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**Conservation issues for Hochstetter's frog (*Leiopelma hochstetteri*):
Monitoring techniques and chytridiomycosis prevalence in the
Auckland Region, New Zealand.**

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Abstract

Amphibians are suffering extinctions and range contractions globally. This is caused by numerous factors and most of them are related to human activities. The overall aim of this thesis was to make a significant contribution to the conservation of the endemic amphibian *Leiopelma hochstetteri* through research. This was achieved by focusing in two of the main conservation issues for this species, the need for standardised and robust monitoring techniques to detect trends and changes in populations, and the determination of the prevalence of chytridiomycosis, caused by the amphibian chytrid fungus (*Batrachochytrium dendrobatidis*). Two populations of the Auckland Region were selected for this study, one on the mainland (Waitakere Ranges) and the only known offshore island population of this species (Great Barrier Island). For both study sites different monitoring methods were used to obtain some population parameters. Site occupancy models of MacKenzie et al. (2002) gave reliable site-specific estimations of *occupancy* and *detection probability* using covariate information and presence-absence data collected from 50 sites in the Waitakere Ranges and four repeated visits during 2008. Elevation and distance searched were found to have an important effect on occupancy levels, while time taken to search the site was important variable determining detection probabilities. Also, parameters were estimated for three age classes separately. Statistical models were used to infer abundance from occupancy analysis, and results were compared with the distribution of relative abundances obtained from repeated transect counts and an established sight/re-sight criterion. In addition, the use of surrogate measures for relative abundance was explored. Detection probability and the distance to first frog found were found to have a significant correlation with relative abundance. These measures can be used to infer relative abundance in future site occupancy surveys. Two surveys and a pilot site occupancy survey were conducted on Great Barrier Island, and presence of frogs was confirmed at the northern block, and in a small seepage in the central block. No new locations were found. Waitakere Ranges and Great Barrier Is. populations were tested for the presence of chytridiomycosis, and all frogs sampled tested negative ($n = 124$) which means that if present chytridiomycosis prevalence is lower than 5% with a 95% confidence interval. This and previous evidence suggests that *L. hochstetteri* may be resistant or immune to the disease. However, to confirm this additional studies are needed.

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Table of Contents

Abstract.....	ii
Acknowledgements.....	iii
List of Plates.....	vii
List of Figures.....	viii
List of Tables.....	x
CHAPTER 1 General Introduction.....	1
1.1 Background	2
1.1.1 Amphibians	2
1.1.2 Declining Amphibian Populations.....	3
1.1.3 Amphibian Conservation.....	4
1.1.4 New Zealand amphibians	6
1.1.5 Hochstetter's frog	9
1.1.6 Conservation of Hochstetter's frog	11
1.2 Thesis Aims and structure.....	13
1.3 References	15
CHAPTER 2 Occupancy and relative abundance of <i>Leiopelma hochstetteri</i> in the Waitakere Ranges, Auckland Region, New Zealand	15
2.1 Abstract.....	20
2.2 Introduction	21
2.2.1 Monitoring native frogs	21
2.2.2 Site occupancy modelling.....	22
2.2.3 Abundance models.....	24
2.3 Objectives.....	25
2.4 Methods	26
2.4.1 Study Area: The Waitakere Ranges.....	26
2.4.2 Site selection	27
2.4.3 Field methods.....	29
2.4.4 Data Analysis	31
2.4.5 Statistical methods.....	32
2.5 Results.....	38
2.5.1 Site occupancy modelling, MacKenzie et al. (2002)	38
2.5.2 Covariates	38
2.5.3 Relative abundance.....	43
2.5.4 Abundance models.....	47

2.5.5	Surrogate measures for relative abundance.....	50
2.5.6	Comparison of techniques.....	52
2.6	Discussion.....	54
2.6.1	Site occupancy modelling.....	54
2.6.2	Relative abundance estimation by repeated transect counts and sight-re-sight criteria.....	60
2.6.3	Abundance models.....	61
2.6.4	Surrogate measures.....	62
2.6.5	Overall comparison of monitoring techniques.....	62
2.6.6	Comparison with previous studies.....	63
2.7	Recommendations.....	66
2.8	References.....	67
CHAPTER 3 A survey for Hochstetter's frog (<i>Leiopelma hochstetteri</i>) on		
Great Barrier Island.....		71
3.1	Abstract.....	72
3.2	Introduction.....	73
3.2.1	Great Barrier Island.....	73
3.2.2	Hochstetter's frog on Great Barrier Island.....	75
3.3	Objectives.....	76
3.3.1	First survey (January 2008).....	76
3.3.2	Second survey (March 2009).....	76
3.4	Methods.....	76
3.4.1	First survey (January 2008).....	76
3.4.2	Second survey (March 2009).....	79
3.5	Results.....	81
3.5.1	First survey: January 2008.....	81
3.5.2	Second survey: March 2009.....	81
3.5.3	Population structure.....	85
3.6	Discussion.....	85
3.7	Recommendations.....	88
3.8	References.....	89
CHAPTER 4 Chytridiomycosis prevalence in the Waitakere Ranges and Great		
Barrier Island, Auckland Region, New Zealand.....		90
4.1	Abstract.....	91
4.2	Introduction.....	92
4.2.1	Chytridiomycosis.....	92

4.2.2	Bd impact on amphibian populations.....	93
4.2.3	Diagnosis	93
4.2.4	Cure.....	94
4.2.5	Bd in New Zealand.....	94
4.3	Objective.....	95
4.4	Methods	95
4.4.1	Sample collection.....	95
4.4.2	Swabbing protocol	96
4.4.3	Testing.....	96
4.5	Results.....	97
4.6	Discussion	97
4.7	Recommendations:	98
4.8	References	99
CHAPTER 5	General Conclusion	103
5.1	Introduction.....	104
5.2	General conclusions and future research directions	104
5.3	References	109
Appendix I.	Survey data sheet.....	111
Appendix II.	Locations of Waitakere Ranges sites.....	112
Appendix III.	Waitakere Ranges site descriptions and observations.....	115
Appendix IV.	List of frogs found in the Waitakere Ranges.....	125
Appendix V.	Relative abundance of frogs in Waitakere Ranges sites.....	138
Appendix VI.	Comparison of relative abundance of Waitakere Ranges sites with previous surveys.....	140
Appendix VII.	Location and description of Miners Cove sites.....	142
Appendix VIII.	Location of swab samples.....	144

List of Plates

Plate 1. Hochstetter's frog (<i>Leiopelma hochstetteri</i>)	1
Plate 2. Typical Hochstetter's frog habitat (<i>Photo</i> : Claudio Aguayo).....	19
Plate 3. Hochstetter's frog from Miners Cove at the northern block of Great Barrier Island	71
Plate 4. Swabbing the ventral surface of a frog (<i>Photo</i> : Claudio Aguayo).....	90
Plate 5. Two Hochstetter's frogs (<i>Photo</i> : Claudio Aguayo)	103

List of Figures

Figure 1.1. Number of threatened species in different groups of vertebrates (Data source: The IUCN Red List of Threatened Species™ (IUCN, 2009)).	3
Figure 1.2. Map of the North Island of New Zealand and Cook Strait showing the distribution of all extant <i>Leiopelma</i> species (Source: Bishop, Haigh, Marshall, & Tocher (2009), Department of Conservation, New Zealand).	8
Figure 1.3. Hochstetter's frogs in different life stages. (A) Five frogs hiding together; three adults overlapping (left), one subadult (top right) and a juvenile (middle). (B) Detail of the juvenile on (A). Note the green colouration of the younger frogs (Photos: Claudio Aguayo).	11
Figure 1.4. Map of New Zealand showing the Auckland Region in detail (left), and the locations of the two Hochstetter's frog populations studied (in green).	14
Figure 2.1. Map of the Waitakere Ranges area showing the locations of all study sites (numbered from 1 to 50). The green shaded area represents regional parkland administered by Auckland Regional Council.	28
Figure 2.2 Frequency distribution of relative abundance of <i>L. hochstetteri</i> in occupied sites in the Waitakere Ranges.	44
Figure 2.3. Map of relative abundance distribution of Hochstetter's frogs in the Waitakere Ranges. Abundance categories are; LOW < 10 frogs/100m; MEDIUM = 10-25 frogs/100m; HIGH >25 frogs/100m.	45
Figure 2.4. Frequency distribution of body sizes (SVL, snout-vent length) of <i>Leiopelma hochstetteri</i> found in the Waitakere Ranges from May to December 2008 ($n=272$).	46
Figure 2.5 Relationship between detection probability and relative abundance ($n=50$). Dots represent observations and the line represents the fitted exponential curve ($y = 0.30e^{4.56x}$, $R^2=0.66$).	50
Figure 2.6. Relationship between distance to first frog found and relative abundance ($n=34$). Dots represent observations and the line represents the fitted curve ($y = 1/(0.0089x + 0.0239)$, $R^2=0.73$).	51
Figure 2.7. Relationship between time to first frog found and relative abundance ($n=34$). Dots represent observations and the line represents the fitted curve ($y = 1/(0.0066x + 0.0198)$, $R^2=0.41$).	51
Figure 3.1 Map showing the sites surveyed for Hochstetter's frogs in the central block of GBI during January 2008.	78
Figure 3.2 Map showing the location of sites surveyed for Hochstetter's frog in Miners Cove catchment in the northern block of Great Barrier Island during January 2008.	79

Figure 3.3 Map showing areas in the northern block of Great Barrier Island surveyed for Hochstetter's frog during March 2009.....	80
Figure 3.4 Map showing areas surveyed in the central block of Great Barrier Island during March 2009.	80
Figure 3.5 Map of Miners Cove Stream catchment showing presence/absence of frogs at surveyed sites, black circles represent occupied sites, while white circles represent sites where no frogs were detected.....	82
Figure 3.6 Map showing all reported Hochstetter's frog sightings in the northern block since 1980 (<i>Source</i> : Department of Conservation, New Zealand, Herpetofauna database).....	83
Figure 3.7 Detailed map of Miners Cove Stream catchment showing all reported frog sightings since 1980.	83
Figure 3.8 Map of Great Barrier Island showing all reported Hochstetter's frog sightings to date.	84
Figure 3.9 Frequency distribution of body sizes ($n=53$)	85
Figure 4.1 Map showing all swab samples taken (dots) in; a) Waitakere Ranges and; b) Great Barrier Island populations of Hochstetter's frog (both maps are at the same scale).....	97

List of Tables

Table 1.1. Threat classification of New Zealand endemic frogs by The New Zealand Threat Classification System (Hitchmough et al., 2007) and The IUCN Red List of Threatened Species™ (IUCN, 2009).	9
Table 2.1. Three different age-class classifications used for Hochstetter's frog based on snout-vent measurements (SVL) in mm.....	30
Table 2.2. Estimates with standard errors for separate age classes, using the constant model.	38
Table 2.3. Summary of model selection procedure examining factors potentially affecting detection probabilities (temperature (T); relative humidity (H); rain in the previous 24 hours (Rp); rain during survey (Rd); observer (O); time of the day (t); day of the year (D); search time (St); number of refugia searched (R); survey occasion ($time$)) with a constant model for occupancy (i.e., $\psi(.)$); w_i : model weight; k : number of parameters.	39
Table 2.4. Summary of model selection procedure examining the effects of covariates on occupancy (elevation, (E); distance searched, (DS); stream width, (SW) with a search time dependant detection probability (i.e., $p(St)$)	40
Table 2.5. Parameter (beta's and derived) estimates from the three best models. Occupancy parameters include covariates Elevation (E) and distance searched (DS). Detection parameters include search time as covariate (St), α_0 and β_0 are the intercept parameters.	41
Table 2.6. Site-specific averaged model estimates for detection probability (\hat{p}), occupancy ($\hat{\psi}$) and occupancy conditional on detection history ($\hat{\psi}_c$).....	42
Table 2.7. Percentage of the measured population on each age-class according to three different classifications.....	46
Table 2.8. Royle & Nichols (2003) models with covariates (E : elevation; DS : distance searched; St : search time) and parameter estimates ($\bar{\hat{r}}$: averaged species detection	

probability; $\hat{\lambda}$: averaged number of individuals per site, $\hat{\psi}$: averaged occupancy,
 N_t : estimated total number of frogs across 50 sites).....48

Table 2.9. Royle (2004) models and parameter estimates (\hat{p} : averaged site detection
probability (unconditional), $\hat{\lambda}$: averaged number of individuals per site, $\hat{\psi}$:
averaged occupancy, N_t : estimated total number of frogs across 50 sites).49

Table 2.10. Comparison between different sampling methods. Measures used are: (t) =
time taken for a person to *access* one site; (d) = disturbance produced in one visit;
(\$) = costs (including transport to site) of doing one survey. (*): derived from
species detection probability, not directly estimated.....53

Table 3.1 Results obtained from survey conducted during March 2009 in different
catchments of Great Barrier Island.....82