 - 1759