50 YEARS WITH IMPACT
Journal of Applied Ecology
1913 2013 British Ecological Society CELEBRATING 100 YEARS

Journal of Applied Ecology 2013 doi: 10.1111/1365-2664.12062

PRACTITIONER'S PERSPECTIVE

New Zealand Species Recovery Groups and their role in evidence-based conservation

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Key-words: evidence-based conservation, hihi, New Zealand, research impact, species recovery groups, species recovery plans, stitchbird

New Zealand recovery groups

New Zealand (NZ) is recognized globally as an important biodiversity hotspot. The Government is committed to protecting the nation's unique flora and fauna via its Department of Conservation (DOC). An important component of threatened species management has been the creation of species recovery groups and associated recovery plans. Recovery plans aim to summarize the current state of knowledge for a given species and identify a range of short- and long-term management goals which the group works towards. Recovery groups are made up of species experts and are charged with providing advice on the management and recovery of the species.

Membership of recovery groups normally includes scientists. In the past, professional scientists in recovery groups were from within DOC, but there is now a growing representation of scientists from academia in some groups (Table 1). In effect, this makes the recovery groups an ideal conduit for evidence-based conservation, although their role as such has never been evaluated, nor was it their original purpose. We know that evidence-based conservation is important (Sutherland *et al.* 2004), but it requires both scientists willing to work on relevant applied questions and managers to work with these scientists to identify relevant questions and to ensure appropriate implementation of research findings.

However, DOC employees have recently expressed mixed views on the success of managing threatened species using recovery groups and recovery plans (Seabrook-Davison, Ji & Brunton 2010). In part, this may be because the role of the recovery group has never been well defined. There are a range of limitations using the current recovery group approach to threatened species management in NZ. These are likely to be common issues globally. First, only a small number of recognized threatened species actually have a dedicated recovery group and plan (for example, recovery plans cover 27 bird taxa and there are only 12 active recovery groups, whereas 170 taxa are considered threatened or at risk, Miskelly *et al.* 2008). Further, funding for implementing these plans is currently dependent on priorities of individual DOC administrative regions and is not directed by recovery groups whose primary role is advisory. Funding tends to be limited and directed at the highest priority actions of DOC administrative regions, and so implementation of plans nationally can be piecemeal.

A recent evaluation of opinions of DOC staff revealed that many were frustrated by a lack of coordinated effort (nationally) for threatened species management, even with a recovery group in place, and hence had a mixed view on the utility of recovery groups (Seabrook-Davison, Ji & Brunton 2010). This is of concern because recovery groups should be improving species conservation status and act as powerful tools for evidence-based conservation. A breakdown in the utility of recovery groups, as perceived by DOC staff, may reflect the current decreasing capacity and resources in DOC combined with a failure to increase the contribution from other sectors (science and community). For example, current bird recovery groups are largely small, with an overwhelming membership from DOC (40–82% proportional makeup of groups; Table 1). Few bird recovery groups include a reasonable number of academic researchers (Table 1).

Department of Conservation has recognized its decreasing capacity (related to funding cuts) and is implementing three major changes in its approach to conservation. The first is to combine species-focused recovery groups into broader associations of ecosystem groups or multispecies groups (yet to be defined). The idea is to spread resources further, be more efficient, and to provide a national overview across all threatened and at risk taxa. The second is to use optimization tools (Joseph *et al.* 2008) to allocate conservation work among species at a national level. Third is the encouragement of greater community

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Table 1. Membership of active bird species recovery groups in New Zealand as in October 2012. Membership is divided into those employed by DOC, community group representatives, Iwi representatives (indigenous people) and academic researchers. To emphasize the dominance of DOC employees on these groups, we have also provided their proportional representation in brackets. We provide both the scientific and most widely used common name for each species (where both Maori and European common names are readily used, we provide both)

Bird Species	DOC	Community	Iwi	Research	Total
Apteryx sp. (5 species group), Kiwi	4 (40%)	4	2	0	10
Megadyptes antipodes, Hoiho (Yellow-eyed Penguin)	5 (56%)	1	1	2	9
Hymenolaimus malacorhynchos, Whio (Blue Duck)	6 (55%)	2	1	2	11
Anas chlorotis, Pateke (Brown Teal)	4 (57%)	3	0	0	7
Gallirallus australis, Weka	9 (82%)	2	0	0	11
Porphyrio hochstetteri, Takahe	9 (69%)	1	1	2	13
Himantopus novaezelandiae, Kaki (Black Stilt)	5 (63%	1	1	1	8
Thinornis novaeseelandiae, Shore Plover	8 (80%)	1	0	1	10
Strigops habroptilus, Kakapo	5 (50%)	0	1	4	10
Cyanoramphus malherbi, Kakariki Karaka, (Orange-fronted Parakeet)	13 (77%)	1	1	2	17
***Notiomystis cincta*, Hihi (Stitchbird)**	**8 (29%)**	**9**	**0**	**11**	**28**
Callaeas cinerea, Kokako	9 (55%)	2	0	2	13

The hihi recovery group is highlighted in bold.

involvement in conservation. There is now a rapid growth in community conservation groups managing their own restoration projects or actively running projects on public conservation land. Ideally, these three components will overlap, leading to greater conservation gain. Exactly how DOC will facilitate the integration of these three major changes to threatened species management is unclear. Understanding what works well from current recovery group strategies therefore remains important.

One ramification of decreasing capacity within DOC is that the organization's science and technical capacity is becoming limited, and there is a much greater reliance on outsourcing specialist needs to academic institutions or scientist volunteers. This raises an issue of quality assurance. In the past, DOC science advisers could be held accountable for the advice they provided, and their performance could be managed. This is not necessarily the case where DOC staff or community groups seek advice from external sources. One perceived benefit of recovery groups is that they are able to reduce this risk by allowing wide discussion, and if poor advice or research is provided, it is likely to be picked up by the other group members.

Recovery groups, however, need to be assessed within the social and political background to conservation. We would suggest that a recovery group's relevance may become increasingly important as a less centralized body of people takes a more active role in threatened species management. Implementing broader taxonomic or ecosystem groupings by DOC may ensure a greater coverage of threatened taxa within NZ, but also risks downsizing the skill base and representation for any one species. We encourage those developing the new groupings of threatened taxa to consider how this change will take into account: (i) detailed recovery planning for a species that is found in multiple administrative regions (conservancies) and between DOC-managed projects and community conservation projects, (ii) allow meaningful relationships with private sponsors targeting single species and (iii) allow continued or expanded science transfer from academia.

We view the role of applied science in evidence-based conservation as particularly important. What are the perceived barriers for effective evidence-based conservation? How useful is applied conservation research from academia to on-the-ground species managers? Do managers listen, are academics answering the right questions or speaking the right language? Our aim here is to investigate both the relevance of recovery groups and how they can act as an important conduit for science into management. We do this by focusing on one highly active and diverse recovery group for the NZ hihi (or stitchbird) *Notiomystis cincta.*

Hihi and the Hihi Recovery Group

Hihi are the sole member of an endemic passerine family that declined from northern NZ in the early 1800s to become restricted to a single offshore island (Hauturu) by about 1890. Starting in 1980, a series of translocations have been undertaken to reintroduce this species to offshore island and mainland island reserves. The latest suite of translocations have been to sites run by community-based conservation projects. As such, the Hihi Recovery Group (HRG) is made up of a mix of DOC employees, scientists from academic institutions and community group representatives.

Right from the earliest translocations of hihi, there has been an involvement of research (e.g. Angehr 1984). This partnership has developed such that most forms of management are underpinned by research (e.g. Armstrong, Castro & Griffiths 2007), and changes to management practice are monitored to determine how the change affects the population (e.g. Chauvenet *et al.* 2012). The HRG is diverse in its membership and as of early 2012

consisted of 28 members comprising representatives from DOC (28%), community conservation groups (32%) and researchers based in academic institutions (40%). In comparison with other NZ recovery groups, the HRG is unique in being the largest in size and the only group to have a dominant proportion of academic researchers that reflects the strong science-based management (Table 1).

Despite a substantial proportion of academics in the HRG, it remains unclear how well their research is aligned with the needs for conservation, how approachable their research findings are for the nonacademics in the group and just how valued the scientific contribution is to hihi conservation. This reflects many stereotypes existing in applied ecology literature. How useful is science for conservation? What barriers may inhibit evidence-based conservation? Anecdotally, the HRG has been viewed highly by DOC. Understanding what works well in this recovery group, and what challenges remain, is important for promoting how recovery groups may allow evidence-based conservation to underpin national directions for species recovery.

For these reasons, we asked the HRG members to provide their own opinions on the importance of recovery groups, the importance of academic literature on hihi and the value of science to conservation. We used two approaches to gather these opinions. We sent a questionnaire to HRG members and held a workshop attended by both academics and managers from all hihi populations (DOC and community groups). Seventeen HRG members responded to the questionnaire (61%; with a 52% academic, 48% nonacademic split). Twenty-one people attended the workshop of which 13 were HRG members and the remaining eight were scientific colleagues of HRG members, or DOC and community group representatives who contribute to hihi conservation (38% academic, 62% nonacademic split). The opinions we present therefore provide a voice from a wide grouping of stakeholders and contrast to the findings presented by Seabrook-Davison, Ji & Brunton (2010) that reflect only DOC employees. Importantly, this contrast also captures the uniqueness of the HRG over other species recovery groups in NZ in being the only recovery group with an absolute minority membership of DOC employers (Table 1).

Are recovery groups important?

There was unanimous agreement that the HRG is important for hihi conservation. Respondents and meeting attendees noted that it brings together key individuals and organizations and includes most stakeholders. It allows detailed discussion on a wide range of views and allows recommendations based on the national recovery strategy. Importantly, it was noted by one DOC employee that 'it provides a central group of knowledgeable people to discuss issues with' and from one community group representative that 'this is about cutting-edge research-based management, where significant progress is made every year'. Most questionnaire respondents also considered that the advice given by the HRG was well received (59%) and well implemented (53%) with the others not being sure for various reasons.

The diverse background of HRG members was also viewed unanimously as beneficial, and only one questionnaire respondent thought the balance of different stakeholders was not good (in this case, a DOC employee thought there were too few DOC managers). One community group representative noted that 'it is great that we are not told what to do or what is going to happen without consultation and our opinions are always sought and, I think, seriously considered'. Certainly, all questionnaire respondents and meeting attendees thought hihi recovery nationally could not be better served without the HRG. Finally, all agreed that the HRG would become increasingly important as DOC's resource commitment to hihi conservation declined, and communities took more ownership in the management of hihi. There was a strong message tabled at the workshop suggesting that a HRG would continue to exist even if DOC officially stopped coordinating it. However, many viewed it as the NZ government's responsibility to manage hihi and that it would be unacceptable should they not continue to do so.

As the NZ government reconsiders the most efficient way to conserve biodiversity, we must keep in mind the things which have worked in the past. Single-species-based recovery groups may be narrow in focus, but this is sometimes required where challenges are case-specific and difficult to resolve. Hihi fit this scenario in being difficult to manage (Taylor, Castro & Griffiths 2005). The responses from the HRG differ from a more general view that NZ recovery groups currently fail to achieve a successful national approach to species conservation, as perceived by DOC employees (Seabrook-Davison, Ji & Brunton 2010). Each group has a different method of operation, and the key strengths of the HRG are (i) a diverse and inclusive stakeholder membership, (ii) annual face-to-face meetings and an active email list and (iii) clear goals, agreed by all stakeholders and clearly articulated in both the Hihi Recovery Plan (Taylor, Castro & Griffiths 2005) and in annual HRG meeting minutes.

The emergent feeling from the HRG is one of the collaborative advancement of relevant and tested management. This appears to have overcome one of the major criticisms of an earlier evaluation of species recovery groups within DOC showing a lack of a unified approach (Seabrook-Davison, Ji & Brunton 2010). The same DOC organizational structure constrains all recovery groups, yet the HRG is somehow able to channel the enthusiasm, resources and knowledge of diverse stakeholders and more effectively drive a national strategy. Energy in this form can be somewhat ephemeral. It should be fostered wherever possible, but DOC should also proactively work to allow more feasible structural approaches to species management. The current method of providing a gun (recovery group) and no ammunition (no accountability for

managers not taking up recommendations) appears poor. Further, the current disjunction between recovery groups, national strategy and community conservation must be addressed in current restructuring of threatened species recovery strategy.

Recovery groups as a conduit for evidence-based conservation

APPROACHABILITY AND UTILITY OF SCIENTIFIC LITERATURE ON HIHI

There is a common adage that academic research papers are read only by scientists and not those working in the field to conserve species (e.g. Goulson *et al*. 2011). In contrast, we found that only one respondent (DOC employee) had never read an academic paper about hihi. Of the remainder, all but one had read their most recent article within the last 12 months. There may well be a good reason for the approachability of scientific articles about hihi to managers. The HRG has a substantial academic membership. Articles are readily made available to all in the group, which removes the barrier to access. This is best shown by academic respondents noting that they predominantly obtain articles via their institutional e-journal access, whereas nonacademic respondents almost exclusively obtained articles via the recovery group. Simply put, the academics are making sure their findings are made available to the managers via the recovery group.

Academics are also sometimes criticized for being unapproachable and producing jargon laden work, far too technical for the applied manager or lay person to grasp. The feedback from the HRG on this was mixed. Certainly, the majority of respondents (77%) found the hihi literature interesting and of use to conservation of the species. Three respondents (2 academic and 1 DOC) noted that the literature was somewhat variable in its interest and use. Perhaps it is of concern that seven of the eight nonacademic respondents generally accepted conclusions as reliable and focused only on the abstracts and discussion sections. However, accepting conclusions from published articles is perhaps still better than similar judgements based on unpublished reports. Although not foolproof, the peer review process does act as a quality control of (ideally) reliable research findings. Academics should promote this as a valuable component of publication of applied research.

Nonacademic HRG members are more critical at another level. Simply adding the claim to a publication that 'our findings have important conservation implications for hihi' does not work. Only 18% of respondents thought that all publications were important, whereas all others needed to see, within the article, an explanation of how the findings will, or have been, be important for hihi conservation. This feeling is reiterated if we only look at nonacademic respondents with only two of eight thinking all publications on hihi were important. This indicates that most HRG members want to see the applied nature of the publications thoroughly explained. This is a fair claim and one that academics should guard against when trying to make their work fit a conservation context.

To help provide explanations of findings, all but two academic respondents thought it would help to have a lay summary to accompany any article. Furthermore, it was noted at the workshop (by a DOC employee) that 'field personnel still often need a translation process and that was traditionally the role of technical support officers within DOC. DOC has recently made these positions redundant, and community conservation groups largely lack such specialist employees. Thus, we have an increasing shortfall of dedicated translators…'. Lay summaries should not be the sole solution, however, and aspects of the HRG that contribute to the accessibility of academic research include formal and informal discussions, email groups, newsletters and private networking.

PERCEPTIONS ABOUT THE VALUE OF SCIENCE TO HIHI CONSERVATION

We posed a series of provocative questions based on the stereotypes of managers and scientists. Our aim was to judge how real these are. Certainly, at least three academic HRG members believe the dichotomy between science and management is largely artificial and that it is in no way practical to manage anything in the absence of explicit theory.

From the perspective of the HRG, there is strong optimism for the role of science in management. For example, eight (47%) respondents disagreed with the statement 'there is an absence of communication between scientists and the public relating to conservation of hihi'. Yet, four respondents (24%) agreed with this statement and the remainder were unsure or neutral. Similarly, 14 respondents (82%) disagreed with the statement 'there is a huge gulf between scientific knowledge and practical on-the-ground conservation of hihi'. Other respondents were unsure or neutral. When asked whether 'researchers are driven by their desire for data and papers rather than for what is best for hihi', 10 respondents (59%) disagreed, only one agreed and the remainder were unsure or neutral. Finally, 14 respondents (82%) disagreed with the statement 'researchers don't live in the real world, and so their contribution to conservation is limited'. Our workshop highlighted other positive viewpoints towards academic research. One nonacademic community group representative stated: 'I have quoted a number of people around this table to get funding and acceptance of translocation, because those decisions tend to be made by people who respect the findings of research carried out by academics,… I think your research provides protection against foolish action in the field'.

There was also a caution to academics. When asked whether 'managers should listen more to what researchers say because researchers know best', ten respondents (59%) disagreed and only one agreed. There was also

mixed response to the statement 'managers are just as responsible to ensure they understand and implement researchers' recommendations, as researchers are responsible to ensure their research is communicated to managers' with 10 (59%) in agreement, four (24%) disagreeing and the remainder unsure or neutral. It was also wisely pointed out by one academic attendee to the workshop that 'it is not always right for a single academic study to immediately result in a change of management, as the scientific method often requires time to critically evaluate and test findings to eventually form a robust consensus'. Finally, in a twist on a statement made in an earlier practitioner's perspective (Goulson *et al*. 2011), we asked whether 'publishing a scientific paper, no matter how good the science may be, does not in itself improve the fortunes of hihi'. The response was as the following: eight (47%) agreed, six (35%) disagreed and two were undecided.

Future challenges for evidence-based conservation

We believe that most can see the logic in evidence-based conservation and that this has been the case ever since there have been managers. Reusing what worked and dropping what did not. This isolated approach can be viewed, however, as highly inefficient in the modern age where numerous threats are shared and technology allows rapid dissemination of tests of methodology. Applied conservation science should be applauded as forming a body of specialists skilled in developing and testing conservation methodology, then reporting this to a wide audience, importantly including conservation managers.

However, academics have a job to do. Their core role is to publish good papers based on solid research. It may sound simple to the uninitiated, but this is a challenging task (Cassey & Blackburn 2003). Academics are also increasingly asked to make their work count to a wider society, as a publication in itself does not make the research applied or applicable. Managers also have a job to do. Constraints of limited funds often mean they are stretched, and reading papers is often (mistakenly) viewed as a luxury. For both academics and managers, there are no set rules on which to judge their success in outreach and interaction with each other. We have found that the recovery group format can directly assist this. Any inclusive group which sits managers and academics at the same table to discuss conservation problems is far more likely to succeed in on-the-ground benefits than relying on managers and academics working independently.

There is, however, a continual need to evaluate the two-way transfer of questions and answers. Options ranging from informal presentations, lay summaries and including managers within research development were all tabled at the workshop or supported within the questionnaire. Technology is also facilitating new forums for knowledge transfer and storage. Websites are becoming a norm for academic projects (e.g. www.hihiconservation.com), and Facebook and Twitter (follow us @hihinews) create an informal medium to ensure academic outputs are readily accessed. These technological advances also allow scientists to better participate in the wider publicity required to raise the public profile of a threatened species. In short, academics who want their work to mean more than increasing a publication list need to engage directly with managers, through forums such as recovery groups, and take advantage of new ways to make their work count.

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Received 16 November 2012; accepted 29 January 2013
Handling Editor: Philip Hulme

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