

Yellow-eyed Penguin Stock-Take Report - He pūrongo mō te Hoiho

*A report of progress against the Hoiho Recovery Plan
(Department of Conservation, 2000) objectives and actions*

2016

The Stock-take Team have endeavoured to capture faithfully the perspectives, scientific opinion and mātauranga/knowledge of contributors to the stock-take in this report. We note that some perspectives vary widely and some comments made by some contributors may factually inaccurate. Where support documentation has been provided by contributors in the form of reports and peer-reviewed publications we have included these as citations. The Stock-take Team take full responsibility only for its commentary, conclusions and recommendations based on what was heard during interviews or provided to them in writing.

Recommendations

That the Operations Director Southern South Island:

APPROVES the Yellow-eyed Penguin Stock-Take Report – <i>He pūrongo mō te Hoiho</i> (DOC-2783723) for release.	Approved Yes/No
NOTES the findings and recommendations of the stock-take report and their implications for the development of a new hoiho recovery strategy.	Noted Yes/No



Signed: Allan Munn _____

Operations Director Southern South Island

Date: 27/05/16

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He Mihi

E pōua mā, e tāua mā, rau rangatira mā,

E ngā reo, e ngā mana o Ngāi Tahu whānui

Nāia te mihi nui ki a koutou katoa!

Ko mātou ngā tāngata-tiaki o ngā manu-moana me ngā manu-ngahere

Nāia te mihi aroha ki a koutou!

Whano, whano!

Haramai te Toki!

This mihi addresses elders, rangatira and the many voices of Ngāi Tahu. Greetings to you all. We are the people who look after the sea birds and the land birds. This is a compassionate greeting to you all. Whano etc. - a saying used in speeches to signal that the group is united and ready to progress.

Whakataukī

Ko te Moana-Tāpokopoko-a-Tāwhaki

Ko te marae o Hoiho

Whakataukī means proverb. The Southern ocean is the marae of the hoiho.

Recommendations - He tūtohutanga

Based on the findings of the Hoiho Review Part 1 *A Stock-take of progress against the Hoiho Recovery Plan Objectives and Actions*, the Stock-take Team make the following recommendations to the sponsor for this review, Director - Operations, Southern South Island/ Kaihautū - Matarautaki for Stage 2 *Development of a revised Hoiho recovery strategy*:

1. Implement Stage 2 of the Hoiho Recovery Programme review; hoiho recovery in 2016 and beyond needs to be guided by a new strategy. The current Plan is no longer fit-for-purpose for the future, although many of the objectives and actions are still relevant (Part 5.3.1 (i), page 73).
2. The development of the new hoiho recovery strategy must include (Part 4.0, pages 30-31):
 - i. The perspectives of the Crown's Treaty Partner Te Rūnanga o Ngāi Tahu and Ngāi Tahu whānui. The incorporation and application of this perspective(s) is two-fold: legal obligation and tikanga (see also Part 3.1, page 23; Part 3.5.1, page 27).
 - ii. A component that specifically addresses the relationship Ngāi Tahu have with hoiho and their involvement in kaitiakitanga of hoiho (see also Part 3.1, page 23).
 - iii. An inter-agency approach for addressing relevant issues in marine and terrestrial ecosystems with clearly identified accountabilities for the associated management actions. This is a priority for hoiho because:
 - a. the species occupies marine and terrestrial environments and is exposed to pressures within them;
 - b. the species is threatened;
 - c. the species' population(s) is/are known to be in a state of decline, or in the case of the Subantarctic populations there is insufficient information available to determine their status and trend.
 - iv. Specialist technical and science, knowledge and mātauranga from within the existing (hoiho) community which includes researchers, rehabilitation experts, veterinary specialists, revegetation experts and iwi (see also Part 3.5.2, page 28).
 - v. Coverage of issues and priorities throughout the full geographic range of the species.
 - vi. Recognition that while the Subantarctic populations may be the stronghold of the species they are not an insurance population for the mainland population because they are a different genetic management unit to the mainland population.
 - vii. Objectives and actions that are SMART (Specific, Measurable, Achievable, Results-focused and Time-bound; see also Part 3.5.2, page 28).

- viii. A structure based on common and related management themes to ensure it is succinct and avoids inconsistencies (e.g. combine terrestrial management objectives 2, 3, 4, and 5).
 - ix. Strategic and effective communication and advocacy that sits alongside the mahi/work.
 - x. Better sharing and dissemination of information.
 - xi. High standards with regard to the scientific rigour of information. These are required for strategy development and ongoing recovery directed by the strategy.
3. Structure the new strategy for hoiho around biologically meaningful populations of the species rather than taking a human-centric approach (i.e. Department of Conservation district boundaries; Part 5.2.3 (iv); page 72).
 4. While the current goal of the Hoiho Recovery Plan remains relevant, the future strategy should include (Part 5.3.2 (i); pages 73):
 - i. a collective understanding from Te Rūnanga o Ngāi Tahu, papatipu rūnanga and kaimahi of what constitutes a thriving healthy population of hoiho; and
 - ii. a recovery goal of attaining a non-threatened status.
 5. Give recognition to the work being done by civil society but ensure DOC and other lead government agencies do not contract out of key (Treaty Partner) relationships with Te Rūnanga o Ngāi Tahu (Part 3.6.1; pages 28-29).
 6. Identify the Yellow-eyed Penguin Trust as a key programme partner¹ (Part 4.7.7 (v); page 61).
 7. With respect to *Objective 1* in the current Hoiho Recovery Plan (Part 4.1.9; page 39) the future strategy for hoiho recovery should:
 - i. Establish an adaptive management framework for the Hoiho Recovery Programme. This approach will require a strategy that supports:
 - a. Identification of key questions and hypotheses for informing management of hoiho for each population management unit.
 - b. Identification of key baseline monitoring data required to address key questions and hypotheses in order to inform ongoing hoiho management, including the management actions, frequency and intensity necessary.
 - c. Development of best practice guidelines/tikanga for baseline monitoring that meets these requirements, both within-season and the over long term,

¹ We use the term key programme partners to describe groups that are actively involved in multiple aspects of the programme (mahi/work, research, strategy and governance) at multiple sites across the geographic range of the species.

- particularly for the mainland populations, to guide the wider conservation effort.
- d. Establishment of minimum acceptable management thresholds of success/failure of management.
 - e. Preparation of contingencies in the event that chosen management options fail.
- ii. Assess the value of long-term population trend data for the future recovery of hoiho and what the ongoing mark-recapture component from representative sites for hoiho should be.
 - iii. Account for the diversity of sites and groups undertaking monitoring and develop protocols with those involved to support Recommendation 7(i).
 - iv. Ensure that data collection for research purposes over and above baseline monitoring meets scientific design principles.
 - v. Be strategic about what and where research information is collected by better aligning research programmes with baseline monitoring.
 - vi. Ensure wider research on hoiho complements baseline monitoring or at the very minimum does not compromise local or regional monitoring programmes.
 - vii. Establish the key drivers for obtaining population estimates for hoiho and link these to actions within the new Hoiho Recovery Strategy. Where it is necessary to estimate population numbers do so at the appropriate management level—not for the species as a whole².
 - viii. Investigate the use of ‘new tools’ to assist with monitoring where appropriate.
- 8.** With respect to Objective 2 in the current Hoiho Recovery Plan (Part 4.2.5; page 43) the future strategy for hoiho recovery should:
- i. Incorporate land use practices into a broader terrestrial land management objective for hoiho conservation; the need for a specific objective regarding de-stocking has passed.
 - ii. Advocate for a variety of terrestrial habitat management tools that can be applied locally to different sites including de-stocking (but not necessarily of sheep at every site).
 - iii. Enable the exclusion of cattle and pigs from all sites.
 - iv. Identify what, if any, management approaches can be put in place to ensure nesting areas remain accessible to penguins where access has become severely restricted due to coastal erosion. Assess the likely long-term viability of these sites if hoiho access management is implemented.

² This recommendation has implications for how the programme reports on the national status and population trend for hoiho.

- v. Develop better advocacy and engagement tools for the purpose of establishing and maintaining successful relationships with landowners for the benefit of hoiho conservation.
9. With respect to *Objective 3* in the current Hoiho Recovery Plan (Part 4.3.4; page 45) the future strategy for hoiho recovery should:
- i. Give more attention to how the land is managed in the context of hoiho conservation rather than the size of the protected area.
 - ii. DOC to consider changes in land classification at some sites to prioritise for hoiho conservation on public conservation land over other conservation land uses.
10. With respect to *Objective 4* in the current Hoiho Recovery Plan (Part 4.4.5; pages 48) the future strategy for hoiho recovery should:
- i. Ensure that revegetation and restoration objectives and actions contained within a specific strategy for hoiho are measureable in terms of hoiho recovery either directly (e.g. through increased numbers of pairs and their breeding success) or indirectly (via advocacy which results in measureable benefits to hoiho conservation).
 - ii. Apply current best practice to revegetation objectives and actions if retained within a future strategy including:
 - a. seed-sourcing
 - b. ongoing maintenance of plantings
 - c. project plans
 - d. removal of eco-junk.
11. With respect to *Objective 5* in the current Hoiho Recovery Plan (Part 4.5.6; pages 52) the future strategy for hoiho recovery should:
- i. Include terrestrial predator control as a conservation management tool for hoiho. The priorities for future predator-focused work are to:
 - a. eradicate pigs on main Auckland Island
 - b. control pigs on the mainland
 - c. investigate the significance of cats as an agent of decline on main Auckland Island
 - d. on the mainland, work at an ecological scale that reflects the predator/s biology

- e. improve the effectiveness of existing trapping networks at South Island hoiho management sites
 - f. investigate further the significance of cats as an agent of decline on Rakiura/Stewart Island.
- iii. Consider what scope there is to address marine predation threats in the context of applied management. If management options are available evaluate the extent to which marine predators (e.g. barracuda) are a significant agent of decline for hoiho.
 - iv. Require and support the application by kaimahi of current best practice for predator control, maintaining efficacy and the use of 'new tools' where appropriate.

12. With respect to *Objective 6* within the current Hoiho Recovery Plan (Part 4.6.8; page 56-57) the future strategy for hoiho recovery should:

- i. Quantify fisheries by-catch of hoiho on the basis of currently available information. Include this estimate in the new strategy.
- ii. Use this data to advise on improving the observer programme in order to reduce the Confidence Interval and obtain a more accurate and precise estimate.
- iii. Outline a series of marine protection measures to prevent fisheries by-catch of hoiho. These measures need to be big enough to result in a biologically meaningful improvement for hoiho (not just a statistically significant one) with the objective of reducing bycatch of hoiho to a biologically sustainable level.
- iv. Establish an inter-agency approach that fosters co-leadership among government agencies (i.e. between DOC and Ministry of Primary Industries - MPI), in partnership with Ngāi Tahu, and linkages to other programmes and forums at the eco-system level (e.g. marine mammal protection; South-East Marine Protection Planning Forum/Roopu Manaaki ki te Toka).
- v. Use this interagency approach to support productive liaison with the fishing industry via an appropriate forum/s.
- vi. Endorse regional input into relevant marine forums (e.g. marine protection forums and fisheries management forums) but not at the expense of direct action toward mitigating threats to hoiho at sea.
- vii. Include direct and indirect threats to hoiho at sea; be specific about what marine-based research is necessary to inform hoiho recovery priorities and actions.
- viii. Consider the full range of tools in the management kete including the application of Māori management tools such as rāhui.

13. With respect to *Objective 7* within the current Hoiho Recovery Plan (Part 4.7.7; pages 61-62) the future strategy for hoiho recovery should:

- i. Define what is meant by advocacy in the context of hoiho recovery.
- ii. Ensure advocacy objectives and actions that are likely to produce tangible outcomes for hoiho recovery. Create strategic linkages with other broader advocacy initiatives (e.g. coastal restoration, marine protection).
- iii. Ensure appropriate input for Stage 2 from a social scientist with experience in Community-Based Social Marketing. This recommendation is also relevant in terms of working with the fishing industry.
- iv. Determine the most appropriate community forum/s to maintain/reinstate to deliver a revised advocacy objective. Be clear with participants about the accountability for leadership and purpose of these forums.
- v. Include Ngā Rūnanga perspective that support for hoiho can be whānau-based working alongside DOC as partners and other lead government agencies including Ministry of Primary Industries. With respect to the mahi, extend this concept to key programme partners including the YEP Trust. This model would support the development and/or preservation of mātauranga and the weaving of mātauranga and western-science-based knowledge together.
- vi. Establish a support and coordination network for the rehabilitation community in the development of a cohesive and strategic programme of work for rehabilitation as a conservation management tool for hoiho recovery.
- vii. Work with the rehabilitation community to fill existing research/knowledge gaps and to interrogate the data that already exists.
- viii. Work with the community of rehabilitation experts and providers and veterinary specialists to revise and adopt best practice.
- ix. Review rehabilitation authorities to ensure a focus on the welfare and clinical needs of wild birds.

14. With respect to *Objective 8* within the current Hoiho Recovery Plan (Part 4.8.6; page 65-66) the future strategy for hoiho recovery should:

- i. Advocate for policy within the relevant Conservation Management Strategies and Conservation Management Plans that supports recovery of the hoiho over and above visitor access to the birds. Account for the full range of tourism activities/tourist behaviours over a range of sites. Note Recommendation 14 (i) links to Recommendations 9 (i and ii).
- ii. Outline the role and benefits of a range of regulatory tools (e.g. rahui; changes to land classification) for hoiho recovery.

- iii. Develop, implement and monitor the success of methods to modify the behaviours of visitors so as to eliminate their impact on the breeding success of hoiho and the future population growth of the species.
- iv. Where it is required measure the impacts of tourism on hoiho directly.

15. With respect to *Objective 9* within the current Hoiho Recovery Plan (Part 4.9.6; page 69) the future strategy for hoiho recovery should:

- i. Confirm the importance and priority of progressing research about marine pressures and management approaches for hoiho recovery.
- ii. Include a specific research/knowledge strategy for hoiho encompassing:
 - a. a clearly defined purpose;
 - b. western science and mātauranga; and that
 - c. priority is given to understanding the marine ecology of hoiho and agents of decline within the marine system.
- iii. Support research that clearly demonstrates conservation management benefits to hoiho. Researchers must be able to clearly convey why the research needs to be on hoiho specifically.
- iv. Establish and maintain an adaptive management framework for the hoiho conservation programme through ensuring that management outcomes are monitored, assessed and used to inform adjustments to future management.

16. DOC to invest in hoiho recovery at the appropriate level: governance, leadership and technical support. On the ground give appropriate support to the community groups to do the mahi/work (Part 5.2.3 (iii); page 72).

17. Provide greater clarity around DOC leadership and management roles pertaining to hoiho and responsibilities for operational/delivery work on hoiho (Part 5.7.2 (ii); page 77).

18. Ngāi Tahu in partnership with DOC will share in hoiho recovery/kaitiakitanga at all levels: governance and decision-making, technical support through specialist groups, and the mahi/work (Part 3.6.1; pages 28-29).

19. Enable Yellow-eyed Penguin Trust to invest in hoiho recovery at the appropriate level: leadership and technical support as well as on-the-ground management to support kaimahi/penguin community groups (Part 5.2.3 (iv); page 72).

20. Critically evaluate all of the key components listed in Part 5.4.1 for achieving long-term recovery of hoiho (Part 5.4.3; page 74). Give priority to:

- i. research and management that is likely to provide significant recovery outcomes and that can be solved in the short term;
 - ii. a ‘mass mortality’ operational plan and strategic framework for rehabilitation of hoiho as a conservation management tool;
 - iii. developing a clear understanding of the long-term data needs and the development of a reliable, accessible and fit-for purpose data management system to deliver this;
 - iv. advocating for sufficient resourcing to do the work that is required to an acceptable standard.
- 21.** DOC to curate the existing YEP database so that it is error-free. The information required to do this work is available. This work should be done immediately so that the available data can be used to inform Stage 2 (Part 5.5.3 (i); page 76).
- 22.** Define the purpose and needs of data management to support the new hoiho strategy (Part 5.5.3 (ii); page 76).
- 23.** Investigate alternative database software options to align with the new Hoiho Recovery Strategy and address issue of data accessibility, data entry and maintenance (Part 5.5.3 (iii); page 76).
- 24.** Resolve critical issues³ around the permanent marking of birds (5.6.2.(ii); page 77) including:
- a. further development of standards and best practice; and
 - b. the removal of barriers to meeting best practice.
- 25.** Provide access to expertise for technical and strategic advice via a hoiho or penguin species specialist group (Part 5.7.2 (i); page 77).

³ Permanent marking of birds is a side issue but critical to the programme. It has not had the focus required to progress key issues which include: the quality of banding, transponders being used manually as opposed to part of an automated system errors associated with transcribing transponder numbers and the appropriate style of external marks.

Māori-English translation – He whakamāramataka

kaimahi	Staff/worker
kai	Food/to eat
kaitiaki	Guardian/caretaker
kaitiakitanga	guardianship
kanohi ki te kanohi	Face to face
kaupapa	Theme or project
kaupapa tīpoka	summary of purpose
ki uta ki tai	From the mountains to the sea
kōrero	Talk/discussion
mahi	work
mahinga kai	customary gathering of food and natural materials and places where those resources are gathered
Mana moana	authority over the sea and lakes
mana whenua	territorial rights, power, authority over land or territory, jurisdiction over land or territory - associated with possession and occupation of tribal land.
mātauranga	knowledge
Papatipu Rūnanga	Marae-based councils administering the affairs of the hapū, as referred to in section 9 of the Te Rūnanga o Ngāi Tahu Act 1996.
rāhui	Restriction/reservation/exclusion under tribal authority and marker warning of this. Also a statement that a resource is being actively managed
rangatiratanga	the powers and qualities of chiefly leadership, and exercise of tribal authority. Self determination
rūnanga	tribal council
takiwā	Tribal or hapū district or area
taonga	Treasures/possessions, material or abstract
tautōhito	experience
tikanga	Customs/guidelines
tupuna	ancestor
kōrero waea	Telephone conversation
te ara ki mua	the pathway ahead
whakapapa	genealogy
whānau	Family/extended family

For additional Māori-English, English-Māori translation we recommend:

[Te Aka Māori-English, English-Māori Dictionary and Index](#)

Additionally for place names we recommend:

[Land Information New Zealand](#)

Part 1

Introduction - He kupu whakataki

1.1 Background - Te horopaki

Hoiho, [1,2] or yellow-eyed penguin (*Megadyptes antipodes*) are endemic in Aotearoa/New Zealand with a range extending along the south-eastern coast of Te Waipounamu/South Island from Te Pataka o Rakaihautū/Banks Peninsula in Canterbury to Motu Ihupuku/Campbell Island in the Subantarctic islands. Vagrants extend this range as far north as the Southern North Island.

Hoiho are recognised as a taonga species within terms of the Ngāi Tahu Claims Settlement Act 1998 [3]. At a national and iwi level, Te Rūnanga o Ngāi Tahu are recognised as having a particular relationship with hoiho. Mahinga kai relates to the traditional harvesting of penguin eggs by Ngāi Tahu tūpuna [4], particularly in Murihiku. Multiple archaeological sites have evidence of adult hoiho remains taken for kai (and/or the *Megadyptes waitaha* [5]).

In terms of its conservation status the hoiho is classified as Nationally Vulnerable in the New Zealand Threat Classification System based on estimated population size and trend with a qualifier of extreme fluctuations⁴ [6]. It has one of the widest latitudinal ranges of any threatened species in New Zealand (8 degrees of latitude). The biology of the species has been extensively reviewed [7,8,9]. The current Hoiho Recovery Plan 2000-2025 [10] was published by the Department of Conservation (DOC) in 2000. The long-term goal for the duration of this recovery plan is: “*Hoiho populations have increased and the community is actively involved in their conservation.*”

The Hoiho Recovery Plan lists nine objectives and 31 action points required for achieving this goal. It is stated in the plan that “*The goal will be achieved when the IUCN threat status and the Department of Conservation’s priority status of hoiho has been improved by at least one category.*” While the plan establishes a realistic time-frame for achieving the stated goal, 25 years (2000-2025), it was written on the basis that it would endure for as long as the goal, objectives, and actions contained within it remain relevant; it states that the recovery plan would be reviewed in 2010. An interim assessment of progress against the recovery objectives was made by the Hoiho Recovery Group Leader, Bruce McKinlay, in 2010 and presented at the Yellow-eyed Penguin Annual Symposium [11].

⁴ [From Robertson et al. 2013] Extreme Fluctuations (EF) [definition of]: The taxon experiences extreme unnatural population fluctuations, or natural fluctuations overlaying human-induced declines, that increase the threat of extinction. When ranking taxa with extreme fluctuations, the lowest number of mature individuals should be used for determining population size, as a precautionary measure.

Hoiho are the focus of considerable community-based conservation effort, from site-specific predator control to strategic advocacy and management activities across the species' geographic range.

Terrestrial habitat used by hoiho spans old growth forest in the Nature Reserves of New Zealand's Subantarctic Islands through to grazed mid-latitude privately owned farms. A significant part of its terrestrial range is within easy access of humans and, as such, this access engenders a sense of engagement and commitment from the community.

Hoiho are reliant on the marine environment. As inshore foragers their range overlaps with recreational and commercial fisheries. A shared understanding and value of hoiho among users of the marine environment and marine resources is not as well developed as it is among land owners and users.

In 2014, a grant from Pūtea Tautiaki Hapori/Community Conservation Partnerships Fund administered by DOC, was allocated to yellow-eyed penguin recovery. This grant, for operating expenses⁵, was given to the Yellow-eyed Penguin Trust contingent upon “*a review of yellow-eyed penguin recovery with Terms of Reference to be developed jointly by Yellow-eyed Penguin Trust, Ngāi Tahu, and the Department of Conservation*”. The review would be undertaken in two stages: Stage 1 a stock-take of progress against species recovery objectives in the existing Hoiho Recovery Plan 2000 - 2015, and Stage 2, a revised strategy for hoiho recovery.

This report is the output of Stage 1.

The purpose of Stage 1 is:

1. Assessing and documenting how well conservation management and research for hoiho is meeting the objectives set out in the current Hoiho Recovery Plan.
2. Evaluating the objectives of the plan and associated kaitiakitanga and conservation of this species.
3. Measuring the appropriateness of the recovery objectives/actions and identifying gaps, with a view to developing a revised strategy for recovery of the species.

The stock-take must be fit-for-purpose in order to inform Stage 2 of the review; the revision of the management strategy/recovery plan.

It has become increasingly evident during the course of the stock-take that the mainland (south coast) hoiho population is undergoing serious decline due to successive poor breeding seasons and ongoing higher than average adult mortality. This critical situation has put those undertaking the work (kaimahi) under a lot of pressure to change what they are doing with hoiho now in response to the

⁵ The YEP Trust's participation in the Stock-take has been self-funded.

current state of the south coast hoiho population. At the same time, it has been essential for the Stock-Take Team to remain focused on completing this report in order to support the development of an enduring and meaningful recovery strategy for hoiho that extends beyond the outcomes of the latest breeding season.

1.2 Mana whenua - customary authority

Hoiho occur within the takiwā of fifteen Ngāi Tahu Papatipu Rūnanga. Each holds mana whenua and mana moana kaitiaki responsibilities of customary authority over the land, waterways, and sea of their respective takiwā (refer to Appendix 1).

All Rūnanga administer the role of kaitiaki stewardship and have responsibility for environmental issues within their takiwā. This concept is known as kaitiakitanga (guardianship), and responsibility is documented in the Ngāi Tahu Claims Settlement Act 1998 [3], and in Te Rūnanga o Ngāi Tahu Act 1996 [12].

Kaitiakitanga has been defined as the exercise of guardianship by mana whenua (local people) of the area in accordance with Tikanga Māori (custom) in relation to both natural and physical resources, and includes the ethic of stewardship (as defined in the Resource Management Act 1991 S2 [13]).

It is important to note that in matters to do with the management of natural resources within the individual takiwā, each Rūnanga has responsibility for its management as kaitiaki and should be engaged individually.

The Ngāi Tahu approach to natural resources is based on the philosophy of “Ki uta ki tai” - from the mountains, to the sea - the whole resource chain from mountain top to ocean floor.

For the many future generations of Ngāi Tahu that will value and protect the countless resources and qualities associated with the environment, Ngāi Tahu today value and adhere to the principles of:

Mō tātou, ā, mō kā uri ā muri ake nei - responsibility to sustainability manage; and
Ngāi Te Ruahikihiki - maintain ancestral connections to the land, water and *mahinga kai* through the principle of *Rangatiratanga, ahi kā roa and kaitiakitanga*.

These principles encompass the responsibility to care for, protect, and wisely use resources.

The Ngā Rūnanga contribution to this stock-take is an expression of kaitiakitanga and rangatiratanga. It is the collective efforts of fifteen Papatipu Rūnanga and two individuals representing Waitaha and Whenua Hou.

1.3 Stock-take Team and accountability structure - Ngā tāngata me ngā kaiwhakahaere

The stock-take was led by DOC, its Treaty Partner Ngāi Tahu, and the Yellow-eyed Penguin Trust, a key programme partner in assisting with the species' recovery. Group representation on the Stock-take Team has been set by the Minister of Conservation who holds legislative responsibility for the security and recovery of hoiho.

The team undertaking the stock-take was made up of representatives of the three lead entities: Bruce McKinlay - DOC, YEP Recovery Group Leader, Project lead; Sue Murray - General Manager, Yellow-eyed Penguin Trust; and Yvette Couch-Lewis - Te Rūnanga o Ngāi Tahu Species Recovery Representative for Hoiho. Kerri-Anne Edge Hill, under contract to DOC, provided strategic advice and support to the Review Team to undertake the stock-take.

Within DOC the sponsor for the stock-take is Allan Munn, Kaihautū - Matarautaki/Director - Operations, Southern South Island, with Rosalind Cole (Conservation Services Manager, Operations Manager - Murihiku), acting as his delegate.

For the stock-take Bruce McKinlay (Stock-take Team Leader) reported to Avi Holzapfel (Pou - Kāhui Hangarau – Pūtaiao/Terrestrial Ecosystems Manager)⁶ who provided managerial oversight on behalf of Carol West (Kaihautū - Toi Taiao/Director, Terrestrial Ecosystems).

For Te Rūnanga o Ngāi Tahu, Yvette Couch-Lewis was supported by and reported to Jason Arnold who in turn reported to Te Rūnanga o Ngāi Tahu Governance Board.

For the Yellow-eyed Penguin Trust, Sue Murray reported to the Yellow-eyed Penguin Trust Board Chair, Eric Shelton.

1.4 Terms of reference - Ngā whakataunga mō ngā whakapuakitanga

This stock-take report is prepared to meet the following standards [taken from the agreed Terms of Reference for 'the stock-take'].

The stock-take report will be a public document and needs to:

- Part A.** Contain a brief context section outlining: YEP biology, status, history of recovery and research efforts, key stakeholders etc. Much of this section can be taken from, or refer to, the existing recovery plan and other recent review documents such as Seddon *et al.* (2013; [9]) and Ellenberg & Mattern (2012; [8]).

⁶ This role was filled by Laurence Barea in November/December 2015 and Oliver Overdyck from February 2016.

Part B. Contain as the main body of the document:

- b. A robust assessment of progress against each of the actions, objectives and goal(s) in the recovery plan.
- c. Progress not directly linked with the recovery plan, including reasons why there may have been progress not specified by the plan. This assessment needs to include:
 - a. the provision of science research and the provision of conservation craft;
 - b. the quality and appropriateness of the original actions, objectives and goals in the recovery plan; and,
 - c. effectiveness of implementation mechanisms, including accountabilities, role clarity, technical and strategic support, communication and relationships between stakeholders.
- d. Gaps in the current recovery strategy (the 'what' not the 'how').
- e. Questions that inquire about the Treaty partnership between DOC and Ngāi Tahu, the Ngāi Tahu Settlement and the role of Ngāi Tahu whānui and their kaitiakitanga of hoiho.

Part C. Make recommendations to inform the development and or confirmation of Stage 2 of the review.

The level of detail needs to be sufficient to provide a clear picture of achievements and guide future strategy and planning, without an expectation that the review will provide an exhaustive account. The appropriate balance needs to be determined as data are collated. The current review will be undertaken in two stages, with Stage 1 being the stock-take, followed by Stage 2 - the development/confirmation of the recovery strategy for the next 10 years (final span to be confirmed).

The Stock-take Team note that quality information is widely available in published literature regarding the biology, status, history of recovery and research efforts of hoiho. Therefore, an account of the general biology of hoiho has not been included in this report.

Part 2 Approach - Te mahere

2.1 The pathway ahead - te ara ki mua

Before Nga Rūnanga could contribute to the stock-take it was deemed critical to bring together what was known of the whakapapa of hoiho as a working tool in establishing the kaupapa and future direction they wish to pursue. A paper on this topic was commissioned from Te Rūnanga o Ngāi Tahu, Heritage - Puna Mahara Team, Tribal Interests Group and is reported on in Part 3[1].

2.2 Ngā Rūnanga

For Ngā Rūnanga communication was with:

- 15 Rūnanga Offices
- 23 nominated Rūnanga representatives
- 1 representative Waitaha descendant
- 1 representative from the Whenua Hou Committee

Refer to Appendix 1 for detail.

2.3 Ngā Kaimahi

In this report kaimahi refers to all individuals, groups, and entities actively undertaking work with hoiho, either directly or indirectly (e.g. operational and advocacy personnel from government and non-government agencies, volunteers, researchers, and landowners actively engaged in hoiho conservation and advocacy). Kaimahi also refers to individuals, groups, and entities with a connection to hoiho (e.g. stakeholders, benefactors, fishers and the fishing industry, landowners with hoiho nesting on their property etc.). Some individuals were represented both within Ngā kaimahi and Ngā Rūnanga.

A list of approximately 150 individuals/agencies was compiled from existing DOC and Yellow-eyed Penguin Trust (YEP Trust) files.

2.4 Engagement - Te kōrero whānui

An introductory letter outlining the Stock-take's purpose, objectives and Terms of Reference was sent as an email or hard copy from the Stock-take Team (in the case of Ngā Rūnanga from the Ngāi Tahu representative) to all individuals and/or groups described above. The letter invited people to contribute and requested confirmation of participation for future correspondence.

A questionnaire based on the Hoiho Recovery Plan and other identified priorities was developed by the Stock-take Team. These questions are provided in Parts 3, 4 and 5 of this report.

The questionnaire was sent to all participants so that they could prepare for a meeting with the Stock-take Team, Ngāi Tahu representative, or opt to provide a written submission.

Kanohi ki te kanohi/face-to-face meetings with participants took place in Canterbury, Dunedin, the Catlins, and Invercargill. Anyone who was unable to be present for a meeting at one of these locations was interviewed via a telephone conference. The full Stock-take Team were present for the majority of interviews with kaimahi.

As the process proceeded some additional people were identified and added to the interview schedule.

Interview notes were sent back to individual participants to confirm their accuracy and for further contributions.

2.5 Analysis - Te tātaritanga

Individual replies from participants were collated for each of the questions which were then reviewed qualitatively to identify common themes, perspectives and outlier responses (i.e. knowledge or perspectives different from a commonly held view).

A summary of responses to questions 1-5 is provided in Part 3: Initial Findings. Answers to these questions were used by the Stock-take Team to characterise the diversity of participants; specifically to develop an understanding about the participants past and present involvement with hoiho and to recognise specific mātauranga/knowledge and tautōhito/experience that informed their responses to questions 6-51. The responses recorded in Part 3 also fed into recommendations elsewhere in the report, particularly with regard to the Treaty Partnership between Ngāi Tahu and DOC and the Ngāi Tahu responsibility as kaitiaki to be involved in managing the well-being of their taonga species, the hoiho.

Answers to questions 7-44 were used to assess progress against the Hoiho Recovery Plan objectives and actions and to identify gaps in the existing recovery strategy. The results of this component of the stock-take are presented in Part 4. For each recovery plan action, the key perspectives, science opinion and knowledge/mātauranga and a brief concluding statement by the Stock-take Team are provided. Part 4 also includes summaries of the key over-arching themes identified, interpretation of these by the stock-take review team and recommendations from the review team for the content and focus of the new strategy.

Additional priority questions were also included (questions 45-51) regarding possible gaps in the existing strategy and one area of immediate concern: the Yellow-eyed Penguin (YEP) database. Key themes, additional comments from the Stock-Take Team and recommendations for Stage 2 from these questions are presented in Part 5.

2.6 Language - Te Reo

In the main report ‘ng’ is used for Ngāi Tahu, consistent with the regional dialect used in the Ngāi Tahu Claims Settlement Act 1998 [3]. In the supplementary material provided to contributors of the stock-take iwi members may refer to Kāi Tahu rather than Ngāi Tahu. Southern regions in the South Island sometimes exchange the ‘ng’ with a ‘k’ in pronunciation and in spelling of words where the ‘ng’ occurs in dialects used in the north of Te Waka-o-Māui/South Island and in Te Ikaroa-a-Māui/North Island.

Part 3

Initial findings - Ngā kitenga tīmatanga Kaupapa tīpoka, participants and perspectives - ngā kaiuru me ngā whakaaro

Part 3 outlines our initial findings. The kaupapa tīpoka provided a start point for discussion with Ngā Rūnanga about the current Hoiho Recovery Plan.

We used the information presented in Part 3 to evaluate the level of mātauranga/knowledge held by all participants in regard to hoiho conservation and/or research or their particular specialist field.

3.1 Summary of purpose - Kaupapa tīpoka

The view of Ngāi Tahu representatives engaged in early planning for a review of the Hoiho Recovery Programme was that the current recovery plan lacks a component that specifically covered the relationship Ngāi Tahu have with hoiho and their involvement as kaitiaki of the birds.

Kyle Davis' paper ([1]; see Appendix 2) clearly identifies the relationship that Ngāi Tahu have with hoiho and recommends that papatipu rūnanga pursue a direction of involvement in the management of the birds to ensure their survival and future state where the population is self-sustaining enough to warrant a cultural take:

“It is recommended that Ngāi Tahu should seek to be involved in the management of this species, as with other Taonga species, in the hope that in the future, a self-sustaining population of this species maintains its ecological niche in balance with other species in the ecosystem and maybe sustainably utilised for mahinga kai by Ngāi Tahu.”

Whānau interviewed agreed with this recommendation, however, they also agreed that the wording needs to be tightened to reflect why a cultural take is important and that it would not be detrimental to the recovery of the species; an example being:

“A self-sustaining population of hoiho maintains its ecological range in balance with other species in the ecosystem. A self-sustaining population can sustain a cultural harvest for mahinga kai purposes by Ngāi Tahu.”

The overarching comment was that whānau saw it to be their responsibility as kaitiaki to be involved in managing the well-being of their taonga species, Te Hoiho.

3.2 Participants - Ngā kaiuru

A diversity of expertise was represented among participants in the stock-take. This expertise covered penguin biology, rehabilitation, veterinary science and practice, operational experience, research, fisheries science and issues, marine and terrestrial ecology, coastal re-vegetation, statistical/database, communications and advocacy. Additionally, mātauranga and observations of particular hoiho populations, land and marine areas and fisheries, built up over a life time or sometimes several generations, formed an important contribution to the stock-take and resource for informing Stage 2.

3.2.1 Ngāi Tahu Papatipu Rūnanga

Twenty-five individuals from thirteen Ngāi Tahu Papatipu Rūnanga participated in the stock-take kanohi ki te kanohi (12), via phone interview (3) or written submission (3) (Appendix 1). A phone interview was conducted with a representative descendant of Waitaha and a written submission was also received. Written communication was received from the Chair of the Whenua Hou Committee.

Ngā Rūnanga member's responses to questions were based on direct experience, knowledge and mātauranga from working with hoiho or from media sources. They receive updates through DOC's Roopu Kaitiaki⁷ hui and want this level of involvement to continue. The takiwā of each participant influenced whether their insight was based on direct experience of hoiho or learning from other sources. Participants described hoiho as a taonga species for Ngāi Tahu and outlined how each reo kōrero/representative is responsible, as kaitiaki, to be aware and to contribute to the welfare of the hoiho within their respective takiwā, and to maintain rangatiratanga over how the management is carried out.

Participants had either: not seen hoiho or been involved with their management; had seen them while at sea and on shore; and/or have regular contact and involvement with hoiho recovery at a governance or management level. With the exception of a few individuals from Te Rūnanga o Ōtākou and Te Pātaka o Rākaihautū, Ngāi Tahu whānau have had little direct involvement with the Hoiho Recovery Programme in the last 15 years. Murihiku whānau are well aware of the hoiho within their takiwā and have interactions with the birds on their own islands. They have a practice of leaving the birds alone and keep their knowledge close to themselves.

⁷ The term Te Roopu Kaitiaki is used in Canterbury and Ōtākou. Te Kaitiaki Roopu is used in Murihiku.

Ōtākou whānau are involved in recovery work and the management of the hoiho on their land and other private land. Restoration work on whānau land is for the benefit of all species and the quality of the water and land. Whānau see the benefits of leaving the colonies alone yet would support rehabilitation when the colony needs help.

Participants from North Ōtākou (Waihao and Arowhenua) have not seen hoiho, however as kaitiaki the principles and values associated with the protection of a taonga species is paramount and is reflected in their responses.

North of Arowhenua is Te Pātaka o Rākaihautū and Ōtautahi. Te Pātaka o Rākaihautū is similar to north Ōtākou with only one participant having had close contact with the birds. Two other Rūnanga have more direct involvement with white-flipped penguins. However whānau on the peninsula are aware of a number of hoiho pairs at Pōhatu and in Gough Bay on private land. There was a sense of responsibility for these pairs in recognition of their role as kaitiaki, the principles and values associated with the protection of the taonga species is paramount.

3.2.2 Kaimahi

Seventy-three kaimahi contributed to the stock-take via face-to-face and phone interviews (71) or by written submission (2) (Appendix 1). Over nineteen agencies/entities were represented among the participants. Of those participants working directly with hoiho and/or managing habitat for hoiho, the term of their involvement ranged from very recent (months) to several decades.

Among the group there was enormous variation in depth of understanding and experience depending on an individual's background, experience and role, if any, within the programme. Responses were based on both direct experience of hoiho, scientific investigation and what they have heard from others. The majority of perspectives were specialised or focused on one particular location rather than knowledge and experience of the population as a whole. The YEP Annual Symposium was noted as an important source of information across the whole geographic range of hoiho (see also Part 4.7.2, page 57).

3.3 Current population status of hoiho - Te nuinga o ngā hoiho

3.3.1 Perspectives on the population status of hoiho held by Ngā Rūnanga

All Ngā Rūnanga participants responded to questions about the current population status of hoiho as it has a direct link to their responsibility as kaitiaki. Universal agreement was reported that the hoiho population is in decline and there are not as many penguins seen now as there were 20 years ago. Ngā Rūnanga wish to see a healthy self-sustaining population.

There was a view that the hoiho population is in decline as a result of loss of habitat due to human population growth and land subdivision, human intervention through impacts from tourism and over fishing, and predation by introduced mammals. Some held the view that the population in the Catlins was not in decline but stable.

There were no responses regarding hoiho inhabiting the Subantarctic Islands; however, the islands are within the takiwā of Awarua, which is within the geographical area of Murihiku where whānau have regular interactions with the birds on their own islands.

Regional perspectives relate to concern about the impact of climate change on food resources for the hoiho populations.

Understanding was expressed about the impact of removing hoiho chicks to protect adults that were known to be ‘super breeders’: individual birds that have been identified as having consistently high reproductive success, or could (in future) be predicted as having high life-time reproductive success.

Recognition was given to some successful conservation efforts on the Ōtākou Takiwā Peninsula.

3.3.2 Perspectives on the population status of hoiho held by kaimahi

Generally, there is widespread recognition among the groups of the decline in the South Island and Rakiura/Stewart Island populations. It is also assumed by many (but not all) that the Subantarctic hoiho population is large and robust and some view this population as ‘insurance’ with respect to the mainland population.

Terrestrial management of habitat and predators is under better management than 20 years ago. Unregulated tourism, marine threats and changes to the marine environment are considered the most significant threats.

3.4 Characteristics of a functioning and healthy population of hoiho - Te hauora o ngā hoiho

3.4.1 Characteristics of a functioning and healthy hoiho population as outlined by Ngā Rūnanga

In a healthy population hoiho would be increasing in number; birds would be seen breeding, socialising, and moulting.

Hoiho would have food, shelter and be free of predation, standing tall in their own place.

Hoiho would maintain their ecological range and live in balance with other species in the ecosystem.

3.4.2 Characteristics of a functioning and healthy hoiho population as outlined by kaimahi

It is all of the following:

- Breeds so successfully throughout its original natural range that it creates pressure to reoccupy a majority of its original sites.
- Breeding populations are able and permitted to occupy much of their former extent on the coastal landscape.
- Breeds under vegetation cover familiar to the species throughout its evolutionary and pre-human histories.
- Abundance and viability are only rarely compromised by unnatural [extreme] rates of mortality induced by external causes (predation, bycatch, disease, habitat destruction, inter-specific competition, food shortages etc.) or by intrinsic genetic threats.
- Is viable (self-sustaining) in every sense and thus capable of rebounding unassisted from natural knockdowns, resisting novel pathogenic threats and preserving both its immediate genetic fitness and its evolutionary potential.
- Each population treated as separate management groups with 500 pairs in each (Campbell Is.+ Auckland Is. + Stewart Is. + Mainland). An appropriate ratio of non-breeding adults to juvenile birds indicates a growing or sustaining population and there is evidence that non-breeding adults are young birds rather than birds that have lost mates.
- Where hoiho can play a functional role in the ecosystem and there are no major particular threats. This means the population would need to be at a level where you could see/determine how they fit into the ecosystem, describe trophic levels and interactions, and the numbers of one species preying on another.

3.5 Recovery Plans - Ngā mahere whakaora

3.5.1 Perspectives on species recovery plans and the existing Hoiho Recovery Plan shared by Ngā Rūnanga

While some whānau had seen the Hoiho Recovery Plan [prior to this stock-take] the majority had not. Notably, the plan does not specifically mention the role of Ngāi Tahu. It is seen as being important to ensure that Ngāi Tahu values are incorporated into the [new] plan.

Their limited knowledge of the plan did not deter Ngā Rūnanga participants in responding as to the use of a species recovery plan in general. Environmental kaitiaki representatives are well informed on the establishment and use of plans. Their comment is about the need to work with DOC on establishing and implementing the plans at a local Rūnanga and individual whānau level. However, the governance responsibility needs to be followed through [with both Treaty Partners represented] at the decision table.

3.5.2 Perspectives on species recovery plans and the existing Hoiho Recovery Plan shared by kaimahi

Some participants had used the Hoiho Recovery Plan prior to the stock-take. Some participants commented that the Hoiho Recovery Plan lends credibility to the work that they do and is particularly helpful in the context of applying for funding. For others, the stock-take was the first time they had become aware of the Plan's existence, had read the plan, or read the objectives and actions.

There was an understanding in general that a Species Recovery Plan is about ensuring the continued existence of a species; that it should be structured to provide clear objectives and that it should cater for management now while looking to the future. Some individuals articulated that recovery plans are a strategy for improving a species' conservation status.

There was widespread agreement that the Hoiho Recovery Programme needs to be guided by a revised strategy. Some participants commented that either the current plan or implementation of the current Hoiho Recovery Plan has not been effective as the species is in decline. There was a strong desire among many to ensure that any future plan allows for greater collaboration among 'the penguin community' to protect and manage this species.

Some participants added that a requirement for any future strategy is that the goals, objectives and actions be SMART (Specific, Measurable, Achievable, Results-focused and Time-bound).

3.6 DOC and Ngāi Tahu

3.6.1 Perspectives on the current relationship between DOC and Ngāi Tahu, and how this does or could relate to the kaitiakitanga/conservation of hoiho, shared by Ngā Rūnanga

Te Rūnanga o Ngāi Tahu affirmed their position with DOC as being that of Treaty Partner, not a stakeholder. They highlighted the importance of strengthening this relationship at the governance and leadership tiers; it is working well at some localised areas. An example of

shared governance would be DOC and Ngāi Tahu jointly advocating for the plight of the hoiho.

Rūnanga members want to be actively involved with the preservation and conservation management of this taonga species.

Whānau gave recognition to the work being done by civil society but noted that this acknowledgment does not allow or mean that DOC can contract out of its key Treaty obligations.

3.6.2 Perspectives on the current relationship between DOC and Ngāi Tahu, and how this does or could relate to the kaitiakitanga/conservation of hoiho, shared by kaimahi.

Participants held an appreciation that, for Ngāi Tahu, hoiho is a taonga species. Some expressed a good level of understanding about DOC's Section 4 responsibilities under the Conservation Act 1988 [14] and the Ngāi Tahu Claims Settlement Act 1998 [3] based on direct experience as a DOC employee or within other organisations/entities.

Some participants expressed an understanding of the Treaty Partner relationship between DOC and Ngāi Tahu gained through the process of seeking an Authority to work on Wildlife (i.e. a permit from DOC).

Kaimahi have sought to engage with whānau representatives on local projects, with mixed success. A range of experiences were reflected upon. Some strong local relationships exist between non-government entities and whānau, and DOC staff and whānau. Formal relationships between non-government entities and Te Rūnanga o Ngāi Tahu have not always been well defined and are consequently weak.

One participant expressed the view that the relationship between DOC and Ngāi Tahu has yet to yield meaningful dividends for long-term conservation of hoiho on the ground.

Part 4 Results & Recommendations- Ngā hua me ngā tūtohutanga

Review of Recovery Plan objectives and actions Te arotake o te Mahere whakaora me ngā mahi

Part 4 presents results from the stock-take and review of the current Hoiho Recovery Plan. In addition, the Stock-Take Team recommend nine key requirements of a future Hoiho Recovery strategy that are relevant to all of the findings and recommendations outlined in Part 4. We have opted not to re-state these for each objective but to present them as follows:

The development of the new hoiho recovery strategy must include:

- i) The perspectives of the Crown's Treaty Partner Te Rūnanga o Ngāi Tahu and Ngāi Tahu whānui. The incorporation and application of this perspective(s) is two-fold: legal obligation and tikanga (3.1, page 23; 3.5.1, page 27-28).
- ii) A component that specifically addresses the relationship Ngāi Tahu have with hoiho and their involvement in kaitiakitanga of hoiho (see also 3.1, page 23).
- iii) An inter-agency approach for addressing relevant issues in marine and terrestrial ecosystems with clearly identified accountabilities for the associated management actions. This is a priority for hoiho because:
 - a. the species occupies marine and terrestrial environments and is exposed to pressures within them;
 - b. the species is threatened;
 - c. the species' population(s) is/are known to be in a state of decline, or in the case of the Subantarctic populations there is insufficient information available to determine their status and trend.
- iv) Specialist technical and science knowledge and mātauranga from within the existing (hoiho) community which includes researchers, rehabilitation experts, veterinary specialists, revegetation experts and iwi (see also this report; 3.5.2, page 28).
- v) Coverage of issues and priorities throughout the full geographic range of the species.
- vi) Recognition that while the Subantarctic populations may be the stronghold of the species they are not an insurance population for the mainland population because they are a different genetic management unit to the mainland

population.

- vii) Objectives and actions that are SMART (Specific, Measurable, Achievable, Results-focused and Time-bound; see also this report; 3.5.2, page 28).
- viii) A structure based on common and related management themes to ensure it is succinct and avoids inconsistencies (e.g. combine terrestrial management objectives 2, 3, 4, and 5).
- ix) Strategic and effective communication and advocacy that sits alongside the mahi/work.
- x) Better sharing and dissemination of information.
- xi) High standards with regard to the scientific rigour of information. These are required for strategy development and ongoing recovery directed by the strategy.

4.1. Objective 1 *To obtain accurate population census and trend data from all parts of the hoiho range using approved survey and monitoring techniques.*

4.1.1 Action 1.1 *Ensure that all programmes meet minimum standards for scientific design and best-practice so that expectations will be met.*

Key findings (Action 1.1; Q8):

- Among Ngā Rūnanga, concern was held as to whether ‘minimum standards’ were sufficient for a threatened species.
- There is huge variance and no consistency in the methodology used across the habitats along the geographical range of hoiho.
- The design of survey and monitoring programmes need to be driven by the availability of meaningful management intervention (including māori management tools) and understanding the trigger thresholds for that management intervention.

The Stock-take Team concludes that (Action 1.1; Q8):

- Since 2000 some progress has been made toward fulfilling action 1.1 including work on mainland South Island, Whenua Hou/Codfish Island, and the YEP Trust-led work on Rakiura/ Stewart Island. This action has not been fulfilled to date for work on Auckland and Campbell Islands.
- Monitoring methods must be robust, repeatable, and site appropriate.

- The monitoring programme must provide meaningful and useable data.
- High standards for monitoring (methods, data management, analysis and reporting) should be adhered to for hoiho where there is appreciable risk to the species of basing management decisions on poor quality or inaccurate information.
- The application of best practice and tikanga is important.
- Information sharing throughout the season among kaimahi is important.

4.1.2 Action 1.2 *Initiate a full survey of the Auckland Islands Group to establish nest numbers.*

Key findings (Action 1.2; Q9):

- Progress against Action 1.2 has focused on gaining a better understanding of operational/logistical constraints on working with hoiho on Enderby Island and main Auckland Island.
- New research information is available about impacts of feral pigs, their ecology and control options on main Auckland Island [15].
- The importance of focused estimates (from nest monitoring) is becoming increasingly significant in the context of the Subantarctic populations due to:
 - The assumption that there is one population management unit for hoiho no longer holds. Genetic research in the past decade has confirmed the existence of two genetically and geographically distinct hoiho populations: the South Island (including Rakiura/Stewart Island and surrounding islands) and the Subantarctic, confirming that there is no significant migration of hoiho between the two [16,17,18,19].
 - The assumption that the Subantarctic population provides security for the species is unproven. At this time these populations are data deficient. Unregulated tourism presents a significant, unacceptable and unnecessary risk to the population on Enderby Island. Pigs and cats are likely to have significantly impacted on the hoiho population on main Auckland Island.
 - The effects of climate change on population health and viability throughout the species' range have yet to be quantified.
- There is also the observation that the effort in the Subantarctic Islands will never be the same as what can be achieved on the mainland.
- There was a call to focus resources on removing pigs from main Auckland Island rather than monitoring hoiho.

The Stock-take Team concludes that (Action 1.2; Q9):

- Achieving action 1.2 as currently stated is impracticable due to the level of effort that would be required to do it well.
- While the programme could certainly strive to get better quality information about the Subantarctic population it must be asked whether the investment required to undertake a full survey of the Auckland Islands group would provide the necessary return.
- Future monitoring and therefore management must be based on the fact that the Subantarctic population is not an insurance population for the mainland population.
- Population trends for Auckland, Campbell and Rakiura/Stewart Island cannot be inferred from mainland trends.

4.1.3 Action 1.3 *Repeat the 1990 survey by S. King on Stewart Island and extend it to complete coverage of Stewart Island to identify nest numbers.*

Key finding (Action 1.3; Q10):

- This work has been completed [20]; significantly fewer birds were recorded in this survey than originally estimated in 1990.
- Monitoring outcomes from studies of breeding success did not yield a definitive answer as to what the key mechanism of population decline is and therefore what management intervention is available and appropriate.

The Stock-take Team concludes that (Action 1.33; Q10):

- This action has been fulfilled. However, because the results were inconclusive in terms of identifying a key mechanism of population decline in hoiho on Rakiura/Stewart Island, there has been no management outcome (for the birds).

4.1.4 Action 1.4 *Develop a programme in association with relevant landowners to survey for hoiho on the islands surrounding Stewart Island.*

Key finding (Action 1.4; Q11):

- Limited progress with this action in 2000 with the Rakiura/Stewart Island hoiho survey work where access was given to some sites [21].
- A full survey has been undertaken on seven occasions for Whenua Hou/Codfish Island [22], once using the double-count method [23, 24] to test the accuracy of the single count method. Whenua Hou/Codfish Island is predator-free and yet hoiho numbers are declining. It is likely, therefore, that the same issues affecting birds on

Whenua Hou/Codfish Island are affecting the Tītī Islands populations and populations on the more northern islands in Foveaux Strait off Murihiku.

- Broadly speaking there are two whānau groups represented in Action 1.4.
 - Tītī islands whānau are too busy during the tītī season to monitor or survey hoiho [and the timing would not be comparable with other work undertaken during the hoiho breeding season]. Outside of this season, undertaking surveys would be reliant on the relationship DOC has with the individual land owners.
 - The islands off Murihiku (which are not Tītī islands) are also owned by whānau. Whānau are aware of the hoiho and do observe them but only from a distance. They do not want the birds disturbed.

The Stock-take Team concludes that (Action 1.4; Q11):

- It is critical to keep the flow of information coming to southern Rūnanga via Kaitiaki Roopu.
- The value of knowledge (to the conservation of hoiho) from surveying hoiho on the islands around Rakiura/Stewart Island and in Foveaux Strait off of Murihiku versus the risk of not knowing or being focused on a management response needs to be reassessed. Action 1.4 as it is currently stated may not sit well with Ngāi Tahu whānau given that some whānau adopt the ‘whānau concept’ for hoiho; their relationship with the penguin is from a distance and they want it to remain this way.

4.1.5 Action 1.5 *Maintain existing nest search programmes on the South Island to investigate population trends.*

Key findings (Action 1.5; Q12):

- No common view was shared among kaimahi about the objective’s purpose and the appropriateness of the existing nest search programme on the mainland.
- The number of people and organisations delivering this work has increased substantially since 2000 raising further issues around standardisation of methodologies.
- There is a strong desire for a consistent approach to estimating population numbers of this species and for written protocols.
- Science advice from some participants supports the need for a mark-recapture component at selected sites and continuation of the current long-term studies of marked birds.

- Many of the participants regard the current downward trend on the mainland as a pattern of continued decline that threatens the viability of hoiho on the mainland. This view was universally held by scientists with expertise in population modelling.

The Stock-take Team concludes that (Action 1.5; Q12):

- This action has been fulfilled. However, because management options, actions and triggers for intervention are not necessarily used to determine what/where/when baseline monitoring data for hoiho is required, the action is flawed.
- Expectations from researchers today are in excess of what the objective set out to achieve for management in 2000; tension exists between monitoring for the purpose of management and data collection for research purposes.

4.1.6 Action 1.6 *Maintain low intensity nest monitoring at Green Island Nature Reserve.*

Key findings (Action 1.6; Q13):

- A minimum estimate of nest numbers has been obtained with one visit per season for 8 out of the 9 seasons from 2006/07 to 2014/15.
- Numbers are stable but there have been changes observed in the way the birds are using the island, possibly due to nesting and burrowing of other bird species.
- Conflicting views were presented in regard to monitoring and research of the hoiho population at Green Island. Some people viewed this population an important control due to the absence of predators. Some people felt that no experimental work should be carried out with hoiho on Green Island while others felt the site/population could be a useful tool to trial new automated monitoring systems (e.g. transponders and automated recording systems).
- The Green Island hoiho data has not been presented anywhere recently as a comparison (e.g. a control) with mainland Otago which raises the question about the value of this monitoring.

The Stock-take Team concludes that (Action 1.6; Q13):

- This action has been fulfilled, however the term low-level monitoring and the purpose is undefined for this action.
- We question the value of maintaining monitoring in its current form if the data is inadequate or is not going to be used in a meaningful way.

- Green Island may hold potential as a predator-free control site but its utility needs to be evaluated.

Schematic summary of the current state of progress against Objective 1 (Actions) by geographic region of hoiho, as reported by contributors

Location	Action 1 Min. stds met	Action 2 Full survey/Ak Is	Action 3 1990s survey/SI	Action 4 Titi Islands	Action 5 Nest search/Pop ^a	Action 6 Green Island
Banks Peninsula	Yes	n/a	n/a	n/a	← Objective out of date →	n/a
North Otago	Yes	n/a	n/a	n/a		n/a
Otago Peninsula	Yes	n/a	n/a	n/a		Need to analyse data to justify contribution
Catlins - North	Yes	n/a	n/a	n/a	n/a	n/a
Catlins - South	Yes	n/a	n/a	n/a	n/a	n/a
Southland	Yes	n/a	n/a	n/a	n/a	n/a
Rakiura / Stewart Island	Yes	n/a	Complete	Incomplete	n/a	n/a
Subantarctic – Campbell Island	High / Historic / Dated	n/a	n/a	n/a	n/a	n/a
Subantarctic – Auckland Island (Main)	Low / Significant gaps	Agreed remains priority Resource intensive Predator control vs/yep monitoring	n/a	n/a	n/a	n/a
Subantarctic Enderby Island	Low / Significant gaps	Priority resource intensive	n/a	n/a	n/a	n/a

4.1.7 Overarching themes from Objective 1

A schematic summary of the current state of progress against Objective 1 (Actions) by geographic region of hoiho, as reported by contributors, is presented on page 37.

- a) Actions under Objective 1 represent a large proportion of effort and resources within the conservation effort for hoiho.
- b) The actions themselves do not provide a sufficient basis for achieving the objective without co-ordination and correlation of surveys and analysis of results. The programme needs to be clearer about what monitoring is done, why it is done, and how the information relates to management actions.
- c) Serious concern was held by a number of participants that the decline of several populations continues to be monitored year after year with no management intervention.
- d) Terminology is confused: ‘census’ and ‘survey’ have been used interchangeably.

4.1.8 Additional comments from Stock-take Team regarding Objective 1

- Objective 1 is not SMART.
- Obtaining a census figure for a species as a whole is typically very expensive. It only provides meaningful trend data if it can be repeated at regular intervals over a long period of time. Therefore census figures are not particularly useful in the context of making real-time management decisions. They do have merit in allowing for estimates of threat classification and are used frequently for advocacy purposes. Currently the Hoiho Recovery Programme relies on incomplete census data and trend data from some sites. Objective 1 has two drivers (census data = threat status and advocacy, and trend data = monitoring for management) that may benefit from being split apart in the new strategy.
- Ngā Rūnanga had very little direct involvement with actions under Objective 1, suggesting a greater need for their participation.
- The multiplicity of sites engenders a sense of ownership of populations; consequently the Hoiho Recovery Programme has struggled to develop consistency.
- Monitoring is largely disconnected from management intervention which provides further explanation as to why the monitoring component of the Hoiho Recovery Programme as it currently stands does not work as well as it should.
- Traditionally the Nuggets, Penguin Bay, Ōwaka Heads and Long Point were the sites where annual monitoring in the Catlins was undertaken. For many years Te Rere had no monitoring whatsoever and now generally has only one nest visit

each season.

4.1.9 Recommendations from Objective 1 for Stage 2

(Summary of Recommendations 7)

- i) Establish an adaptive management framework for the Hoiho Recovery Programme. This approach will require a strategy that supports:
 - a. Identification of key questions and hypotheses for informing management of hoiho for each population management unit.
 - b. Identification of key baseline monitoring data required to address key questions and hypotheses in order to inform ongoing hoiho management, including the management actions, frequency and intensity necessary.
 - c. Development of best practice guidelines/tikanga for baseline monitoring that meets these requirements, both within-season and the over long term, particularly for the mainland populations, to guide the wider conservation effort.
 - d. Establishment of minimum acceptable management thresholds of success/failure of management.
 - e. Preparation of contingencies in the event that chosen management options fail.
- ii) Assess the value of long-term population trend data for the future recovery of hoiho and what the ongoing mark-recapture component from representative sites for hoiho should be.
- iii) Account for the diversity of sites and groups undertaking monitoring and develop protocols with those involved to support Recommendation 7(i).
- iv) Ensure that data collection for research purposes over and above baseline monitoring meets scientific design principles.
- v) Be strategic about what and where research information is collected by better aligning research programmes with baseline monitoring.
- vi) Ensure wider research on hoiho complements baseline monitoring or at the very minimum does not compromise local or regional monitoring programmes.
- vii) Establish the key drivers for obtaining population estimates for hoiho and link these to actions within the new Hoiho Recovery Strategy. Where it is necessary to estimate population numbers do so at the appropriate management level—not for the species as a whole. [Note: This recommendation has implications for how the programme reports on the national status and population trend for hoiho].
- viii) Investigate the use of ‘new tools’ to assist with monitoring where appropriate.

4.2. Objective 2 *To manage terrestrial habitat primarily for hoiho.*

4.2.1 Action 2.1 *Advocate for hoiho habitats to be destocked.*

Key findings (Action 2.1; Q15):

- Many hoiho habitats are now fully destocked. Exceptions include sheep grazing on Banks Peninsula, unfenced land on the peninsula at Kātiki Point (excluding the Wildlife Management Reserve), parts of Long Point, Cosgrove Creek, Waianakarua Bluffs and Kaikai Beach.
- DOC has not been the primary advocate for Action 2.1. For example, the YEP Trust have led this work for YEP Trust-owned-and-managed reserves in Otago, and Southland Branch of Forest and Bird have done so for Te Rere. Since the early-to-mid 2000s the YEP Trust's approach to terrestrial management of hoiho sites has shifted towards one that is more pragmatic.

The Stock-take Team concludes that (Action 2.1; Q15):

- Action 2.1 is fulfilled. However, the Hoiho Recovery Plan is not explicit about the purpose/s of destocking under Objective 2. Is it about disturbance by stock, access to nesting areas, revegetation, or all of the above?
- It is conceivable given the suite of pressures faced by the species in the past 15 years that hoiho populations may have been even smaller today or non-existent at sites were they not destocked with subsequent management of vegetation. We do not know the answer to this question.
- Land managers have made decisions that meet their local needs.
- There are examples where limited grazing by sheep has been seen as useful i.e. in remote sites with no ongoing vegetation management or as part of a progression toward low-level grazing or de-stocking and revegetation over a number of years (e.g. Penguin Place/Pipikaretu, Otago Peninsula). See also [25].
- The climatic differences from Canterbury to the Catlins mean that the impact of stock on the habitat at these sites is different. A one-size-fits-all approach to grazing across the climatic range of hoiho on the mainland may not be appropriate in the future.
- Managing of boundary fences is an ongoing issue. This aspect needs attention in a new strategy.

4.2.2 Action 2.2 *Assess options for alternative land-use strategies, including limited grazing, or hoiho habitat in terms of the contribution made to long-term sustainable management.*

Key findings (Action 2.2; Q16):

- There is one published assessment of habitat preference for hoiho with respect to grazed versus no-grazed habitat. McKay *et al.* [25] found that hoiho selected nest sites in grazed pasture in preference to shrub land at Papanui Beach on the Otago Peninsula.
- Busch and Cullen [26] derived an economic model that used hoiho nest count data to compare the efficacy and cost-effectiveness of three management techniques: revegetation, trapping of introduced predators, and intensive management⁸. They reported that intensive management only was significantly correlated with increases in annual site-level yellow-eyed penguin population growth rate.
- Monitoring of hoiho at Penguin Place/Pipikaretu indicated that a regime of mixed grazing and fenced enclosure planting was as effective as a revegetation programme that fully excluded grazing stock⁹.
- Many perspectives were shared as to whether limited grazing was beneficial or not to hoiho including:
 - Limited grazing benefits hoiho by keeping access open through rank grass.
 - It disadvantages hoiho (and ecological associates) by retarding habitat progression towards canopy closure. The longer-term goal is the more important.
 - It is in grazed habitats that we have recorded the highest levels of predation.

The Stock-take Team concludes that (Action 2.2; Q16):

- Action 2.2 has been fulfilled. Refer to concluding comments for Action 2.1; Q15 and 4.2.3 - Overarching themes from Objective 2 - for further discussion.

⁸ Busch and Cullen [26] define intensive management as: regularly checking the status of individual penguins; providing sick penguins with antibiotics, injured penguins with medical care, and underweight penguins with food supplements; enhancing trapping by placing traps near nests and monitoring these traps more frequently; use of/maintaining nest boxes; enhancing revegetation efforts by ensuring that trees are cared for once planted.

⁹ Pipikaretu was permanently de-stocked in 2011/12

4.2.3 Overarching themes from Objective 2

- a) A significant (based on the amount of nesting pairs) number of habitats have changed landownership in the last 15 years – public/NGO ownership versus private ownership is a primary point of divergence in the way the habitat is being managed.
- b) There was a consensus view that grazing cattle is inappropriate in hoiho habitats.
- c) Some participants held the view that limited sheep grazing to provide access in nesting areas for hoiho or controlling weeds is appropriate, particularly where these sites are infrequently visited and manual control of long grass is not an option. Some participants strongly argued that restoring habitat for hoiho (see Objective 4, page 45) in the presence of grazing in any form is unrealistic and that it is not ideal or prudent to manage arbitrarily reduced and threatened populations in habitats which are compromised.
- d) Divergent opinion remains as to whether long grass is a problem for penguins in terms of access to breeding areas.
- e) Coastal revegetation effort following de-stocking has not resulted in local increases in hoiho nesting numbers in Otago and Southland, although it may account for why birds are still present (albeit with the number of nesting pairs declining).
- f) Not all of the available scientific information and recommendations were taken into consideration with respect to this objective when the last Hoiho Recovery Plan was written.
- g) On the mainland relict sub-populations of hoiho are nesting in a variety of habitat types and remnants of what was once contiguous coastal forest habitat. Site-based studies have given us an indication of nesting habitat preferences for hoiho on a micro-scale (e.g. McKay et al. [19] demonstrated that hoiho are able to nest and fledge chicks even in highly modified pasture habitat). There has, however, been no wider assessment of the importance of specific nesting habitats to breeding success for hoiho.
- h) Some whānau felt little progress had been made on Objective 2 but that they are/would be very supportive of initiatives to de-stock hoiho breeding areas providing it could be resourced and that hoiho would continue (or could be encouraged) to use the de-stocked areas for breeding: “People do what money lets them do. If there was more money.....we could go into resourcing to care for the hoiho”.

- i) Some also commented on the value of the monitoring and science from Penguin Place (Ōtākou whānau) and the experience of hoiho co-existing with sheep (Ōnuku whānau).
- j) Many sites are not managed exclusively for hoiho as there are other values present.

4.2.4 Additional comments from Stock-take Team regarding Objective 2

- Breeding habitat preferences of hoiho and the outcome of de-stocking to breeding habitat use and breeding outcomes may still be important research questions for some sites.
- Ultimately there is a need to create and manage habitats that support the ongoing viability of hoiho. In the medium-to-long-term it is preferable that hoiho can persist in these habitats largely unassisted.

4.2.5 Recommendations from Objective 2 for Stage 2

(Summary of Recommendations 8)

- i) Incorporate land use practices into a broader terrestrial land management objective for hoiho conservation; the need for a specific objective regarding de-stocking has passed.
- ii) Advocate for a variety of terrestrial habitat management tools that can be applied locally to different sites including de-stocking (but not necessarily of sheep at every site).
- iii) Enable the exclusion of cattle and pigs from all sites.
- iv) Identify what, if any, management approaches can be put in place to ensure nesting areas remain accessible to penguins where access has become severely restricted due to coastal erosion. Assess the likely long-term viability of these sites if hoiho access management is implemented.
- v) Develop better advocacy and engagement tools for the purpose of establishing and maintaining successful relationships with landowners for the benefit of hoiho conservation.

4.3. Objective 3: *To protect areas of habitat for hoiho to allow for an increase in population.*

4.3.1 Recovery Plan Action 3.1

In assessing reserve proposals:

- a) *They should be of sufficient size to protect against local extinction;*
- b) *Priority should be given to ensuring that hoiho habitats close together are protected to form a nucleus of closely linked habitats.*

Objective 3 has only one action. Therefore ‘Key findings’ and ‘Conclusions by action’ are included in 4.3.2, 4.3.3 and 4.3.4 below.

4.3.2 Overarching themes from Objective 3

- a) Objective 3 relates only to the mainland part of the species range.
- b) Objective 3 has the potential to be a distraction from better management of land, predator control and/or better management of tourism for hoiho.
- c) Establishment of protected areas for hoiho is less relevant now; what is more relevant is better enabling the large number of people/kamahi and organisations to manage the species, habitat and predators across the bird’s geographic range.
- d) Ngā Rūnanga support the intention of Objective 3 and Action 3.1 but stated that reserves need to be adequately resourced to be well-managed for hoiho and other species.
- e) Breeding colonies are vulnerable to localised extinction irrespective of reserve size.
- f) Every breeding pair and potentially every nesting site are important. It is more difficult to establish a colony from no pairs than it is from one or two pairs.
- g) When considering land protection it is difficult to predict how hoiho will use the available habitat and therefore plan a reserve based on current and future needs of the species at a particular site.
- h) Public Conservation Land with nesting hoiho is managed for multiple objectives, some of which are in conflict with Objective 3.
- i) Habitat acquisition has largely been reactive to opportunities that arise.

4.3.3 Additional comments from Stock-take Team on Objective 3

- Objective 3 is no longer useful as a stand-alone objective. Examples exist of where Action 3.1 has been achieved and where it has not in the process of establishing terrestrial protected areas for hoiho conservation.
- This objective came out of an operational focus and was about ensuring the programme did not end up with a large number of pocket-sized reserves to

manage. There is no clear demonstration of the relationship between the minimum recommended reserve size of 25 ha¹⁰ and what this means for hoiho.

- When it was written there was an expectation that additional large areas would come under protection (e.g. Long Point).
- Although not stated explicitly this objective is focused on mainland breeding sites and doesn't take into account island populations.
- Respondents have questioned DOC's ability to manage Public Conservation Land for hoiho.
- These comments point to the difficulties in designing reserves within a large geographic area range with a multiplicity of different issues locally.

4.3.4 Recommendations from Objective 3 for Stage 2

(Summary of Recommendations 9)

- i) Give more attention to how the land is managed in the context of hoiho conservation rather than the size of the protected area.
- ii) DOC to consider changes in land classification at some sites to prioritise for hoiho conservation on public conservation land over other conservation land users.

4.4 Objective 4: *To improve habitats for hoiho by re-vegetation and other strategies.*

4.4.1 Recovery Plan Action 4.1 *Continue to develop re-vegetation techniques and ensure that this information is available to other groups who wish to embark on re-vegetation projects.*

Key findings (Action 4.1; Q20):

- The role of planting has changed considerably in the past 15 years. Early efforts were not always successful. Considerable learning has accrued along the way.
- Revegetation projects with multiple objectives have been undertaken and managed by many community groups, particularly in North Otago and on the Otago Peninsula.
- The YEP Trust have provided leadership, advocacy and expertise to other groups in coastal re-vegetation techniques. They produced the booklet 'From Field to Forest - A guide to revegetation southern coastlines' published in 2009 [27].

¹⁰ From: Hoiho Recovery Plan 2000-2025, page 17. "Protected areas greater than 25 ha are preferred because they have a higher robustness against local extinction. Smaller areas are still important as parts of an overall network of protected areas."

- The principles of re-vegetation are supported by Ngā Rūnanga and whānau. Application of Mātauranga at the local level is very important; there are many local solutions and people will want or need to do different things at different sites. Education is important.
- Some groups strictly adhere to eco-sourcing for plantings as part of a broader coastal restoration programme; others are more focused on habitat management specifically for hoiho and dune erosion and some of these groups do not use eco-sourcing.
- From an eco-junk and wildlife health/disease perspective, greater consideration ought to be given to the materials being put out into the natural environment.

The Stock-take Team concludes that (Action 4.1; Q20):

- Action 4.1 has been fulfilled.
- Not all coastal revegetation work done by the groups/individuals we spoke to is primarily for hoiho. Some projects have different or broader objectives.
- There is inconsistent application of sound eco-sourcing protocols.

4.4.2 Recovery Plan Action 4.2 *Ensure that an appropriate plan is available before embarking on a re-vegetation project and that matters such as progressive change in species numbers are catered for.*

Key findings (Action 4.2; Q21):

- Many people reported that they do use planting plans; these are continually evolving.
- Some information relating to revegetation in hoiho habitats has been reported in peer-reviewed science papers [e.g. 26, 27] and field guides [25].

The Stock-take Team concludes that (Action 4.2; Q21):

- Action 4.2 has been partially fulfilled.
- In spite of considerable information sharing there is still confusion about the different re-vegetation/advocacy objectives that groups have and how these specifically relate to hoiho recovery.

4.4.3 Overarching themes from Objective 4

- a) Coastal revegetation effort in Otago and Southland in the past 15 years has been significant. This effort has yielded positive results in conservation advocacy, developing coastal revegetation techniques, restoration of habitat and erosion

management.

- b) Conservation advocacy generated by engaging the wider community in revegetation work may not necessarily be about hoiho or of direct benefit to hoiho.
- c) Cover can be provided for nesting penguins within approximately 10 years.
- d) Planting effort is not solely driven by the needs of hoiho but by other objectives; coastal revegetation projects have broad intrinsic value and support the recovery of numerous threatened and/or uncommon species. Rūnanga support this holistic approach to coastal restoration.
- e) The primary focus of Objective 4 is based on a view that coastal forest is the preferred breeding habitat of hoiho and that heat stress, a consequence of deforestation, may cause nesting failure and mortality in hoiho (reviewed in [7]). Some science opinion does not support the view that coastal forest is their preferred habitat [25] or that re-vegetation in the absence of intensive management of birds is cost-effect and assisting with the species' recovery [26].
- f) There is a view that prioritising management of sites for coastal re-vegetation over direct and intensive management of the birds has compromised recovery of the species.
- g) The effectiveness of re-vegetation efforts for hoiho recovery are not being measured.
- h) Stocking regimes and browse impacts by introduced pests on plantings have driven the techniques used at different sites and in different regions. Rabbits are dominant in North Otago and possums and hares in the Catlins.
- i) More effort needs to be made to control and/or eradicate pest-plants as part of restoration planning and delivery. This view was shared by Ngā Rūnanga as well as some members of kaimahi.
- j) The biggest challenge in re-vegetation projects is resourcing the ongoing maintenance of plantings while they become established.

4.4.4 Additional comments from Stock-take Team on Objective 4

- The separation of terrestrial management objectives (2, 3, 4 and 5) within the Hoiho Recovery Plan reflected the concern of the day. Greater confidence exists today as to how these components can be integrated within a new strategy for hoiho.
- The Recovery Plan implies that coastal forest is the preferred habitat of hoiho. We heard different views/knowledge about what the preferred or 'natural' habitat of hoiho is. Some knowledge was based on peer-reviewed science papers.

- We can see a logical progression of learning/techniques being applied.
- There was considerable reporting of revegetation efforts by a wide range of people including work undertaken prior to 2000 which is not detailed in this report.

4.4.5 Recommendations from Objective 4 for Stage 2

(Summary of Recommendations 10)

- i) Ensure that revegetation and restoration objectives and actions contained within a specific strategy for hoiho are measurable in terms of hoiho recovery either directly (e.g. through increased numbers of pairs and their breeding success) or indirectly (via advocacy which results in measureable benefits to hoiho conservation).
- ii) Apply current best practice to revegetation objectives and actions if retained within a future strategy including:
 - a. seed-sourcing
 - b. ongoing maintenance of plantings
 - c. project plans
 - d. removal of eco-junk.

4.5 Objective 5: *To protect hoiho chicks from predators and ensure that the most cost-effective methods are utilised.*

4.5.1 Recovery Plan Action 5.1 *Protect 50% of all South Island nests from predators focusing on a range of key locations.*

Key findings (Action 5.1; Q23):

- The target of 50% is “confusing” and and/or far too low. This view was shared universally among participants.
- Unlike other threats to hoiho, mitigating the effects of terrestrial predation on hoiho populations is well understood, straightforward to implement and should be put in place wherever possible.
- The value and effectiveness of current predator control programmes to protect hoiho is not being assessed at all sites.
- Ngā Rūnanga made the specific comment about the importance of monitoring outcomes of predator control and making this information available.

- Predator control for hoiho and coastal reserve management is largely under resourced. It relies heavily on volunteers. There is a lack of oversight and coordination.

Schematic summary of the presence/absence of key hoiho predators by geographic region, as reported by contributors					
Location	Mustelids	Cats	Pigs	Rats	Predator Control
Banks Peninsula	Ferrets / Stoats	√	X	√	Yes, reported as effective
North Otago	Ferrets / Stoats	√	Shag Point	√	Yes, at some sites
Otago Peninsula	Ferrets / Stoats	√	X	√	Yes, at most sites
Catlins - North	Ferrets / Stoats	√	√	√	Yes
	Stoats	√	X	√	Only some sites
Catlins - South					
Southland	Stoats	√	X	√	Curio Bay
Rakiura / Stewart Island	X	√	X	√	No
Subantarctic – Campbell Island	X	X	X	X	N/A
Subantarctic – Auckland Islands	X	√ (only on main island)	√ (only on main island)	X	No

The Stock-take Team concludes that (Action 5.1; Q23):

- Conservation effort on hoiho has fulfilled and exceeded action 5.1, although not necessarily cost-efficiently or effectively in terms of trapping quality.
- Predator control (infrastructure, delivery, oversight, data curation, analysis and reporting) is under-resourced.
- While the target of 50% may have been exceeded for Action 5.1 it is not possible to determine how effective it is at many sites because monitoring effort of hoiho is too infrequent to detect predation of chicks (it would be a chance occurrence to recover a freshly killed chick) and predator densities are inferred from trap-catch data.
- Some private groups are doing a thorough job of curating and evaluating the data against breeding success for hoiho.
- There is no over-arching adaptive-management approach (or culture of continued improvement) to predator control for hoiho. The value of relating trapping data to hoiho breeding outcomes has not been maximised.
- Ensuring on-going quality of all control operations is a key gap.
- Volunteers will not have confidence in the quality of their trapping operations or be able to improve them if they do not get feedback about hoiho nesting outcomes from appropriate monitoring programmes.

4.5.2 Recovery Plan Action 5.2 *Continue to examine options for predator management in consultation with other workers who are developing predator control strategies and disseminate those results.*

Key findings (Action 5.2; Q24):

- The importance of predator control for hoiho and the existing work that is being done by groups is not being communicated to all Rūnanga groups. Not all Rūnanga have visibility over predator control that is in place or there is no predator control at these sites.
- Barriers to adopting even current best practice as well as considering ‘new tools’ need to be identified and removed.
- There is a question of how to resource and build the willingness of those undertaking predator control to update their skills and the hardware. There is an expectation that DOC leadership is going to be part of this.
- The YEP Trust has provided leadership, training and information to other groups undertaking predator control. They published a field guide to mustelid trapping [28] which has been disseminated nationally. It was reprinted in 2005 and is now out of date with respect to current best practice.

The Stock-take Team concludes that (Action 5.2; Q24):

- Action 5.2 has been fulfilled since 2000 but is not currently being achieved for all sites.

4.5.3 Recovery Plan Action 5.3 *Participate in trials and other work to develop predator control strategies which are tailored to meet the needs of hoiho, and which increase efficiencies without reducing effectiveness.*

Key finding (Action 5.3; Q25):

- There is a high expectation that new tools will be available soon however current best practice is still not being met for all operations and current tools are not being used or made available where they could be (e.g. DOC 200™ series traps, predator dogs, toxins).

The Stock-take Team concludes that (Action 5.3; Q25):

- Action 5.3 is not currently being fulfilled.

- Considerable improvements to hardware and their application have been amassed in the past 10 years yet these do not appear to have translated to changes in predator control techniques for hoiho at a number of sites.
- There is a keenness to do this work if required; funding and agency leadership is essential. As part of any rollout of new traps the community will need workshops and funds to buy new traps.
- There was more feedback on trapping as a community-based project than revegetation.

4.5.4 Overarching themes from Objective 5

- a) Predator control is a fundamental part of species recovery for hoiho on land. Objective 5 is still relevant to hoiho conservation. It is delivering multi-species benefits.
- b) Objective 5 only applies to the South Island population, not the entire geographic distribution of hoiho.
- c) Objective 5 only refers to chicks, not adult hoiho.
- d) Rūnanga/ whānau expect to work on the ground with DOC to deliver agreed outputs for pest control.
- e) The community needs a high input of funding to upgrade existing tools to meet current best practice standards and to continue this work strategically with the appropriate agency to manage it and provide linkages with national programmes for predator/pest control and eradication.
- f) Although outside this objective:
 - the impact of pigs on hoiho was raised in regard to Auckland Island and the Catlins; and
 - marine predation threats are not addressed in the present strategy.

4.5.5 Additional comments from Stock-take Team on Objective 5

- The programme is in a much better state in regard to predator control for the protection of hoiho than in the late 1970s.
- In the current and future context predator and pest control needs to be landscape-based and ecosystem-focused. This approach will be more cost-effective and deliver the best outcomes for land management and range of fauna. It is no longer about protecting or controlling a single-species.
- Hoiho are now confronted by other threats that are significantly less well understood than terrestrial predators. The Hoiho Recovery Programme should

be doing everything possible to support the mitigation of terrestrial predation on hoiho because this is a pressure that is most easily managed effectively.

- In future there needs to be better linkages between DOC's national threats programmes and predator/pest control for hoiho.
- Feedback on the effectiveness of predator control on Rakiura/Stewart Island was limited. A lack of a clear demonstrable impact during the last research investigation was reflected in the lack of commentary. Feedback on the impact of pigs on Auckland Is was a lot clearer in terms of a priority action.

4.5.6 Recommendations from Objective 5 for Stage 2

(Summary of Recommendations 11)

- i) Include terrestrial predator control as a conservation management tool for hoiho.

The priorities for future predator-focused work are to:

 - a. eradicate pigs on main Auckland Island
 - b. control pigs on the mainland
 - c. investigate the significance of cats as an agent of decline on main Auckland Island
 - d. on the mainland, work at an ecological scale that reflects the predator/s biology
 - e. improve the effectiveness of existing trapping networks at South Island hoiho management sites
 - f. further investigation of the significance of cats as an agent of decline on Rakiura/Stewart Island
- ii) Consider what scope there is to address marine predation threats in the context of applied management. If management options are available evaluate the extent to which marine predators (i.e. barracuda) are a significant agent of decline for hoiho.
- iii) Require and support the application by kaimahi of current best practice for predator control, maintaining efficacy and the use of 'new tools' where appropriate.

4.6 Objective 6 *To identify the proportion of adult and juvenile mortality resulting from fishing activity and develop strategies to reduce this.*

4.6.1 Recovery Plan Action 6.1 *Advocate for appropriate research to be undertaken to quantify the impact of commercial and recreational fishing gear on hoiho.*

Key findings (Action 6.1; Q26):

- Data is available but this information has not been used to estimate fisheries by-catch of hoiho.
- There is a desire from Rūnanga to know how to prevent accidental death of hoiho by fishing gear. They want to see change now rather than further research.
- A new strategy for hoiho must quantify fisheries by-catch on the basis of currently available information rather than recommending ‘more research’.

The Stock-take Team concludes that (Action 6.11; Q26):

- Action 6.2 has been partially fulfilled. The action doesn’t specify with respect to ‘direct’ or ‘indirect’ impacts – the intention at the time the Recovery Plan was written was with respect to direct impacts.
- Comments by Ngā Rūnanga related to the depletion of fish for hoiho (indirect) and concern about the danger of the fishing gear to hoiho (direct). Comments were not based on scientific research. However, participants advocated for change, not research (except in the case of impacts on the benthic environment).

4.6.2 Recovery Plan Action 6.2 *Continue liaison with fisheries managers to reduce the impact of fishing operations on hoiho.*

Key findings (Action 6.2; Q27):

- There was praise for Sharing Worlds - Seabirds and Fishing, a DVD produced by Southern Seabird Solutions in partnership with the YEP Trust and supported by a number of businesses and NGOs¹¹.

The Stock-take Team conclude that (Action 6.2; Q27):

¹¹ Port Chalmers Fisherman’s Co-operative; Yellow-eyed Penguin Trust; Elm Wildlife Tours; Community Trust of Southland; Otago Community Trust; Otago Peninsula Trust; Ngāi Tahu Seafood; NZ Federation of Commercial Fisherman; Southern Inshore Fisheries; Harbour Fish and DOC.

- Action 6.2 has been partially fulfilled. Outcomes for hoiho recovery have not been measured.

4.6.3 Recovery Plan Action 6.3 *Participate in relevant forums to ensure that fisheries managers and industry are aware of the impact of the fishing industry on hoiho.*

Key findings (Action 6.3; Q28):

- Hoiho are now included in the Ministry of Primary Industries Risk Assessment Framework (research plan and national plan of action for seabirds) which means hoiho are a species that the fishing industry must take into account. This should contribute to an increase in observer presence in inshore fisheries in the south east of the South Island. Outcome for hoiho at this time is unknown.
- There was support for continued engagement in the Conservation Services Programme process – regional perspectives are important.
- There was recognition that investment in forums should be balanced against action. Engagement in fisheries forums was acknowledged as difficult. There was an expectation that the process will work better in future because a lot more planning and strategic work has been completed. Now guided by the Ministry of Primary Industries Risk Assessment Framework.
- There is joint participation by Ngāi Tahu and DOC in discussions about fisheries and marine ecosystems.

The Stock-take Team concludes that (Action 6.3; Q28):

- Action 6.3 has been partially fulfilled.

4.6.4 Recovery Plan Action 6.4 *Continue to gather and collate information about hoiho caught in fishing gear.*

Key findings (Action 6.4; Q29):

- The ongoing need to collect good data to feed into national priorities; most solutions will be developed at a regional level and be face-to-face.
- Expectation, albeit cautionary, that problems with the current observer programme will be overcome through rapid advances in technology and the use of extensive electronic monitoring within the next 3-5 years.

The Stock-take Team conclude that (Action 6.4; Q29):

- Action 6.4 has been partially fulfilled but nothing has been done with recent data in order to achieve Objective 6.

4.6.5 Recovery Plan Action 6.5 *Implement the results of such research to reduce the impact of fishing gear on hoiho.*

Key finding (Action 6.5; Q30):

- This action is still highly relevant. Avenues exist for potential mitigation that should be explored now.

The Stock-take Team concludes that (Action 6.5; Q30):

- Not specifically undertaken for hoiho. Mitigation tools and practices have been adopted for other species.
- Notably the key driver for all of the marine protected areas referred to was dolphins, not hoiho.

4.6.6 Overarching themes from Objective 6

- For some Rūnanga knowledge of fishing and the fishing community extends back 40 + years. Generally attitudes towards hoiho by fishers have changed in this time; hoiho are not being blamed for the reduction in fish stocks (i.e. competing with fishers). There is greater awareness about the impacts of fishing gear on hoiho and about their threat status.
- Universal concern expressed about the loss of any adult hoiho to fisheries bycatch and the significance of losing breeding adult penguins from a small and dwindling population.
- A call to do something tangible now; the current marine protection tools are insufficient to protect hoiho at sea. There was promotion of a ban on set nets over the entire continental shelf.
- Recognition needs to be given to the use of Māori management tools such as Rāhui.
- Improved relationships and an inter-agency approach is required to ensure DOC and Ministry of Primary Industries work effective together in terms of fulfilling their respective legislative responsibilities.
- The argument for fisheries management may become stronger if impacts of

<p>the activity are demonstrated across a range of threatened species.</p> <p>g) The new strategy needs to be more explicit about objectives and actions relating to marine threats.</p> <p>h) Acknowledgement that knowledge of the ecology of hoiho has increased, which has clarified some of the risks, but that foraging ecology studies of hoiho to date provides only limited information. There has been no coherent, long-term study which supports the detection of correlations between penguin foraging, mortality and fisheries by-catch data. This is why the observer programme is so important.</p> <p>i) Deep concern was expressed in regard to other impacts on the marine environment including dairy effluent discharge, indirect fishery impacts (i.e. on the food supply for Hoiho) and the benthic environment (see Objective 9).</p> <p>j) There are other indicators that the marine food chain is in a sub-optimal state (e.g. tītī breeding success¹²).</p> <p>k) South East Marine Protection Forum is an example of where input from the Hoiho Recovery Programme should be made.</p>
<p>4.6.7 Additional comments from Stock-take Team on Objective 6</p>
<p>None</p>
<p>4.6.8 Recommendations from Objective 6 for Stage 2 (Summary of Recommendations 12)</p>
<p>i) Quantify fisheries by-catch of hoiho on the basis of currently available information. Include this estimate in the new strategy.</p> <p>ii) Use this data to advise on improving the observer programme in order to reduce the Confidence Interval and obtain a more accurate and precise estimate.</p> <p>iii) Outline a series of marine protection measures to prevent fisheries by-catch of hoiho. These measures need to be big enough to result in a biologically meaningful improvement for hoiho (not just a statistically significant one) with the objective of reducing bycatch of hoiho to a biologically sustainable level.</p> <p>iv) Establish an inter-agency approach that fosters co-leadership among government agencies (i.e. between DOC and Ministry of Primary</p>

¹² Tītī are classified as declining in the NZTCS. The criteria are that they have a very large population and low-to-high ongoing or predicted decline. They are noted as secure overseas.

- Industries), in partnership with Ngāi Tahu, and linkages to other programmes and forums at the eco-system level (e.g. marine mammal protection; South-East Marine Protection Planning Forum/Roopu Manaaki ki te Toka).
- v) Use this interagency approach to support productive liaison with the fishing industry via an appropriate forum/s.
 - vi) Endorse regional input into relevant marine forums (e.g. marine protection forums and fisheries) but not at the expense of direct action toward mitigating threats to hoiho at sea.
 - vii) Include direct and indirect threats to hoiho at sea; be specific about what marine-based research is necessary to inform hoiho recovery priorities and actions.
 - viii) Consider the full range of tools in the management kete including the application of Māori management tools such as rāhui.

4.7 Objective 7 Ensure continued public support for hoiho conservation by maintaining existing consultative structures and developing new advocacy initiatives.

4.7.1 Recovery Plan Action 7.1 Develop a strategy for measuring the effectiveness of advocacy activities.

Key findings (Action 7.1; Q33):

- There is no strategy and most advocacy initiatives are not being measured in terms of tangible outcomes for hoiho recovery.
- In the South Canterbury section of the hoiho takiwā (which includes Waihao and Arowhenua) little is known by Rūnanga and the general public about the plight of the hoiho. Rūnanga feel that public knowledge and education, including in schools, on hoiho is lacking and that more knowledge would lead to greater support for their protection.
- The programme is not using appropriate social science strategies to see what initiatives will result in changes in human behaviour that benefit hoiho.

The Stock-Take Team concludes that (Action 7.1; Q33):

- Action 7.1 has not been fulfilled.

- There is recognition that the messaging is complex and that advocacy has been too reactive; Community Based Social Marketing would be a valuable approach to adopt.
- Advocacy has been traditionally viewed as Public Relations. This definition is no longer valid as it does not specifically aim to include: policy and decision makers, co-workers, industry among others.

4.7.2 Recovery Plan Action 7.2 *Maintain the Hoiho Consultative Group as a key conduit for disseminating information to interested groups and members of the public through regular meetings.*

Key finding (Action 7.2; Q34):

- A wide-range of support was extended for different engagement forums within the programme; more so the Annual Symposium which is the only forum still running.

The Stock-Take Team concludes that (Action 7.2; Q34):

- Action 7.2 is not currently being fulfilled.
- The Consultative Group were responsible for organising the Annual Symposium and this responsibility has now fallen to DOC and the YEP Trust.
- Different forums have different purposes and are appropriate to maintain for these different reasons.
- People have different expectations about the purpose of different engagement forums and of what people should/ shouldn't take away from them.

4.7.3 Recovery Plan Action 7.3 *Continue to use hoiho as a focus for conservation advocacy in Otago and Southland.*

Key findings (Action 7.3; Q35):

- Yes, this work is being done but:
 - It is not being guided strategically for the benefit of hoiho.
 - Most advocacy initiatives are not being measured in terms of direct outcomes for hoiho (see 7.1 also).
- There exists a massive and real gap between the public profile of hoiho and the fact that this species is in absolute crisis.
- Conventional conservation messaging might raise awareness of hoiho but social science research tells us it rarely changes behaviour.

Additional comments from Stock-take Team (Action 7.3; Q35)

- Action 7.3 has been partially fulfilled.

4.7.4 Recovery Plan Action 7.4 *The Department of Conservation will authorise suitable people to hold hoiho for treatment of injuries and rehabilitation to the wild.*

Key findings (Action 7.4; Q36):

- The importance and role of rehabilitation within the Hoiho Recovery Programme has shifted since 2000. It is now widely considered a conservation management tool.
- There is more uptake and information sharing around best practice and documentation in the last 3-4 years.
- There is no common view shared by Rūnanga groups about the role of rehabilitation for hoiho. Some are very supportive while others feel the birds should be left alone.
- Rehabilitation does result in population level increases at the local level [29; see also [26]. What is unknown is the extent to which rehabilitated birds contribute to ongoing population growth regionally and whether intensive ongoing rehabilitation alters the genetic health of a population.
- Different practices around the release of rehabilitated birds are a reflection of balancing what is considered best for individual birds versus a local population, as well as social/cultural perspectives and pressures and logistical constraints.
- There are different perspectives between veterinarians and rehabilitation facilities about what should and shouldn't be euthanised – i.e. what birds 'can live with'.
- If DOC had agreed minimum standards around rehabilitation of hoiho this would simplify the permit authorisation process. Currently permits have too much information in them and some of it is not relevant. Also, there is significant scope to improve the structure of permits for rehabilitation (e.g. the standard conditions) compared to promoting best practise. In general the permit process is not considered user-friendly and this is causing frustration for rehabilitation facilities.
- A gap exists around determining best practice (or practices) with regard to the population and for individuals.
- Rehabilitation facilities hold a considerable amount of knowledge and information necessary to fill this gap but lack the resources and support to interrogate the data that already exists. They also lack the programme support required to work cohesively as a strategic group to answer this question as well as other key research questions.
- Monitoring of permit conditions with rehabilitation facilities is fraught because regionally DOC do not have the expertise that is held by the facilities themselves.
- DOC are not being equitable in support of rehabilitation facilities.

- Not having a wildlife hospital in the South Island presents a significant challenge in regard to saving individual birds. Moving birds back and forth to Wildbase (Massey University, Palmerston North) should not become standard practice.
- People in Otago felt that a rehabilitation facility further south would be beneficial. Some people in Southland thought that it was not necessary.

The Stock-Take Team concludes that (Action 7.4; Q36)

- Action 7.4 has been partially fulfilled.
- Rehabilitation of hoiho should not sit within the context of advocacy. It is a conservation management tool.
- Successful rehabilitation requires clarity of objectives. Across the spectrum of the rehabilitation programme there are mixed objectives – even within the conservation management tool context.
- DOC do not own the cost of rehabilitation; they regulate it – these things are not all that well connected.
- There is a lack of clarity around decision making and accountability. People are doing the best that they can in difficult and trying circumstances.
- There are inconsistencies in the way birds enter the system.
- People will struggle to appreciate how valuable good record keeping is if they don't have real-time access to their data in the database.
- There are issues around how best-practice specialist support has been conveyed in the past. This space is apparently very complicated.
- There is not enough feedback of information across the board. Closing the loop with prompt feedback is essential.

4.7.5 Overarching themes from Objective 7

- Objective 7 is too broad, difficult to measure and no longer fit-for-purpose.
- Advocacy initiatives need cover the full geographic range of the species and be more closely aligned with producing tangible outcomes for hoiho.
- A lot of public support exists for hoiho conservation; it is not vested in any one organisation or agency involved with conservation management of hoiho.
- Public investments in hoiho conservation are outstripping those of central government.
- Some smaller organisations struggle because of their size/structure.
- While public investment in hoiho conservation is high, as is public awareness

nationally, the public's understanding of hoiho conservation needs is low.

- g) People working with hoiho believe that the wider public see hoiho as no longer at risk due to the high level of investment in hoiho conservation from private trusts and groups and the high profile of the YEP Trust.
- h) There is a big overlap between hoiho and hectors dolphin that could be the basis for a joint campaign for marine advocacy.
- i) A call for better sharing and dissemination of information and higher standards with regard to the scientific rigour of information. This requirement was not directed toward one particular group but across the entire programme.
- j) Messaging around the role of rehabilitation is complex. It is critical to not lose sight of the wild population.

4.7.6 Additional comments from Stock-take Team on Objective 7

- Two counter views exist about visitors/tourists viewing birds undergoing rehabilitation. It was universally agreed however that birds at a facility for rehabilitation where there is no opportunity to visit a wild population, should not be on display. It is worthwhile noting that this widely held view is counter to the recent wishes of Wellington Zoo that had a hoiho in its care for a brief period of time.

4.7.7 Recommendations from Objective 7 for Stage 2

(Summary of Recommendations 13)

- i) Define what is meant by advocacy in the context of hoiho recovery.
- ii) Ensure advocacy objectives and actions that are likely to produce tangible outcomes for hoiho recovery. Create strategic linkages with other broader advocacy initiatives (e.g. coastal restoration, marine protection).
- iii) Ensure appropriate input for Stage 2 from a social scientist with experience in Community-Based Social Marketing. This recommendation is also relevant in terms of working with the fishing industry.
- iv) Determine the most appropriate community forum/s to maintain/reinstate to deliver a revised advocacy objective. Be clear with participants about the accountability for leadership and purpose of these forums.
- v) Include Ngā Rūnanga perspective that support for hoiho can be whānau-based working alongside DOC as partners and other lead government agencies including Ministry of Primary Industries. With respect to the mahi, extend this concept to key programme partners including the YEP Trust. This model would support the development and/or preservation of mātauranga and the weaving of mātauranga and western-science-based knowledge together.

- vi) Establish a support and coordination network for the rehabilitation community in the development of a cohesive and strategic programme of work for rehabilitation as a conservation management tool for hoiho recovery.
- vii) Work with the rehabilitation community to fill existing research/knowledge gaps and to interrogate the data that already exists.
- viii) Work with the community of rehabilitation experts and providers and veterinary specialists to revise and adopt best practice.
- ix) Review rehabilitation authorities to ensure a focus on the welfare and clinical needs of wild birds.

4.8 Objective 8 *To manage the impacts of tourism by identifying suitable locations for tourist activity to take place.*

4.8.1 Recovery Plan Action 8.1 *To maintain a working relationship with tourist firms and industry representatives through the [Hoiho] Consultative Group and other forums to ensure that impacts on hoiho as a result of tourist operations are minimised and opportunities for co-operation are maximised. The following locations are suitable for development as tourist destinations to observe hoiho:*

- Stony Bay
- Pipikaretu Beach
- Bushy Beach Scenic Reserve
- Sandfly Bay Wildlife Refuge
- Kātiki Point Wildlife Management Reserve
- Nugget Point Reserve
- Kumo Kumo Whero Bay Wildlife Refuge
- Māhaka Point Scenic Reserve

Key findings (Action 8.1; Q37):

- Mixed views were expressed by kaimahi about the ‘success’ of unregulated tourist management at particular sites, in particular Curio, Roaring and Sandfly Bays, and the value, management and ongoing sustainability of the volunteer warden programme with respect to encouraging hoiho populations to thrive.
- Significant concern was expressed by Ngā Rūnanga and many kaimahi in relation to unregulated tourism: an ongoing exponential growth in visitation along the ‘Penguin Highway’, tourist companies that are able to drop large numbers of visitors at sites by bus but have no responsibility for transferring knowledge of appropriate behaviour to

their customers, and technology (smart phones, selfie sticks and potentially drones) that has introduced a range of new behaviours among tourists who lack understanding about what is appropriate behaviour around wildlife.

- It is the (unanimous) view of contributing Ngā Rūnanga that visits to penguin breeding colonies be regulated and appropriate tikanga at these sites observed. Hoiho are a private bird and total support must be given to them at the time of nesting. Ngā Rūnanga emphasised the importance of support for and appropriate training of guides.

The Stock-Take Team concludes that (Action 8.1; Q37):

- Action 8.1 has been partially fulfilled. However, in the case of unregulated tourism, visitor opportunities are often resulting in adverse impacts on local hoiho populations and may be limiting their ability to thrive.
- Actions pertaining to tourism and impacts on hoiho need to be evaluated within the new context of increasing tourism in New Zealand and changes in tourist behaviour.
- Locals use of beaches isn't primarily about penguins.

4.8.2 Recovery Plan Action 8.2 *To advocate that the current practice of viewing hoiho remains the same at the following locations:*

- | | |
|---------------------------------|---------------------------------|
| • Goughs Bay | • Long Point West |
| • Ōkahau Point (Barracouta Bay) | • Penguin Bay |
| • Papanui Beach habitat complex | • Hinahina Cove Scenic Reserve |
| • Ōtapahi | • Pūrākaunui Bay Scenic Reserve |
| • Boulder Beach habitat complex | • Tunnel Rocks Scenic Reserve |
| • Green Island | • Te Rere |
| • Sandy Bay | • Curio Bay |

Key findings (Action 8.2; Q38):

- As above (Recovery Plan Action 8.1)
- Boulder Beach has been closed to visitors through the penguin breeding season since 2006. Some kaimahi expressed a view that this management tool should have been implemented for other sites. One participant strongly disagreed with the closure of this public reserve.

The Stock-Take Team concludes that (Action 8.2; Q38):

- Action 8.2 has been partially fulfilled. However,

- many people noted that they were unclear about what the action actually meant and why these sites are on this specific list, and
- as for 4.8.1, in the case of unregulated tourism, visitor opportunities are often resulting in adverse impacts on local hoiho populations and may be limiting their ability to thrive.
- There is a need for site management objectives which prioritise hoiho management over other land uses on public land.
- The number of complaints about a particular site doesn't equate with 'success'. While the number of complaints at Curio Bay may seem very low, 5-10 complaints annually represents the number of accounts where someone followed through. 5-10 complaints within a season could still result in the complete failure of a breeding colony the size of Curio Bay.

4.8.3 Recovery Plan Action 8.3 *Use of the above lists to guide the issuing of concessions issued by the Department of Conservation in hoiho locations that are part of the public conservation estate.*

Key finding (Action 8.3; Q39):

- High regard exists for current concessionaires running small tourist operations to view hoiho as well as operators running regulated trips on their own land.

The Stock-Take Team concludes that (Action 8.3; Q39):

- Action 8.3 has been partially fulfilled. However the intent of 8.3 is untenable for many situations where large numbers of visitors are being dropped off by buses to visit public reserves. In these situations there is no transfer of best practice as bus companies do not require a concession.

4.8.4 Overarching themes from Objective 8

- a) Objective 8 is not broad enough in terms of the geographic range of hoiho as it only focuses on mainland sites.
- b) Objective 8 is not specific enough for the current day and in the context of changes in tourism and tourist behaviour.
- c) A widely held view that DOC has prioritised unrestricted access and viewing of wildlife over the welfare of an endangered species at a number of sites in particular (but not limited to) Kātiki Point (North Otago) and Enderby Island (Auckland Islands).
- d) The volunteer warden programme has been rolled out with mixed success. There is

confusion about what their role is. Wardens are there to direct and instruct people as to what they can and cannot do; they should not interfere with the work of concessionaries.

- e) Other constraints e.g. increase in numbers of birds; coastal erosion; suitability of site for a structure to be built on - have made the design of viewing areas and access inappropriate in terms of mitigating the potential for visitors to impact on hoiho. Ultimately what is good for the birds has been compromised.
- f) There has been a significant change in the Conservation Management Strategy (CMS) and permissions for access to the Subantarctic Islands. DOC has also dropped the requirement for DOC representation on visits to NZ Subantarctic Islands. CMSs express the policy that visitation will be self-regulating but participants felt strongly that these changes will result in significant negative impacts on hoiho, particularly on Enderby Island.
- g) Freedom camping is an associated issue with unregulated tourism. It involves multiple local government authorities.

4.8.5 Additional comments from Stock-take Team on Objective 8

- The current way that tourism is/isn't managed is not working. It is not sustainable for hoiho. Context is really important. People's views are strongly influenced by their experiences.
- Technology has introduced a whole new range of human behaviours from tourists.
- Nature-based tourism pressures will continue to increase.
- Tourist industry and tourist operators are not the same thing!
- No-one is happy with what is going on at Kātiki point. The viability of hoiho remains threatened by human disturbance at Kātiki Point with no foreseeable resolution.
- There are insufficient linkages with advocacy objective around appropriate messaging, interpretation, and tourism in general.
- There are different perspectives and attitudes between DOC in Otago and Southland.
- There is opportunity for well managed (regulated) tourism activities to benefit hoiho recovery through indirect contribution (conservation advocacy, funding via donations).

4.8.6 Recommendations from Objective 8 for Stage 2

(Summary of Recommendations 14)

- i) Advocate for policy within the relevant Conservation Management Strategies and Conservation Management Plans that supports recovery of the hoiho over and above visitor access to the birds. Account for the full range of tourism activities/tourist behaviours over a range of sites.
- ii) Outline the role and benefits of a range of regulatory tools (e.g. rāhui; changes to land

classification) for hoiho recovery.

- iii) Develop, implement and monitor the success of methods to modify the behaviours of visitors so as to eliminate their impact on the breeding success of hoiho and the future population growth of the species.
- iv) Where it is required measure the impacts of tourism on hoiho directly.

4.9 Objective 9 *To identify and undertake research on hoiho that will assist in achieving the objectives of this plan.*

4.9.1 Recovery Plan Action 9.1. *Evaluate research proposals which involve hoiho to ensure that any adverse effects are minimised.*

Key Findings (Action 9.1; Q41):

- Proposals submitted to DOC are not always assessed by people with appropriate knowledge or awareness of what is best for hoiho (i.e. adequate local knowledge of hoiho populations, management and research activities).
- There were mixed views among participants about how well this action has been implemented. Three specific examples were given where there was significant concern that either adverse effects (on hoiho) were not minimised and/or that there was nothing of conservation value to hoiho to be gained from the activity.

The Stock-Take Team concludes that (Action 9.1; Q41):

- Action 9.1 has been partially fulfilled.

4.9.2 Recovery Plan Action 9.2 *Encourage research that is of direct management need to hoiho.*

Key findings (Action 9.2; Q42):

- Hoiho recovery would benefit immeasurably from having a prioritised and coordinated programme of research.
- There has been too much reliance on the enthusiasm of students rather than working with principle investigators to establish a programme of research and provide continuity and capability, support for funding, and feedback into management practices.

The Stock-Take Team concludes that (Action 9.2; Q42):

- Action 9.2 has been partially fulfilled. The intent of 9.2 has been delivered on however this has frequently not translated into a benefit to hoiho because recommended management actions have not been applied.
- There is a lack of coordinated leadership of research to support hoiho recovery and confusion about the role of DOC in this work.
- People's definitions of research vary and seem to be related to their level of participation - i.e. there is a grey area in between monitoring and research.
- The field monitoring programme for hoiho is subject to external expectations from researchers/research programmes. These expectations are not being managed tightly enough.
- There is a lack of research that influences improved management for the species.

4.9.3 Recovery Plan Action 9.3 *Give priority to writing up existing data before initiating new projects.*

Key findings (Action 9.3; Q43):

- Action 9.3 has been partially fulfilled. As with 9.2 the intent of 9.3 has been delivered on however this has frequently not translated into a benefit to hoiho because recommended management actions have not been implemented.
- Follow-up by DOC on the provision of data and or reports and papers pertaining to hoiho is working but it seems to be very relationship-based rather than a consequence of good [DOC] process or adequate capacity to undertake the work.
- There are significant problems with the existing YEP database (see 5.5 pages 74-75) which are impinging on achieving action 9.3.

The Stock-Take Team concludes that (Action 9.3; Q43):

- Action 9.3 has not been fulfilled. While a considerable amount of research has been completed to a peer-reviewed standard the Hoiho Recovery Programme has been inadequate in driving and supporting this effort as a priority.
- The YEP database is currently not fit-for-purpose to achieve action 9.3. (e.g. some recommendations to management have not been actioned (e.g. resourcing fixing known errors in the database).
- We were provided with examples of research that have increased understanding but this knowledge has not been translated into a new or improved management for the species (e.g. Rakiura Anglem coast study).

4.9.4 Overarching themes from Objective 9

- a) There is insufficient strategic leadership from DOC - the Hoiho Recovery Programme is not asking the right questions and the research initiatives are too reactive. Ngāi Tahu and DOC, in conjunction with the YEP Trust, ought to undertake a leadership role in providing clear direction on the kaupapa for hoiho by prioritising the direction of research.
- b) Peer-reviewed research results are all too often not translated into management decisions and actions.
- c) Ngā Rūnanga commented that research requires additional funding.
- d) Barriers exist to sharing information:
 - resources, including capacity (e.g. to examine data, undertake analysis, write reports and publish the findings);
 - the integrity and structure of the current data base and investment in that database;
 - DOC process [e.g. lack of commitment to enforcing permit conditions follow-up requesting copies of papers and reports).
- e) The DOC permissions process has been cumbersome and lengthy, in part, due to restructuring at DOC and because the process is now managed from Hamilton, sometimes without local input.
- f) A large number of recommendations for future research were received and will be available for Stage 2 of the review.

4.9.5 Additional comments from Stock-take Team on Objective 9

- The need for an adaptive management approach is strongly implied.
- The existence of the YEP database promotes high expectations of detailed science. However, this expectation may not have been its purpose, or, this purpose was not explicitly communicated to or understood by the ‘owners’ of the YEP database.
- There has been insufficient leadership from DOC with a culture of gathering monitoring data without enquiry, interrogation and analysis. .
- DOC has a confused relationship with research - as an organisation it expects answers but is not prepared to make the investment over 5-10 years.
- As a species that inhabits both terrestrial and marine environments the context within which research for this species sits is less popular within DOC than other threatened birds (e.g. mohua and forest bird conservation).
- It is the Stock-take Team’s preliminary assessment that research priorities for hoiho recovery are in the marine space; research needs to be more about the drivers and ecological process of the system, rather than the biology of hoiho as a top predator.

4.9.6 Recommendations from Objective 9 for Stage 2

(Summary of Recommendations 15)

- i) Confirm the importance and priority of progressing research about marine pressures and management approaches for hoiho recovery.
- ii) Include a specific research/knowledge strategy for hoiho encompassing:
 - a. a clearly defined purpose;
 - b. western science and mātauranga; and that
 - c. priority is given to understanding the marine ecology of hoiho and agents of decline within the marine system.
- iii) Support research that clearly demonstrates conservation management benefits to hoiho. Researchers must be able to clearly convey why the research needs to be on hoiho specifically.
- iv) Establish and maintain an adaptive management framework for the hoiho conservation programme through ensuring that management outcomes are monitored, assessed and used to inform adjustments to future management.

Part 5 General Questions - Ngā pātai

5.1 Question 45

Do you think the Recovery Plan provides sufficient and clear enough objectives to achieve long-term recovery for hoiho within the stated timeframe (2000-2025)?

5.1.1 Key themes from Q45

No it does not. In addition to the preceding comments made on specific objectives:

- a) The Hoiho Recovery Plan is no longer fit-for-purpose although many of the objectives and actions are still relevant.
- b) The Hoiho Recovery Plan does not adequately address all current risks to the populations across the full geographic range of the species. In general a recovery plan should be treated as a 'living' document and should be reviewed at a minimum of 5 years or as often as required to reflect improved knowledge, changing pressures and priorities and emerging issues.
- c) There is inconsistency between the NZ threat classification and the IUCN classification.
- d) Gaps with the existing plan include: the formal application of Mātauranga Ngāi Tahu within the programme to broaden and advance knowledge of hoiho and support kaitiakitanga and management into the future; identifying percentages for other types of mortality (in addition to fisheries by-catch) and prioritisation of mitigation accordingly; establishing a framework for the use of rehabilitation as a conservation management tool; SMART objectives to advance an understanding of what is happening for hoiho at sea; sufficient scope and SMART objectives to influence tourism impacts on hoiho (positive and negative); for a strategic programme of inquiry and research across the whole programme.
- e) There is a need to expand on what is working well immediately in order to assist hoiho now.

5.1.2 Additional comment from Stock-take Team on Q45

- The plan is very focused on Otago and Southland; it is not broad enough in terms of taking in the full geographic range of the species. Greater understanding exists now as to the genetic structuring and distinctiveness of the mainland/Rakiura and Subantarctic populations.

5.1.3 Recommendation from Q45 for Stage 2

(Summary of Recommendations 1)

- i) Implement Stage 2 of the Hoiho Recovery Programme review; hoiho recovery in 2016 and beyond needs to be guided by a new strategy. The current Plan is no longer fit-for-purpose for the future, although many of the objectives and actions are still relevant.

5.2 Question 46

What is the greatest single weakness within the Hoiho/Yellow-eyed Penguin Recovery Programme that is currently hindering the achievement of agreed goals?

5.2.1 Key themes from Q46

- a) Lack of an evidence-based adaptive management approach.
- b) Poor understanding of how to manage a marine bird – a threatened species in the marine environment.
- c) Lack of actions around direct and indirect fisheries impacts.
- d) Criticism of DOC's inability to harness and direct all of the willingness to do the work.
- e) Complex leadership roles exist within the wider hoiho recovery programme.
- f) Prior to 2000 hoiho were perceived as an 'Otago' species and therefore an Otago problem. There needs to be a whole-of-species approach.
- g) The current recovery strategy for hoiho is out of date.
- h) The assertion that: *'Conservationists are too preservationist – they are not hearing what we have to say.'* Cultural harvest is about sustainable management. Marine management tools are there for protection and sustainability that is what we are all about. To clothe, house, and feed the whānau and our manuhiri equals huge mana. Ngāi Tahu mahinga kai principles and values are not reflected in the plan perspective is not reflected in the plan.
- i) A sense of urgency is required. Everyone recognises that the species [hoiho] is in trouble.
- j) The level of resourcing and leadership and technical support required by DOC does not match the needs of the species.
- k) Hoiho does not fit the recovery model for terrestrial species recovery – occupies marine and terrestrial space.

5.2.2 Additional comment from Stock-take Team on Q46

- The Hoiho Recovery Programme needs to include all agencies that have a duty of care and/or/legislative responsibility for security and recovery of the species.

5.2.3 Recommendations from Q46 for Stage 2

- See Part 4.0 (i, ii) (page 30) in regard to including the perspectives of Te Rūnanga o Ngāi Tahu (Summary of Recommendations 2(i, ii)).
- See Part 4.0 (iii) (page 30) in regard to including an inter-agency approach for addressing relevant issues in marine and terrestrial ecosystems with clearly identified accountabilities for the associated management actions (Summary of Recommendations 2(ii)).
- DOC to invest in hoiho recovery at the appropriate level: governance, leadership and technical support. On the ground give appropriate support to the community groups to do the mahi/work. (Summary of Recommendations 16)
- Enable Yellow-eyed Penguin Trust to invest in hoiho recovery at the appropriate level: leadership and technical support as well as on-the-ground management to support kaimahi/penguin community groups (Summary of Recommendations 19).
- Structure the new strategy for hoiho around biologically meaningful populations of the species rather than taking a human-centric approach (i.e. Department of Conservation district boundaries; Summary of Recommendations 3).

5.3 Question 47

The current long term goal for the Hoiho Recovery Plan is: Hoiho populations have increased and the community is actively involved in their conservation. In your opinion is this goal still relevant?

5.3.1 Key themes from Q47

- Yes. The essence of this goal remains relevant – it has not been achieved.
- However, the long-term goal for the recovery of hoiho also needs to relate to:
 - our understanding of a thriving healthy population; and
 - attaining a non-threatened status.
- Effort needs to be prioritised and more targeted.
- Rūnanga agree that the goal is relevant, however, it is not yet achieved.

5.3.2 Recommendation from Q46 for Stage 2

- i) While the current goal of the Hoiho Recovery Plan remains relevant, the future strategy should include (see Summary of Recommendations 4):
- a. a collective understanding from Te Rūnanga o Ngāi Tahu, papatipu rūnanga and kaimahi of what constitutes a thriving healthy population of hoiho; and
 - b. a recovery goal of attaining a non-threatened status.

5.4 Question 48

List key components not in the current recovery programme that you feel are essential for achieving long-term recovery of hoiho/yellow-eyed penguin in the future (within the next 10 years).

5.4.1 Key themes from Q48

- a) Focus research and management on large (i.e. strategically important for the species) conservation problems that can be solved in the short term.
- b) Aligning the New Zealand threat classification system ranking for YEP (currently nationally vulnerable) with the International Union for Conservation of Nature list (Endangered). The difference in threat classification for hoiho was seen as pertinent because the IUCN 2012 assessment for hoiho was considered inadequate.
- c) A Mass Mortality SOP (Standard Operating Procedure) and strategic framework for rehabilitation of hoiho as a conservation management tool.
- d) A reliable, accessible and fit-for purpose database and a means to retrieve and interact with the data more easily.
- e) Sufficient resourcing to do the work that is required to an acceptable standard.
- f) Application of new technology at the appropriate time and in the appropriate way.

5.4.2 Additional comments from Stock-take Team on Q48

- Should the YEP database be included as an action or objective? There is a need to be more specific about data requirements and the management thereof.

- Some marine experts made the point very strongly that objectives/actions relating to disease and marine issues could become significant and costly distractions for the programme. Their recommendations have come with some very clear caveats in regard to where the focus for hoiho should be.
- Government prioritisation of resourcing for threatened species in New Zealand is based on the NZ Threat Classification System and other prioritisation tools used within DOC¹³. IUCN criteria are based on different drivers and are not especially helpful in the New Zealand context. The current Hoiho Recovery Plan states that plan that “*The [recovery] goal will be achieved when the IUCN threat status and the Department of Conservation’s priority status of hoiho has been improved by at least one category.*” Inclusion of the IUCN threat status as a measure of attaining the objective is confusing.
- The IUCN threat status is relevant to some NGOs who seek funding internationally.

5.4.3 Recommendation from Q48 for Stage 2

(Summary of Recommendations 20)

Critically evaluate all of the key components listed in 5.4.1 for achieving long-term recovery of hoiho

(5.4.1 (i)). Give priority to:

- i) research and management that is likely to provide significant recovery outcomes and that can be solved in the short term;
- ii) a ‘mass mortality’ operational plan and strategic framework for rehabilitation of hoiho as a conservation management tool;
- iii) developing a clear understanding of the long-term data needs and the development of a reliable, accessible and fit-for purpose database to deliver this (refer to Part 5.5.3 (i, ii, iii));
- iv) advocating for sufficient resourcing to do the work that is required to an acceptable standard.

¹³ <http://www.doc.govt.nz/about-us/our-role/managing-conservation/natural-heritage-management/identifying-conservation-priorities/>

5.5 Question 49

How useful are current data management systems for hoiho/yellow-eyed penguin recovery in terms of your work?

5.5.1 Key themes from Q49

- a) DOC has managed the YEP database since 1996. There has been an under-investment in this task. The work has been resourced through an assortment of funds rather than as core business.
- b) Feedback was received at many levels about problems with the database, data curation and capacity to do the required work with data and the database. There is a lack of confidence in quality of data; a significant body of work identifying errors with the database has not lead to any action in correcting these mistakes.
- c) The Hoiho Recovery Plan and Recovery Programme provide no clear statement about what the purpose of the database is and what it needs to achieve.
- d) There is an expectation that the database will continue to exist and that it will be managed by DOC as lead-authority. People view the database (and management of data) as an extension of authorising activities under the Wildlife Act [30].
- e) Different practitioners have different expectations of the data that will be contained within the YEP database and how it will be managed.
- f) What is required is far beyond the current resourcing of the programme.
- g) While significant problems exist with the YEP database, there also needs to be a stronger commitment to collecting appropriate data and making it available.
- h) Most people willingly contributed to the database. However the main tool used by the community to do this is an Excel data sheet and Word nest record sheets. People are constantly doing ‘work-arounds’ to share information because of access issues and the skill required to use Access.
- i) The use of multiple data entry points (field note books into Word into Excel into the database) results in a high risk of errors. This situation is made worse by the manual use of transponders.
- j) The data contained within the database is of immense value to academics and managers and every effort must be made to improve this situation – urgently. There are some excellent models to draw solutions from.

5.5.2 Additional comments from Stock-take Team on Q48

- Identifying the purpose and needs of data management for the new hoiho recovery strategy is critical. The best platform and structure for curating and inputting data can then be determined. One outcome may be that the existing data-set is curated (so it is error-free) and archived for easy retrieval and analysis and that a new purpose-built system is created.

5.5.3 Recommendations from Q47 for Stage 2

- i) DOC to curate the existing YEP database so that is error-free. The information required to do this work is available. This work should be done immediately so that the available data can be used to inform Stage 2 (Summary of Recommendations 21).
- ii) Define the purpose and needs of data management to support the new hoiho strategy (Summary of Recommendations 22).
- iii) Investigate alternative database software options to align with the new Hoiho Recovery Strategy and address issue of data accessibility, data entry and maintenance.

5.6 Question 50

What do you consider as the most pertinent information to be reported on annually for hoiho/yellow-eyed penguin?

5.6.1 Key themes from Q50

- a) Within the programme there has been a shift away from capturing survival data. Adult survival data is a critical population parameter for long-lived species. It requires a permanent marking tool that can be used to detect birds. For some hoiho populations, quality data for adult survival could be obtained but it would not be appropriate for widespread use.
- b) Nest monitoring provides more immediacy of information such as in regard to predation, starvation or disease events.
- c) Permanent marking of birds is not an objective in itself but is critical to the programme outcome. It has not had the focus required to progress key issues including: the quality of banding, transponders being used manually as opposed to part of an automated system for which they were designed and therefore errors associated with transcribing transponder numbers.
- d) A view that more work should be done on this for the benefit of the wider programme.

5.6.2 Recommendations from Q50 for Stage 2

- i) See Part 4.1.9 (i) which states: Establish an adaptive management framework for the Hoiho Recovery Programme. This approach will require a strategy that supports (b) Identification of key baseline monitoring data required to address key questions and hypotheses in order to inform ongoing hoiho management, including the management actions, frequency and intensity necessary (Summary of Recommendations 7(i)).
- ii) Resolve critical issues around the permanent marking of birds including:
 - a. further development of standards and best practice; and
 - b. the removal of barriers to meeting best practice.

(Summary of Recommendations 21).

5.7 Question 51

How do you access information about hoiho conservation?

5.7.1 Key themes from Q51

- a) In addition to comments made under the objectives it is noteworthy that the transfer of information appears to be more-relationship based than a consequence of DOC process. Exceptions include the YEP Annual Symposium (a joint initiative with the YEP Trust), pre-season updates (Otago) and communication via the Otago-based DOC Biodiversity ranger role.
- b) Outside of DOC-led initiatives participants referred to the YEP Trust Newsletter, website and publications; the current recovery plan, scientific publications.

5.7.2 Recommendations from Q51 for Stage 2

- i) Provide access to expertise for technical and strategic advice via a hoiho or penguin species specialist group (Summary of Recommendations 25).
- ii) Provide greater clarity around DOC leadership and management roles pertaining to hoiho and responsibilities for operational/delivery work on hoiho (Summary of Recommendations 17).
- iii) See Part 4.5.6 (iii) which states: Require and support the application by kaimahi of current best practice for predator control, maintaining efficacy and the use of ‘new tools’ where appropriate (Summary of Recommendations 11(iv)).
- iv) See Part 4.7.7 (iv) which states: Based on the revised advocacy objectives determine

the most appropriate forum/s to maintain/reinstate. Be clear with participants about the accountability for leadership and purpose of these forums (Summary of Recommendations 13(iv)).

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Appendix 1 Te āpitihanga tuatahi

List of participants - He rārangi ingoa

Ngā Rūnanga			
Geographical Area	Rūnanga		Interview type
Murihiku	Awarua Rūnanga	Gail Thompson	Murihiku kanohi ki te kanohi and written
	Ōraka Aparima Rūnaka	Stewart Bull	Murihiku kanohi ki te kanohi
		Sandra Cook	Murihiku kanohi ki te kanohi
	Ann Wakefield	Murihiku kanohi ki te kanohi	
Hokonui Rūnanga	Rewi Anglem	Murihiku kanohi ki te kanohi	
Murihiku papatipu rūnaka and Te Ao Mārama	Michael Skerrett	Written	
Ōtākou	Te Rūnanga o Ōtākou	Natalie Karaitiana	Ōtākou kanohi ki te kanohi
		Hoani Langsbury	Ōtākou kanohi ki te kanohi
	Kāti Huirapa Rūnaka ki Puketeraki	Brendan Flack	Ōtākou kanohi ki te kanohi
	Patrick Tipa	Did not attend hui	
Te Rūnanga o Moeraki	David Higgins	Did not participate	
North Ōtākou	Te Rūnanga o Waihao	Suzanne Eddington	Waihao kanohi ki te kanohi
		Sara Eddington	Waihao kanohi ki te kanohi
	Dardanelle Mclean	Did not attend	
	Te Rūnanga o Arowhenua	Teoti Jardine	Arowhenua Kanohi ki te kanohi
	Mandy Home	Unable to participate	

Te Pātaka o Rākaihautū (Horomaka)	Te Taumutu Rūnanga Wairewa Rūnanga Ōnuku Rūnanga Te Rūnanga o Koukourārata Te Hapū o Ngāi Wheke (Rāpaki)	Terrianna Smith Iaeen Cranwell Debbie Tikao Pere Tainui Peter Ransden Yvette Couch-Lewis	Kōrero waea Did not respond Kōrero waea Combined with Rāpaki Kōrero waea Knowledge based on white-flipped Kōrero waea with Kerri-Anne Edge Hill
Ōtautahi	Te Ngāi Tūāhuriri Rūnanga	Joseph Hullen	Kōrero ā-pepa
Catlins	Waitaha	Maureen Wylie	Kōrero waea
Whenua Hou	Whenua Hou Management Group	Tane Davis	Kōrero ā-pepa
Name	Affiliation	Role at the time of the interview	Interview type
Affleck, Stu	Long Point, Catlins	Landowner, Long Point / Irahuka Advisory Group	Face-to-face interview
Agnew, David	Department of Conservation - Dunedin	Conservation Services Manager	Face-to-face interview
Argilla, Lisa	Wellington Zoo	Veterinary Scientist	Phone interview
Bardsley, Emma	Department of Conservation - Owaka	Ranger	Face-to-face interview
Beggs, Wayne	Department of Conservation – Christchurch	Ranger	Face-to-face interview with Bruce McKinlay
Brass, Murray	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Burgess, Elaine	Penguin Rescue, Kātiki Point	Volunteer	Face-to-face interview
Chilvers, Louise	Massey University, Wildbase	Senior Research Officer, Oiled Wildlife Response	Skype interview
Cole, Ros	Department of Conservation - Invercargill	Conservation Services Manager	Phone interview
Crawford, Andrea	Department of Conservation - Dunedin	Communications Advisor	Face-to-face interview
Darby, John	Wanaka, formerly Otago Museum and University of Otago	Scientist	Written submission
Debski, Igor	Department of Conservation - Wellington	Science Advisor – Marine Threats	Phone interview
Dobbins, Phred	Department of Conservation - Rakiura	Ranger	Phone interview
Ellenberg, Ursula	Eudypes Consulting & former post-graduate student at University of Otago	Researcher	Skype interview
Frazer, Lala	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview; written submission

Fyfe, Jim	Department of Conservation - Dunedin	Ranger	Face-to-face interview
Gardener, Luke	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Gartrell, Brett	Massey University, Wildbase	Associate Professor & Director	Phone interview
Geytenbeek, Mark	Ministry for Primary Industry	Scientist	Phone interview
Goldsworthy, Rosalie	Penguin Rescue, Kātiki Point	Manager	Face-to-face interview and site visit to Kātiki Point; written submission
Haley, Marie	Banks Peninsula Conservation Trust	Wildside Coordinator	Face-to-face Interview
Heezik, Yolanda	University of Otago	Associate Professor; Department of Zoology	Face-to-face interview
Hiscock, Jo	Department of Conservation – Murihiku and Southern Islands District	Acting Conservation Services Manager	Face-to-face interview
Houston, Dave	Department of Conservation - Species & Ecosystems	Technical Advisor	Phone interview
Johnstone, Roy	South Otago Forest & Bird	Chair of Branch, volunteer trapper	Face-to-face interview
Kennedy, Euan	Yellow-eyed Penguin Trust - Board	Trustee	Joined YEP Trust Board meeting via conference call; written submission
King, Lisa	Penguin Place, Otago Peninsula	Manager	Face-to-face interview and site visit to Penguin Place
King, Sandy	Paws 4 Conservation; Contractor to YEPTTrust and DOC	Conservation Practitioner	Phone Interview
Lalas, Chris	Penguin Rescue, Kātiki Point	Scientist	Face-to-face interview and site visit to Kātiki Point; written submission
Langsbury, Hoani	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Malthus, Tony	St Kilda Veterinary Clinic	Veterinary services	Face-to-face interview
Mark, Pat	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Mattern, Thomas	Eudypes Consulting & former post-graduate student at University of Otago	Scientist	Phone interview
McClelland, Pete	Formerly DOC; currently independent contractor	DOC - Programme Manager Southern Islands (Offshore Islands)	Face-to-face interview
McFarlane, David	Yellow-eyed Penguin Trust	Field Manager	Face-to-face interview
McInnes, Kate	Department of Conservation Science and Policy	Wildlife Veterinarian	Phone interview
Melgren, Phil	Department of Conservation Murihiku District	Conservation Partnerships Manager	Face-to-face interview
Molloy, Janice	Southern Seabirds Solution Trust	Convenor	Phone interview
Murrell, Margaret	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Nathan, Walker	Ministry for Primary Industry	Principal Scientist	Phone interview
Nelson, Dean	Department of Conservation	Conservation	Phone interview

	Twizel District	Services Manager	
O'Callaghan, Brian	Kaka Point	Trapping at Nugget Pt - volunteer	Face-to-face interview
O'Callaghan, Jan	Kaka Point	Trapping at Nugget Pt - volunteer	Face-to-face interview
Pillai, Anita	Yellow-eyed Penguin Trust - Staff	Nursery Manager	Face-to-face interview
Pullar, Cheryl	Department of Conservation Catlins	Ranger	Face-to-face interview
Ramm, Kris	Department of Conservation Science and Policy	Science Advisor	Phone interview
Rance, Brian	Department of Conservation - Species & Ecosystems Southland Forest & Bird	Technical Advisor & Management of Te Rere Penguin Reserve	Phone interview
Ratz, Hiltrun	Penguin Rescue, Kātiki Point	Scientist	Face-to-face interview and site visit to Kātiki Point
Reid, Julia	Penguin Place, Otago Peninsula	Staff	Face-to-face interview and site visit to Penguin Place
Reynolds, Linda	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Rufaut, Cathy	Otago Peninsula Biodiversity Group	Project Manager	Face-to-face interview
Salt, Amanda	Department of Conservation Coastal Otago District	Ranger	Face-to-face interview
Schutt, Kristina	Christchurch	Penguin rehabilitation centre	Face-to-face interview
Seddon, Phil	University of Otago	Professor; Director of Wildlife Management Programme	Face-to-face interview
Shanks, Ray	Department of Conservation Catlins	Ranger	Face-to-face interview
Shannon, Susan	Christchurch	Veterinary services	Written submission
Shelton, Eric	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Simkins, Peter	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Simons, Marcus	Department of Conservation – Coastal Otago District	Senior Ranger	Face-to-face interview
Slooten, Liz	University of Otago	Professor, Department of Zoology	Phone interview
Smith, David	Yellow-eyed Penguin Trust - Board	Trustee	Face-to-face interview
Stracke, Thomas	Christchurch	Penguin rehabilitation centre	Face-to-face interview
Sutherland, Fergus	Southland Forest & Bird	Caretaker for Te Rere Penguin Reserve	Face-to-face interview
Taylor, Graeme	Department of Conservation Science and Policy	Science Advisor	Phone interview
Thomson, Leith	Yellow-eyed Penguin Trust - Staff	Senior Ranger	Face-to-face interview
Thornton, Juanita	Venture Southland	Community Development Planner	Face-to-face interview
Watts, Jim	Department of Conservation Coastal Otago District	Ranger	Face-to-face interview

White, Bridey	Massey University, Wildbase	Veterinary Nurse	Skype interview
Wilson, Craig	Department of Conservation Coastal Otago District	Ranger	Face-to-face interview
Wing, Lucy	University of Otago, Department of Marine Sciences	Scientist	Written Submission
Young, Mel	Department of Conservation - Coastal Otago District	Ranger	Phone interview
Young, Jim	South Otago Forest & Bird	Catlins trapping - volunteer	Face-to-face interview

Appendix 2 Te āpitihianga tuarua

He kōrero mō te Hoiho

A think-piece on the Hoiho/Yellow-eyed Penguin

Megadyptes antipodes

This paper may be cited as: Davis, K. 2015. *He kōrero mō te Hoiho - A think-piece on the Hoiho/Yellow-eyed Penguin Megadyptes antipodes*. Unpublished report, Christchurch, N.Z.

Hoiho/Yellow-eyed Penguin (*Megadyptes antipodes*) is a large penguin, endemic to Aotearoa/New Zealand, and is the sole extant member of its genus. It is the focus of a large tourist industry in Otago (Scofield & Stephenson 2014). It is a taonga species listed on the Ngāi Tahu Claim Settlement Act.

Hoiho/Yellow-eyed Penguin (*Megadyptes antipodes*) breeds only on Motu Ihupuku/Campbell Island, Motu Maha/Auckland Island, Rakiura/Stewart Island, Whenua Hou/Codfish Island and in lesser population concentrations along the Southland and Otago coasts, with a few pairs on Te Pātaka o Rākohū/Banks Peninsula. Vagrants occur in Taranaki, East Cape, Tini Heke/The Snares and Rēkohū/Chatham Islands (Scofield & Stephenson 2014).

Mātauranga Māori

An Ōtākou kaumātua considered that Hoiho is thought to be a shortening of the word Hoihoi, which can be interpreted as 'deafening' or 'noisy'. There is a small chance it could be an onomatopoeic description of the species' call (Scofield & Stephenson 2014).

An informant of Beattie (1949) noted observing multiple species of penguin, including Hoiho, in his journeys around the seaside fiords of Fiordland.

A consideration of the Ethno-history and breeding biology relating to the traditional harvesting of penguin eggs, by Ngāi Tahu tūpuna, can be found in Fyfe & Davis (2015). These occurrences, particularly in Murihiku, are likely to have included Hoiho during the main incubation season from September to October (1-2 eggs over 39-51days).

Whakapapa

Kahukura was the atua that facilitated the populating of Te Waka o Aoraki with birds and other creatures. The 'War of the birds' tradition, recorded by 19th century ethnologists and reiterated in Riley (2001) was the event that determined which species would reside near the oceans, up rivers and lakes and in the forests. Thus, during this event, the placing of penguins in marine environments could be conceptualised as being a result of the conflict.

Hurumanu, a child of Rangi and Papa, is thought to be the progenitor of seabirds (other than; gulls, terns, albatrosses, tītī, shags, ducks, dabchicks, bitterns - who are the progeny of Punga, a child of the winter-maiden and the sun), and therefore penguins (Riley 2006).

Mahinga kai

Aside from the fore-mentioned bird-egg harvesting for mahinga kai, the archaeological record contains multiple sites that have evidence of Hoiho (and/or the *Megadyptes waitaha* variant*) adults taken for kai (a sample of these can be seen in Table. 1).

Recommendation

With this information in mind, it is recommended that Ngāi Tahu should seek to be involved in the management of this species, as with other Taonga species, in the hope that in the future, a self-sustaining population of this species maintains its ecological niche in balance with other species and maybe sustainably utilised for mahinga kai by Ngāi Tahu.

*Recent ancient DNA research has found that Hoiho may be a recent arrival from the sub-Antarctic Islands that replaced the habitat of the 'Waitaha Penguin' *Megadyptes waitaha*, an extinct relative (Boessenkool *et al.* 2009).

References

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- Fyfe, R.; Davis, K. 2015. Harvesting of ngā hua manu (bird eggs) in Te Waipounamu (South Island), New Zealand. *Records of the Canterbury Museum*, vol. 29, pp. 35-46.
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- Riley, M. 2006. *Manu Maori*, Viking Sevensseas NZ Ltd., Paraparaumu, New Zealand.
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Appendix 3 Te āpitihanga tuatoru

Student Research projects 2000-2016 -

Ngā kaupapa rangahau a ngā tauira

2000-2016

2004. Yellow-eyed Penguins (*Megadyptes Antipodes*) and Snares Penguins (*Eudyptes robustus*): a thesis submitted for the degree of Doctor of Philosophy at the University of Otago, Dunedin. **Melanie Massaro.**

2004. Life-history consequences of sociality in the yellow-eyed penguin (*Megadyptes antipodes*) in relation to social facilitation, vocal recognition and fidelity towards mates and nest sites: a thesis submitted for the degree of Doctor of Philosophy at the University of Otago, Dunedin. **Alvin Setiawan.**

2007. Diet of yellow-eyed penguins on Stewart and Codfish Islands: Is diet responsible for poor yellow-eyed penguin chick survival on Stewart Island? A thesis submitted for the degree of Master of Science at the University of Otago, Dunedin. **Tiff Browne.**

2007. The spatial ecology of yellow-eyed penguin nest site selection at breeding areas with different habitat types on the South Island of New Zealand: a thesis submitted for the degree of Master of Science at the University of Otago, Dunedin. **Ryan D. Clark.**

2007. Epidemiology of avian malaria in yellow-eyed penguins (*Megadyptes antipodes*). A thesis submitted for the degree Master of Science at the University of Otago, Dunedin. **Hugh Sturrock.**

2008. An investigation of Leucocytozoon in the endangered yellow-eyed penguin (*Megadyptes antipodes*). A thesis submitted for the degree Master of Science at the University of Otago, Dunedin. **Andrew Hill.**

2009. Assessing the impact of human disturbance on penguins: a thesis submitted for the degree of Doctor of Philosophy at the University of Otago, Dunedin. **Ursula Ellenberg.**

2009. Spatial and temporal genetic structuring in yellow-eyed penguins: a thesis submitted for the degree of Doctor of Philosophy at the University of Otago, Dunedin. **Sanne Boessenkool.**

2009. Beach behaviour of yellow-eyed penguins on Enderby Island, Auckland Island Group, New Zealand. Wildlife Management Report no. 225, University of Otago, Dunedin. **Melanie Young.**

2010. Sandfly Bay revisited: A report on visitor attitudes, awareness, and activities at the Sandfly Bay Wildlife Refuge, Otago Peninsula. Wildlife Management Report no. 237, University of Otago, Dunedin. **Aviva Stein, K. Beer, and P. J. Seddon.**

2012. Lifetime reproductive success in yellow-eyed penguins: Influence of life-history parameters and investigator disturbance. A thesis submitted for the degree Master of Science at the University of Otago, Dunedin, New Zealand. **Aviva Stein.**

2013. Determining the drivers of yellow-eyed penguin/hoiho (*Megadyptes antipodes*) productivity. A thesis submitted for the degree of Master of Science in Wildlife Management at the University of Otago, Dunedin, New Zealand. **Melanie Young.**

2014. Are transponders a reliable primary mark for yellow-eyed penguins? Morgan Whitney.

2003. Assessing the impact of unregulated nature-based tourism in coastal Otago: Pilot study to quantify visitor numbers, attitudes and activities at the Sandfly Bay Wildlife Refuge, Otago Peninsula. Wildlife Management Report University of Otago, Dunedin. Seddon, P.; Smith, A.; **Dunlop, Erin;** Mathieu, R.

2015. Impacts of Stomach Flushing on Breeding Success and Adult Resighting in Yellow-eyed Penguins (*Megadyptes antipodes*). A thesis submitted for the degree of Master of Science in Wildlife Management at the University of Otago, Dunedin, New Zealand. **Ben Goldsworthy.**

2015. An investigation of the causes of mortality in yellow-eyed penguins (*Megadyptes antipodes*) across their range with specific emphasis on the role played by Leucocytozoon. Unpublished MVSc thesis. Massey University, Palmerston North, New Zealand. **Lisa S. Argilla.**

Submitted 2016. Indicators and Influences of Reproductive Success in Yellow-eyed Penguins. A thesis submitted for the degree of Master of Science in Wildlife Management at the University of Otago, Dunedin, New Zealand. **Rohan Menzies.**

Ends
