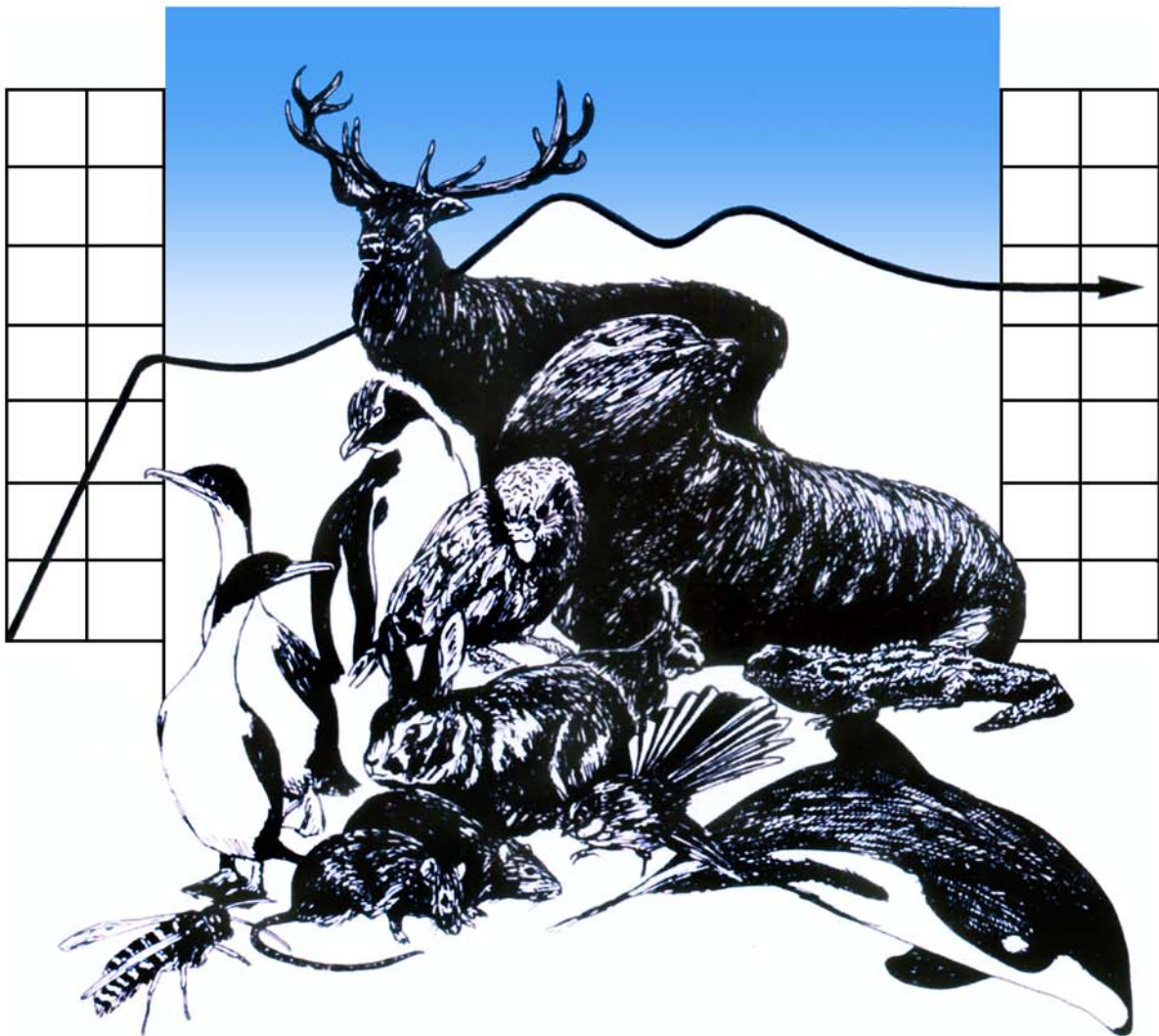




## DEPARTMENT OF ZOOLOGY



## WILDLIFE MANAGEMENT

# **Kaitiakitanga o Kā Tītī II**

## **A survey of a muttonbirding in the 2006 season**

Corey Bregg, Theresa Downs and Henrik Moller

A report to Rakiura Māori tītī harvesters

University of Otago

Year 2008

University of Otago  
Department of Zoology  
P.O. Box 56, Dunedin  
New Zealand

WLM Report Number:

218

**Kaitiakitanga o kā Tītī II**  
**A survey of a muttonbirding in the 2006 season**

A report to Rakiura Māori tītī harvesters

By

Corey Bragg, Theresa Downs & Henrik Moller

Kā Rakahau o Te Ao Tūroa - Centre for the Study of Agriculture Food & Environment  
Te Whare Wānanga o Otago - University of Otago  
PO Box 56, Dunedin

University of Otago Wildlife Management Report No. 218

November 2008

## Executive Summary

This report summarises the results of a survey of 36 randomly-selected Rakiura Māori tītī harvesters (“muttonbirders”). The survey was undertaken after the 2006 birding season, and consisted of 53 questions concerning tītī ecology and harvest practices, the value or otherwise of research and potential management responses to ongoing declines in tītī numbers. Responses were gathered during interviews, either in person or over the phone, or via a written questionnaire where this was not possible. The survey follows a similar one conducted after the 2001 season. It asked many of the same questions as the 2001 survey, so that a picture of long-term trends in birding can emerge. However, the emphasis of the 2006 survey was shifted slightly, to: (a) provide a complete survey of birders that went to the islands in 2006, and thus a snapshot of the birding community, (b) assess the birders’ views on potential management responses to falling tītī abundance, and (c) predict the number of birders that might leave birding if tītī numbers fell or increased in future. The birders interviewed in the 2006 survey ranged from 23 to 87 years in age (average 51 years), and collectively embodied more than 1000 ‘person-years’ of experience in birding. Twenty-two (61%) were male and fourteen (39%) female.

Together, the 2001 and 2006 surveys capture the knowledge and views of 59 birders, covering an excellent geographic range; 17 of the Tītī Islands and 42 different manu (family birding territories). Ninety-seven percent of birders who were approached agreed to participate in the survey and discussion flowed freely, even when covering potentially contentious or culturally-sensitive issues. The survey is therefore likely to provide an accurate reflection of opinions of the birders and a representative picture of the Rakiura Māori tītī harvesting community’s attitudes and knowledge.

## Introduction

Tītī are a taonga<sup>1</sup> of Rakiura Māori. The traditional harvest of tītī chicks<sup>2</sup> in April and May from about 30 'Tītī Islands' around Rakiura (Stewart Island) is culturally and economically important for the Rakiura Māori whānui<sup>3</sup>. It is also an important example of kaitiakitanga<sup>4</sup>, because the tītī harvest represents the last of a formerly widespread customary use of native birds that remains almost entirely within the control of Māori. The need to give effect to kaitiakitanga is written into several of New Zealand's environmental management statutes<sup>5</sup>, but concrete examples of it are still needed to define what it is and how it operates<sup>6</sup>.

The survey of practising tītī harvesters reported here is part of the *Kia Mau Te Tītī Mo Ake Tōnu Atu* ("Keep the Tītī Forever") research project, which has an overall goal of ensuring that the birds remain plentiful for Rakiura Māori mokopuna<sup>7</sup>. One aim<sup>8</sup> of the tītī research project is to compare the inferences of mātauranga<sup>9</sup> with scientific understanding of what is happening to the birds, their breeding islands and the harvests.

Prior to the surveys of birders described here, Jane Kitson interviewed 20 elders and kaumātua to record their knowledge and views learn what the community sees as important changes to birding<sup>10</sup>. Participants were selected non-randomly for those interviews - only elders and kaumātua<sup>11</sup> were interviewed, in recognition of their special knowledge and important roles as leaders and opinion makers within the tītī harvesting community.

In 2001, a questionnaire-styled survey of 23 randomly selected<sup>12</sup> active birders was undertaken<sup>13</sup>, to complement the oral history interviews. This survey sought a representative picture of the knowledge and wishes of the current birding community and used specific questions to get everyone's opinions. Many of the

---

<sup>1</sup> Taonga is a treasure. Māori language definitions follow Williams (1997) and Roberts *et al.* (1996).

<sup>2</sup> Some people use the term tītī to just refer to chicks, but it is used in this report in its wider sense of referring to adults and chicks of the sooty shearwater (*Puffinus griseus*), often referred to as the New Zealand 'muttonbird'.

<sup>3</sup> Wilson (1979). Whānui means collective families.

<sup>4</sup> Kaitiakitanga is Māori environmental stewardship.

<sup>5</sup> Examples include the Conservation Act, Environment Act, Resource Management Act and the Biosecurity Act.

<sup>6</sup> Moller *et al.* (2000). Names and authors like this refer to reports or published papers. They are listed in full at the Reference section, near the end of this report.

<sup>7</sup> Mokopuna means grandchildren.

<sup>8</sup> The research project's aims, design and methods, and how it is managed and directed by Rakiura Māori, are described in Moller (1996), Taiepa *et al.* (1997), Moller *et al.* (1999), Moller (2001a) and the project's website (<http://www.otago.ac.nz/titi>).

<sup>9</sup> Mātauranga in this context is referred to as 'Traditional Ecological Knowledge' in the international literature (Berkes 1999; Lyver & Moller 1999). It is referred to as 'Mātauranga Māori o te Taiao' by some kaitiaki.

<sup>10</sup> See *Titi Times* No 8 (2001, p. 3) and No 9 (2001, p. 11) for a description of this first phase of interviewing; Jane's thesis (Kitson 2003); and the first of the published papers from the interviews (Kitson & Moller 2008).

<sup>11</sup> Kaumātua are respected elders.

<sup>12</sup> 'Random selection' is a technique used in science to ensure that everybody has an equal chance to be surveyed. This is rather like shuffling a deck of cards very well to ensure that everyone gets the same chance in the cards they are dealt.

<sup>13</sup> See Moller (2003) for a full description of that survey.

questions arose from the oral history interviews of the elders. The interviews for the 2001 survey were conducted entirely by Bernadette Russell, a Rakiura Māori research assistant in the team.

The present report describes a second and similar survey of birders, conducted by Corey Bragg in early 2007. Corey is an active birder on Poho-o-Tairea (Big Island) and a longstanding member of the research team. The full questionnaire is included for future reference. We explain the purpose of the survey and describe how it was undertaken. We also evaluate the survey's coverage across the tītī harvesting community and direct readers to where detailed evaluation of the results can be found.

## Methods

### *Selection of Survey Panel*

The survey started before the 2007 birding season was underway, therefore the results relate to the 2006 season. Thus we refer to it as the "2006 survey" throughout this report, even though it was conducted in 2007.

Before starting the survey, we compiled a list of active birders. The starting point was our *Tītī Times* mailing list. The *Tītī Times* is an informal, 16-page newsletter about muttonbirding and the tītī research effort, distributed free of charge to anyone interested. This list was then supplemented with the names of other birders known to members of the Rakiura Tītī Island Administering Body (RTIAB) and Rakiura Tītī Islands Committee (RTIC)<sup>14</sup>. Known whānau<sup>15</sup> members were then contacted to ensure that we had a complete list of all the active birders.

From this list we selected active current adult birders, over 20 years in age. The age limit was selected as the survey targeted experienced birders, and typically birders first become fully independent from their family when they are 15 – 17 years old (Moller 2003). The birders questioned in 2001 were not eligible for the 2006 survey. This allows us to combine the information from the two surveys without fear of "doubling-up" on opinions of the same people<sup>16</sup>. In order to collect information from the broadest range of birders and islands, we surveyed a birder from only one manu<sup>17</sup> on each of the relatively small islands, but included a birder from each of a number of manu on larger islands (Table 1). The first eligible person from each manu to be randomly drawn was selected for the survey. Only one (2.7%) of the eligible and contactable interviewees in 2006 declined to be

---

<sup>14</sup> The RTIC are a group of 10 elected representatives of the wider birding community, under the auspices of the Tītī (Muttonbird) Islands Regulations (1978). They manage the day-to-day affairs of the tītī harvesting community, especially those birding on the beneficial islands. The RTIAB is a similar committee, elected to give effect to the Ngāi Tahu Settlement Act (1997) provisions. The RTIAB has a special responsibility in directing the *Kia Mau Te Tītī Mo Ake Tōnu Atu* research project.

<sup>15</sup> Whānau means family

<sup>16</sup> Inferences from the two sets of interviews can therefore be pooled without introducing what scientists call "pseudo-replication".

<sup>17</sup> Manu, as used in this report, refers to a whānau's birding territory, an area of tītī breeding colony on the Tītī Islands from which they harvest the chicks.

surveyed in 2006. Across the two surveys, a total of 59 birders were interviewed; an overall participation rate of 97% for those approached.

### ***Interviewing and Analysis***

In 2006, the survey was undertaken during interviews, either in person (one birder) or over the phone (26 birders), or via a written questionnaire (9 birders) where interview was not possible. All interviews were digitally recorded, enabling more detailed analysis of responses, explanations and qualifiers, and ranged from 26 to 127 minutes in duration.

We sought the most honest and accurate responses from the surveyed birders and therefore stressed from the outset that participation was voluntary, and that no one would know who chose to participate and who declined. Interviewees were told that this series of reports would be prepared and the collated responses would be given to the RTIAB and eventually published. Prospective interviewees were also assured that their individual responses would only ever be identified with a code (e.g. 'Birder K'), and not linked to their name, manu or island. Preliminary correspondence with the birders stressed that they could withdraw from participating at any stage and that they should not answer any questions that they felt uncomfortable with. This option was re-iterated by the interviewer just before the interview began and also noted at the start of the written questionnaire. Additionally, questions included a 'I'd rather not say' response option, should the interviewee elect not to answer a specific question. However, this option was chosen very rarely and no participants withdrew during the process. This indicates that the participants were comfortable divulging information which was often very personal, or that some might consider politically- or culturally-sensitive. Indeed, the interviews flowed freely and participants were typically eager to provide information which extended beyond the scope of the questions posed. The trust evident in the birders' responses partly reflects that Corey Bragg, the interviewer, is a well-known member of the Rakiura Māori community.

### ***Scope of the Questionnaire***

The full text of the questionnaire is provided in Appendix 1. We included some of the questions that we asked in 2001 survey in the 2006 survey, so that we could consolidate our understanding of the way birding is changing and strengthen our baseline measures against which future changes can be assessed. Repeating some of the questions also provides the beginning of a longitudinal monitoring programme, which can detect trends once further surveys are done.

In the 2006 survey, we sought information from a range of practising tītī harvesters, many of whom were extremely experienced birders, to identify the most important changes they have observed in the birds, manu and harvest practices of their whānau. The survey included questions about trends in bird abundance and changes in harvest rates and the number of people that are harvesting. This information will help assess the overall sustainability of the harvest, and enable comparison with inferences from the accumulating scientific data.

Several of the questions explored the reasons that people go birding and what the community needs most to protect about the practice. This should help the RTIAB and RTIC to support kaitiakitanga and assess the options for future management of the harvests and islands. We also polled the birders about their attitude to the tītī research, with the project now coming to an end.

Where the 2001 survey examined future research priorities and directions, the 2006 survey asked birders how they would like the community to respond to falling or rising bird numbers and increasing numbers of Rakiura Māori with birding rights. In response to reported declines in bird numbers and catch success on some manu, we asked whether the interviewees and their families would continue to go birding if their catch decreased by 10%, 20%, etc., or to the point where they couldn't recover their costs of going to the islands. Answers to these questions will help the research team to assess how the harvest pressure might change if a decline in the tītī population resulted in some birders electing to voluntarily discontinue birding.

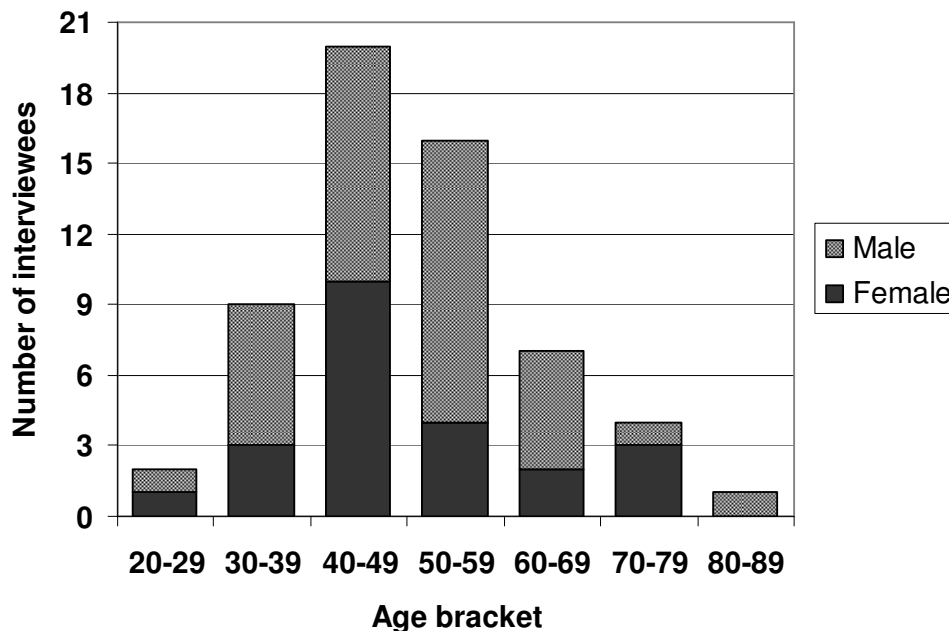
The 2006 survey also differed from the 2001 survey in that we sought a complete profile of the number, gender and ages of the people going birding. This will provide the strongest possible benchmark for assessment of future changes, both in the birding community itself, and in the harvest pressure on the tītī population.



## Results

Twenty-two (61%) of the birders in the 2006 survey were male, and fourteen (39%) were female (Fig. 2). They ranged in age from 23 to 87 years, with an average age of 51 years. Their years of experience as birders ranged from approximately 9 to 71 years<sup>18</sup>, so that an estimated total of more than 1300 'person-years' of experience was represented in the 2006 survey. The estimates of experience may be somewhat generous, as they include, where applicable, the period from 5-18 years in age, during which birders typically learn and take-on the tasks associated with birding, and also assume that the birders have not missed any years of the harvest.

In total, 59 birders were included in the 2001 and 2006 surveys. Their distribution by age and gender is presented in Figure 1. Because we used random selection to choose who was interviewed, this distribution should be quite similar to that for all of the experienced adults within the birding community.



**Figure 1. Age and gender of 59 birders included in the 2001 and 2006 surveys**

Interviewees' birding islands were spread across the southwestern, southeastern, northeastern and Ruapuke groups (Figure 2). Across the 2001 and 2006 surveys, all of the main Tītī Islands were represented, with the exception of Horomaemae, Tamaitemioka, and some small "Fisherman's" or "Lunchtime" islands, which are visited only sporadically, generally for just a few hours, during the season. Together, the two surveys included birders from 75% of the manu

<sup>18</sup> Average of 37 years experience

and 70% of the 30 islands where tītī are currently harvested, so our panel is approximately representative of the geographic spread of tītī harvesting (Table 2).

**Analysis of results from the first two surveys**

Further results from the 2001 and 2006 surveys will be progressively reported in the near future, as outlined in Table 3.

**Table 1. Analysis and reporting of 2001 and 2006 birder survey results**

Theme	2001 Question Numbers <sup>†</sup>	2006 Question Numbers*	Report
Responses of the Rakiura Māori community to the science research	61 – 66	47	Moller 2003, Moller <i>et al.</i> in prep (a)
Overall profile of birders in the 2006 season	n/a	26	Bragg <i>et al.</i> in prep.
Trends in birding	6 – 57	7 – 43	Downs <i>et al.</i> in prep.
Motivations for birding	58 – 59	44 – 45	Moller <i>et al.</i> in prep (b), Newman <i>et al.</i> in prep.
Preferred management responses to declining catch success	60, 67 – 68	46, 48 – 53	Newman <i>et al.</i> in prep.

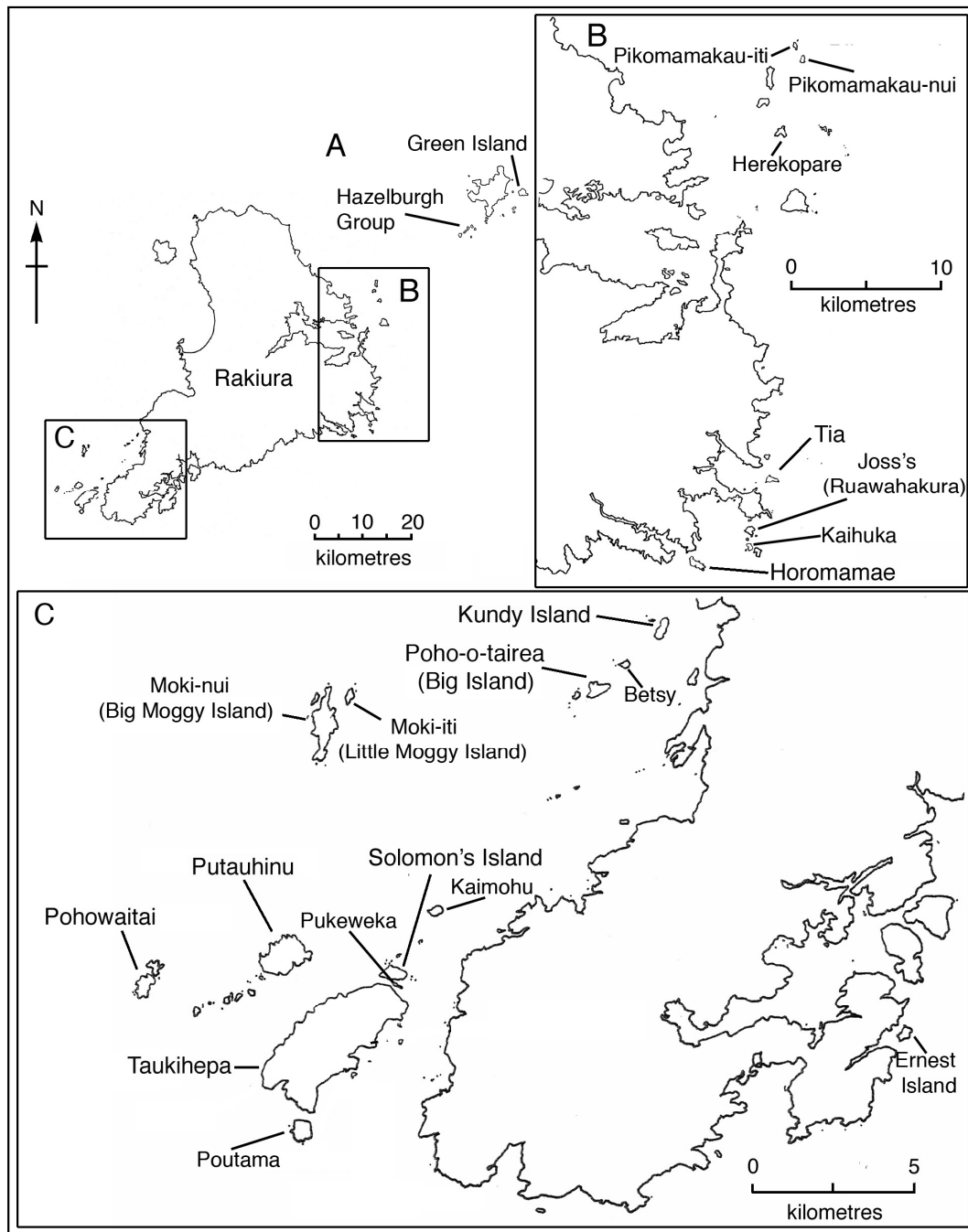
<sup>†</sup> Detailed in Appendix 1 of Moller (2003)

\*Detailed in Appendix 1 of the present report

**Table 2. Islands and manu birded by survey respondents.** Y indicates a birder from the island was included in that survey.

Group	Island	Manu	2001 Survey	2006 Survey
Ruapuke	Green Island			Y
Ruapuke	Hazelburgh			Y
NE	Herekopare		Y	
NE	Pikomamakau-iti			Y
NE	Pikomamakau-nui		Y	Y
SE	Ernest	Campbell		Y
SE		Young		Y
SE	Joss's (Rukawahakura)		Y	Y
SE	Kaihuka		Y	
SE	Tia	Aunty May's		Y
SE		Bragg (East)		Y
SE		Bragg (West)	Y	Y
SE		Gilroy (Whaitiri)		Y
SW	Betsy		Y	Y
SW	Kaimohu			Y
SW	Kundy		Y	
SW	Moki-iti (Little Moggy)			Y
SW	Moki-nui (Big Moggy)		Y	Y
SW	Poho-o-tairea (Big Island)	Governor's	Y	Y
SW		Old Ned's		Y
SW	Pohowaitai			Y
SW	Poutama		Y	Y
SW	Pukeweka		Y	Y
SW	Putauhinu	Davis manu	Y	Y
SW		Fisher manu	Y	Y
SW		Lee manu		Y
SW		Spencer manu		Y
SW	Solomon's		Y	
SW	Taukihepa	Maaka		Y
SW		Manuroto	Y	Y
SW		Match Head	Y	Y
SW		Murderer's Cove	Y	Y
SW		Paopoko		Y
SW		Parakiore	Y	Y
SW		Parata		Y
SW		Potted Head	Y	Y
SW		Puamanupatu (Boat Harbour)		Y
SW		Puketakohe	Y	Y
SW		Puwai	Y	Y
SW		Temaru	Y	
SW		Two Clover		Y
SW		Waitakua	Y	
<i>Total number of islands</i>			17	
<i>Total number of manu</i>			42	

**Figure 2. Rakiura (Stewart Island) and adjacent Titi Islands, with Interviewee's birding islands named. A: Ruapuke island group, B: Northeastern and Southeastern island groups, C: Southwestern island group.**



## Discussion

### ***Reliability of this survey***

Use of the Tītī Times mailing list appears to have been a successful starting point for the list of potential interviewees, as this newsletter is popular amongst birders, and is thought to reach the majority of the birding whānau.

The geographic coverage of the Tītī Islands for this questionnaire is thorough, with the exception of small islands ('Fisherman's manu'). We consider that sporadic 'lunch-time' birding is unlikely to provide reliable insights into the harvest or ecology of tītī, as such visits are short, usually during daytime, and repeated visits to exactly the same ground are unlikely. There is potential for a small bias from omission of potential interviewees that could not be traced from previously known addresses. If the views and observations of the more mobile members of the Rakiura Māori community differ from those of the community at permanent addresses, the findings of this survey may not represent those of the whole community. However, the fact that rate of refusal of randomly-selected, contactable candidates to participate was so low, 3% across the two surveys, makes it much more likely that unbiased results were obtained.

We were able to survey the opinion of a birder from at least one manu from 70% of the regularly birded islands (the majority from the larger islands), and spread the surveys amongst different whānau for islands which are worked as several different manu. This achieved excellent coverage for the survey.

The use of recorded interviews, where possible, in preference to written questionnaires, enabled interviewees to clarify what was meant by a particular question, and expand on, or qualify, their answers. The free-flowing and relaxed tenor of the interviews suggests that the recorded responses were an unfiltered and honest record of the birders' opinions.

Overall then, the survey is likely to be accurate and representative of the opinions of experienced adult birders throughout the tītī harvesting community. Future surveys could, however, be expanded, if a greater number of birders was able to be contacted – the main limitation of our study is that only approximately 15% of the estimated number of practicing birders have so far been interviewed (2001 & 2006 surveys combined). This figure, however, ignores the exchange of detailed information about birds and birding known to occur within manu. In reality, the knowledge and views of the individual selected for interview from each manu are likely to reflect an amalgam of their own and their wider family's experience.

### ***The value of repeating surveys like this one***

Partnership and participation have been central to the tītī project, throughout its history, including initiation of the project; development of both scientific and social goals; drawing up a cultural safety contract to protect both Rakiura Māori and researchers; sharing of mātauranga through oral history interviews with elders and these confidential birder surveys; hosting and evaluation of field research surveys on birders' manu; provision of detailed historical data on birding; checking of tikanga of all science methods; allowing scientific observations of birding in action; help in interpretation of scientific data; inviting participation in a bird monitoring panel; checking of manuscripts before publication; co-

presentation by kaitiaki and scientists at local, national and international hui; and community decision-making on all issues of access to islands. These are all ways that RTIAB and the wider birding community have asserted directorship of the research. Some of the research funds are also retained by RTIAB to enable their members to exercise this directorial role.

The surveys described here were a particularly valuable way of engaging the kaitiaki in the research, especially at the 'flaxroots' level. Many birders are understandably much more interested in what is going on at their own manu or island than elsewhere. Twenty elders participated in the initial series of oral histories, and now 59 others have participated in the two confidential birder surveys. Their obvious pleasure in being involved and contributing their knowledge, and the very high participation rates in both sets of interviews, support our belief that interviews like these are important for project ownership. Some interviewees specifically mentioned that they appreciated being interviewed because they had not had the opportunity to host the science field research teams on their manu, which they considered would be the most intensive way of learning about and guiding the research. Others mentioned that they do not always get to Permit Day hui, so the questionnaire was a way to share their knowledge. We also discovered that the opinions expressed confidentially in an interview can differ greatly from those expressed during debate that emerges on the marae. Some participants are clearly much happier to communicate one-to-one than share their opinion in community discourse. Confidentiality, and the random selection of participants, make the questionnaire approach all the more powerful for guiding community decision making, and for researchers to gauge (i) how well the science effort is supported by the community, (ii) how that support can be reinforced, and (c) the important changes, trends and issues in the minds of the kaitiaki.

The results from the 2001 and 2006 birder surveys have been archived so that they can be directly compared with the results of future surveys. The slow reproduction and long lives of the tītī mean that they have a very long generation time<sup>19</sup>. Therefore changes over very long periods need to be considered to reliably determine what is affecting bird numbers and harvest pressures. We therefore urge that Rakiura Māori plan a series of repeated surveys like this one. When coupled with a "watching brief" on the research linking the occurrence of the El Niño climate oscillation with global climate change, the surveys would provide a potentially important safeguard to ensure that the birds remain plentiful for the mokopuna. The climate link is important because it affects productivity and the survival of adult birds, and sustainability predictions crucially depend on whether or not climate change is increasing the frequency and/or intensity of El Niño events<sup>20</sup>. At least one more survey in five years time will be needed before trends can be ascertained and potential indicators can emerge.

---

<sup>19</sup> See Scott *et al.* (2008) for an estimate of titi generation time and Knight *et al.* (2008) for the importance of long-term studies of titi and seabirds in general.

<sup>20</sup> See Newman *et al.* (in prep) for the way El Niño events are killing mother birds and depressing breeding success and/or the proportion of adults that breed in a given year.

## **Recommendations**

The success of this survey leads us to form the following recommendations:

1. Use confidential interviews of randomly-selected birders every five years to gauge the opinions and knowledge of the community on important issues surrounding the tītī harvest.
2. Repeat several of the questions from previous surveys in exactly the same way in future surveys to monitor changes in birding practice and the state of the birds and manu.
3. Include in future surveys a sub-sample of the birders that were interviewed in 2001 or 2006, so that trends can be better detected. It is important to combine this with a random sample of first-time interviewees, so that fresh perspectives are canvassed.
4. From time-to-time, interview birders in a more open-ended way. A “qualitative” or oral history approach complements the questionnaire-styled approach used here. This will aid interpretation of the survey results.

## **Acknowledgements**

We would especially like to thank the birders who so generously gave their time and knowledge to help this research effort. This survey was funded mainly by the Foundation for Research, Science & Technology and a Public Good Science Fund grant to Rakiura Māori. Generous additional financial and logistic support for the overall project has been given by the University of Otago, New Zealand Aluminium Smelters Ltd., Te Runanga o Ngāi Tahu and South West Helicopters. The draft questionnaire was improved by suggestions from the Rakiura Tītī Islands Administering Body, Sam McKechnie and Jamie Newman. Thanks to Ben Knight for assistance with the map.

## References

- Berkes, F. (1999). *Sacred ecology: Traditional ecological knowledge and resource management*. Taylor and Francis, U.S.A.
- Bragg, C.; Russell, B.; Moller, H.; Downs, T.; Lach, J.; Knight, B. (in prep.). A survey of Rakiura Māori muttonbirders in the 2001 and 2006 seasons. *New Zealand Journal of Zoology*.
- Downs, T.; Bragg, C.; Russell, B.; Moller, H.; Knight, B. (in prep.). Trends in harvest practice amongst Rakiura Māori muttonbirders. *New Zealand Journal of Zoology*.
- Kitson, J. (2003). Traditional ecological knowledge and harvest management of Tītī (*Puffinus griseus*) by Rakiura Māori. PhD Thesis, University of Otago.
- Kitson, J.K. and Moller, H. (2008) Looking after your ground: resource management practice by Rakiura Māori tītī harvesters. *Papers and Proceedings of the Royal Society of Tasmania* 142: 161-176.
- Knight, B.; Moller, H., Bradley, S.; Davies, M. (2008) Austral seabird ecology and conservation: some future research challenges. *Papers and Proceedings of the Royal Society of Tasmania* 142: 1-8.
- Lyver, P. O'B., Moller, H. (1999). *Tītī harvests by Rakiura Māori: a case study of the use of Māori Traditional Environmental Knowledge for sustainable natural resource management*. Proceedings of Landcare Conference, Wellington 21 -23 April 1999. Published on Landcare Research Web page: <http://www.landcare.cri.nz/conferences/manaakiwhenua/papers/index.shtml?lyver>.
- Moller, H. (1996). Customary use of indigenous wildlife - towards a bicultural approach to conserving New Zealand's biodiversity. In: McFagen, B. & Simpson, P. (Eds). *Biodiversity: Papers from a seminar series on Biodiversity, hosted by Science & Research Division, Department of Conservation, Wellington 14 June - 26 July 1994*. Pp. 89 - 125.
- Moller, H. (2001a). Co-management of a bicultural research project: a research provider's perspective. In: Howard, M. & H. Moller (Eds.). *He Minenga Whakatū Hua o Te Ao 'Sustaining the fruits of the land'*. Proceedings of a hui, Murihiku Marae 25 - 27 August 2000. Online at: <http://www.otago.ac.nz/Zoology/hui>.
- Moller, H. (2003). Kaitiakitanga o kā Tītī I. A Māori Community's view of a science project to protect a customary wildlife harvest. *University of Otago Wildlife Management Report: No. 801-2*. 55 pp.
- Moller, H.; Bragg, C.; Downs, T. (in prep, b). Why do Rakiura Māori go muttonbirding? *New Zealand Journal of Zoology*.
- Moller, H., Cruz, J., Fletcher, D., Garrett, K., Hunter, C., Jones, C. J., Kitson, J., Lyver, P., Newman, J., Russell, B., Scofield, P. & Scott, D. (1999). *Kia Mau Te Tītī Mo Ake Tōnu Atu: goals, design and methods*. *University of Otago Wildlife Management Report No. 117*. 76 pp.
- Moller, H., Horsley, P., Lyver, P. O'B., Taiepa, T., Davis, J. & Bragg, M. (2000). Co-management by Māori and Pākehā for improved conservation in the 21<sup>st</sup> century. In: Perkins, H. & Memon, A. (Eds.) *Environmental Planning and Management in New Zealand*. Dunmore Press, Palmerston North. Pp 156 – 167.



- Moller, H.; Lyver, P.O'B.; Bragg, C.; Newman, J.; Fletcher, D.; Kitson, J.; MacKechnie, S.; Scott, D.; Rakiura Tītī Islands Administering Body (RTIAB) (in prep, a) Cross-cultural research partnerships to promote social-ecological resilience: a customary seabird harvest case study from New Zealand. *New Zealand Journal of Zoology*.
- Newman, J.; Clucas, R.; Moller, H.; Fletcher, D.; Bragg, C.; Mckechnie, S.; Scott, D. (in prep.) Sustainability of Tītī harvesting by Rakiura Māori: A synthesis report. *University of Otago Wildlife Management Report*: No. 210.
- Roberts, M., Norman, W., Minhinnick, N., Wihongi, D. & Kirkwood, C. (1996). Kaitiakitanga: Māori perspectives on conservation. *Pacific Conservation Biology* 2(1): 7 - 20.
- Scott, D., Scofield, P., Hunter, C. & Fletcher, D. (2008). Decline of Sooty Shearwaters, *Puffinus griseus*, on The Snares, New Zealand. *Papers and Proceedings of the Royal Society of Tasmania* 142(1): 185-196.
- Taiepa, T., Lyver, P., Horsley, P., Davis, J., Bragg, M. & Moller, H. (1997). Co-management of New Zealand's Conservation Estate by Māori and Pākehā: a review. *Environmental Conservation* 24(3): 236 - 250.
- Williams, D. V. (1997). Mātauranga Māori and Taonga. The nature and extent of Treaty rights held by Iwi and Hapu in Indigenous Flora and Fauna, Cultural Objects, Valued Traditional Knowledge. *Waitangi Tribunal Report Number WAI262#A15*. 148 pp.
- Wilson, E. (1979). *Tītī Heritage. The Story of the Muttonbird Islands*. Craig Printing Co Ltd, Invercargill.

## APPENDIX 1. 2006 BIRDER SURVEY

### KIA MAU TE TĪTĪ MO AKE TŌNU ATU (KEEP THE TĪTĪ FOREVER)

- This questionnaire could take about an hour.
- You can pull out at any time. If you don't want to answer a particular question, just say so and we'll move to the next one.
- Your name will not be recorded against the answers – your identity will be given a code number. Similarly the name of the island and the manu will be given a code. No one should be able to trace the responses to you and the research team will not mention even that you have been interviewed. The interview will be recorded so that we can cross check the answers as we go – otherwise we're going to have to scribble too fast!!
- The Rakiura Tītī Islands Administering Body and the Rakiura Tītī Islands Committee will not be given a copy of the coded answer sheets.
- The results of all the interviews will be presented in our final report on sustainability (June 2007).

#### PERSONAL DETAILS

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Phone/Fax \_\_\_\_\_  
Manu name \_\_\_\_\_  
Island name \_\_\_\_\_

Supervisor Yes / No

1. Which year / age did you start birding?
2. Which year age did you start birding independently (i.e. on your own, or with your own family, or keeping a separate tally)

#### MANAGEMENT REGIEME FOR MANU/ISLAND

3. Is your island operated on an open or closed manu model?
  - a. Open
  - b. Closed
  - c. Combination (i.e. family manu for nanao, open manu for torch)
  - d. Other (i.e. fisherman manu)
4. How is it done?
5. How long has your manu operated under an open/closed/combination system?
6. How long has there been birding on your manu?

#### TRENDS IN BIRDING

7. How many of the last 5 seasons did you go birding?
8. What are the most important changes in the birding, ways of birding, people going etc. over the years on your manu?
9. In the last 5 years, have you usually gone to the islands for
  - a. the nanao only

- b. torch only, or
  - c. the nanao and torch
10. Has this pattern changed over the years on your manua? Eg. Do you now go down **for the nanao**
- a. more often
  - b. about the same
  - c. less often than you used to
  - d. Don't know
11. Do you go down **for the torch**
- a. more often
  - b. about the same
  - c. less often than you used to
  - d. Don't know?
12. How long do you normally spend on the islands each season
- weeks
  - usual start date
  - usual leaving date
13. In the last five years **during the nanao**, do you catch
- a. more birds,
  - b. about the same number or
  - c. fewer birds per day than in earlier years?
  - d. Rather not say
14. In the last five years **during the torch**, do you catch
- a. more birds,
  - b. about the same number or
  - c. fewer birds per day than in earlier years?
  - d. Rather not say
15. Do you have a target tally to catch every day in the nanao?
- a. Yes,
  - b. No,
  - c. Don't know
16. If Yes, What is that tally?      chicks per day. I'd rather not say (tick).
17. **During the nanao in the last 5 years**, do you usually catch your target tally
- a. Yes
  - b. No
  - c. Don't know
  - d. Rather not say?
18. **During the nanao**, do you catch the chicks
- a. faster
  - b. slower
  - c. at about the same rate in recent years compared to earlier?
  - d. Rather not say
19. **If** the rate of catching chicks during the nanao has changed, why do you think it has changed?

- 20. **Do you have a target tally to catch every day in the torch?**
  - a. Yes,
  - b. No,
  - c. Don't know
  
- 21. If Yes, What is that tally?    chicks per day. I'd rather not say (tick).
  
- 22. **During the torch in recent years**, do you usually catch your target tally
  - a. Yes
  - b. No
  - c. Don't know?
  - d. Rather not say
  
- 23. **During the torch**, do you catch the chicks
  - a. faster
  - b. slower
  - c. in about the same time in recent years compared to earlier
  - d. Rather not say
  
- 24. **If the rate of catching your chicks during the torch has changed**, why has it changed?
  
- 25. Are there more or fewer birds in recent years compared to when you first went to your current manu?
  - a. More
  - b. Fewer
  - c. About the same number
  - d. Don't know
  - e. Rather not say

**NUMBER OF BIRDERS & HELPERS**

We now want to know about the number of people that go to your island and manu and whether it seems to be changing.

- 26. In most years, how many people bird with you and what do they do:

Name	Relationship to interviewee	Tasks (eg. catching, processing, house-keeping/cooking support, etc)	Other comments

For the previous season (2006), what was the total number of catchers \_\_\_ and helpers \_\_\_ on your manu/island.

- 27. Are there more or fewer people going **to your island** in the last 5 years compared to when you first went birding?
  - a. More
  - b. Fewer
  - c. About the same number
  - d. Don't know
  
- 28. If change has occurred, please explain detail and why it has happened.

29. Are there more or fewer people going **to your manu** in the last 5 years compared to when you first went birding?
- More
  - Fewer
  - About the same number
  - Don't know
30. If change has occurred, please explain detail and why it has happened.
31. Are there more children going **to your island** in the last 5 years compared to when you first went birding?
- More
  - Fewer
  - About the same number
  - Don't know
32. If change has occurred, please explain detail and why it has happened.
33. Are there more or fewer young people taking up birding on **your island** in the last 5 years compared to when you first went birding?
- More
  - Fewer
  - About the same number
  - Don't know
34. If change has occurred, please explain detail and why it has happened.
35. Are there more or fewer older people (over 60) birding on **your island** in the last 5 years compared to when you first went birding?
- More
  - Fewer
  - About the same number
  - Don't know
36. If change has occurred, please explain detail and why it has happened.
37. Do you think that there are too few or too many or about the right number of birders going birding nowadays?
- Too few
  - Too many
  - About the right number
  - Don't know
  - It doesn't matter

Please explain the reasons for your choice.

38. If there wasn't a helicopter available, would you still go birding?
- Yes
  - No
  - Don't know

Please explain the reasons for your answer.

39. If you are a parent of a child or teenager, are you encouraging your children to take up muttonbirding?
- Yes
  - No,
  - Don't know

Please explain the reasons for your choice

## PROCESSING

40. Do you clean the birds with
    - a. Wax
    - b. hot water, or
    - c. both?
  41. If you use wax, when did you first use it?
  42. Do you use a plucking machine?
    - a. Yes
    - b. No.
- If yes, when did you first have a plucking machine?
43. Do you make and package birds in pōhā?

## REASONS FOR BIRDING

*[We want to discover why people go birding. We have guessed at some of the reasons (following page), but we also want you to tell us any reasons we have not thought of.]*

44. Please tell us whether each of the following potential reasons is important for you to go birding.

Reason	Very Important	Important	Neither important or unimportant	Unimportant	Very unimportant	Don't Know	Rather not say	Comments on that reason
To be with my family								
To be "at peace with nature"								
For the Income								
To be in the place of my tupuna								
For the love of the work itself								
Because you like to eat the chicks								
To get a break away from mainland life and pressures								
For a holiday								
To learn / teach the traditions and histories of my tupuna								
To express my own Rakiura Māori identity								
To enable my children and grandchildren to express their Rakiura Māori identity.								
So my children and grandchildren can learn about nature.								
Other reasons								

45. If for some reason you could not return to the Tītī Islands, how would it affect you?

#### **POLICY ISSUES & RESPONSES TO CHANGING BIRD NUMBERS**

46. What do you think the Rakiura Tītī Islands Administering Body and the Rakiura Tītī Islands Committee most need to protect about birding, the way it is done etc.

47. Should the tītī research effort be happening or not?

- c. Yes it should be happening
- d. No it should not be happening
- e. Don't Know?
- f. Rather not say

48. If bird numbers and regulations stay about the same as currently, do you intend to go birding for the next 5 years?

- g. Definitely yes
- h. Probably yes
- i. Not sure
- j. Probably not
- k. Definitely not

Please explain reasons for your expectation.

49. If it were proven that the number of tītī were going to drop a lot **but that this had little to do with birding**, what would you like to see changed about current harvest and island management?

50. If it were proven that the number of tītī was going to drop a lot **because muttonbirders were taking too many chicks**, what would you like to see changed about current harvest and island management?

51. If it were proven that the number of tītī was going to **increase** a lot, what would you like to see changed about current harvest and island management?





53. If the birds decline we need to know how you personally would respond, assuming the management rules stay exactly as they are now. Please explain what's behind these decisions.

<b>Reason</b>	<b>Definitely continue going</b>	<b>Likely to continue going</b>	<b>Unlikely to continue going</b>	<b>Definitely won't continue</b>	<b>Don't know</b>	<b>Rather not say</b>	<b>Comments on that reason</b>
If your current tally increases by 50 % or more							
If your current tally increases by 40 %							
If your current tally increases by 30 %							
If your current tally increases by 20 %							
If your current tally increases by 10 %							
If your current tally stays about the same							
If your current tally drops by 10 %							
If your current tally drops by 20 %							
If your current tally drops by 30 %							
If your current tally drops by 40 %							
If your current tally drops by 50 % or more							
If you no longer catch enough to cover all of your costs.							
If you no longer catch enough to cover most of your costs							
If you no longer catch enough to recover half of your costs							
If you no longer catch enough to cover a quarter of your costs							
<b>Other reasons</b>							

**THANKS HEAPS FOR YOUR TIME AND TRUST!**