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SHORT RESEARCH ARTICLE

Findings from a survey of wildlife reintroduction practitioners [version 1; referees: 2 approved, 2 approved with reservations]

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Abstract

Wildlife reintroduction programs are a type of conservation initiative that seek to re-establish viable populations of a species in areas from which they have been extirpated or become extinct. Past efforts to improve the outcomes of reintroduction have focused heavily on overcoming ecological challenges, with little attention paid to the potential influence of leadership, management, and other aspects of reintroduction. This 2009 survey of reintroduction practitioners identified several key areas of leadership and management that may deserve further study, including: (i) the potential value of reintroduction partnerships for improving programmatic outcomes; (ii) the potential management value of autonomy vs. hierarchy in organizational structure; (iii) gaps in perceptions of success in reintroduction; and (iv) the need for improved evaluations of reintroduction programs and outcomes.

Open Peer Review

Referee Status: ? ✓ ? ✓

	Invited Referees 1	2	3	4
version 1 published 29 Jan 2014	? report	✓ report	? report	✓ report

1 **David Norton**, University of Canterbury New Zealand

2 **Gary Luck**, Charles Sturt University Australia

3 **Ryan Chisholm**, National University of Singapore Singapore

4 **Mary Blair**, American Museum of Natural History USA

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The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing interests: No competing interests were disclosed.

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Objectives

In the fight to preserve global biodiversity, conservationists and biologists must make use of every available tool and approach. Reintroductions are a type of triage initiative; a last-ditch intervention when every other effort to keep a species present within its historic range has failed. They are employed *only* in cases of significant biodiversity loss, and are subsequently operating under more dire conditions than any other type of conservation initiative. Regardless, they maintain a low success rate, estimated in the past 12 years between 26% and 32% (Fischer & Lindemeyer, 2000; Jule *et al.*, 2008). Efforts to improve this success rate have focused heavily on improving biological knowledge as an avenue toward greater success. However, we suggest that another, overlooked, area of significant influence might lie in the human dimensions of reintroduction - specifically, the types of leadership and styles of management under which reintroduction programs are operated. Reliable data on reintroduction management is limited and restricted almost entirely to the gray (i.e. informally published) literature, with the exception of (Clark & Westrum's, 1989) paper on high-performance teams in wildlife conservation. This is unfortunate, as a slightly greater emphasis on the human dimensions of reintroduction would be to the benefit of both ecological and human communities. To that end, this survey is an exploratory effort to gain information about simple trends in reintroduction management and praxis, with the goal of informing future studies in this field.

Methods

This survey was designed as an online-only, 47-question survey, presented via email between April and May 2009 and requiring approximately 20 minutes for completion. Emails of reintroduction practitioners were collected from the IUCN Reintroduction News online newsletter, the Reintroduction News Directory of Practitioners, and from the author contacts of reintroduction publications between 1999 and 2009, found through Google Scholar. There was no bias in participant selection relating to species, size or length of project, or budget. Invitations to participate in the survey were sent via email to 401 reintroduction practitioners worldwide.

Survey design

The survey was designed subsequent to a case study of the leadership and management of the Sea Eagle Recovery Project, undertaken from May 2008 to August 2009 (Sutton, unpublished data). The six sections of the survey included two introductory demographic sections and four project-based sections, within which questions were designed based on observations made during the 2009 case study. These sections were: (i) About Your Project, (ii) About You and Your Position, (iii) About Organizational Structure, (iv) About Goal-Setting, Meetings and Evaluation, (v) About Public Relations and Outreach, and (vi) About Success and Performance. General trends and descriptive statistics were drawn from the data using Qualtrics website software (Qualtrics, 2009).

Results

Sixty-eight (16.95%) invitees responded to the survey. An additional 40 (9.98%) responded to email invitations and stated that (a) they no longer worked in the field; (b) they had only conducted retrospective analyses of reintroduction and not participated in a program; or (c) they did not, for other reasons, wish to share their experiences. An additional 25 (6.23%) were not contactable by email (i.e. email addresses were outdated). The remaining 268 invitees (66.83%) did not respond. Reminders were sent to invitees at the two-week and one-month mark.

Respondent demographics

Most respondents (45.95%) had served as senior employees or founders of reintroduction programs (Figure 1), with the majority of respondents (62.16%) also reporting less than three years' experience at the time they took on that role with the reintroduction program (Figure 2).

Reintroduction phases and lengths

Questions about phase length revealed four reintroduction phases: (1) planning, (2) approval, (3) action, and (4) monitoring. "Planning phase" referred to the period of time used to conceive and plan the reintroduction project. "Approval phase" referred to the period of time used to gain permission from government agencies or leading organizations to reintroduce the focal species. "Action phase" referred to the period of time during which animals were actually captured, captive-bred, raised, and released into the wild. "Monitoring phase" referred to the period of time during which reintroduced animals were monitored post-release.

Results indicated that planning phases most frequently took one to three years, while approval phases typically took nine months to

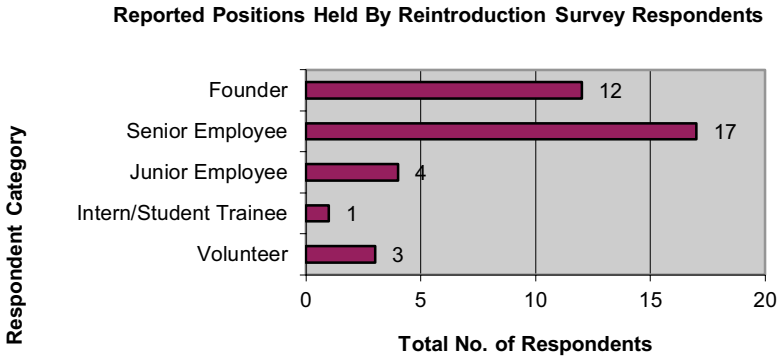

Figure 1. Reported positions held by reintroduction survey respondents.

Figure 2. Reported years of experience with wildlife reintroductions among survey respondents.

one year. Both action and monitoring phases most commonly took more than four years (Figure 3).

Task supervision and organizational structure

Respondents indicated that tasks were 'rarely' monitored, either directly (43.24%) or indirectly (30.56%), by supervisors (Figure 4). Most respondents (32.43%) self-assessed their program as having been "somewhat autonomous"; however, a nearly-equivalent number self-assessed their program as having been "autonomous" (21.62%) or "very autonomous" (27.03%) (Figure 5). Most respondents also indicated that their assigned tasks and responsibilities were "frequently" shared with coworkers (47.22%).

Respondents most frequently reported two levels of authority existed between the most senior and most junior employee, and one level of authority existed between the most senior volunteer and most junior volunteer (Figure 6). Most respondents (48.49%)

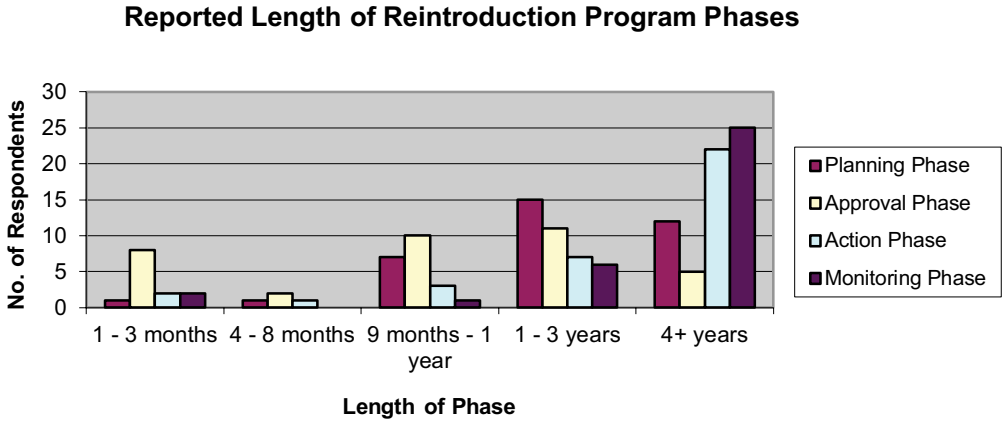

Figure 3. Reported length of reintroduction program phases.

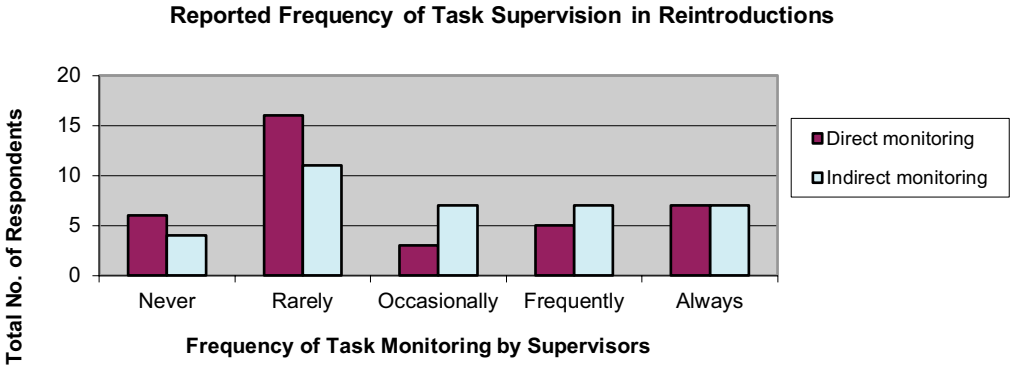

Figure 4. Reported frequency of task supervision in reintroduction programs.

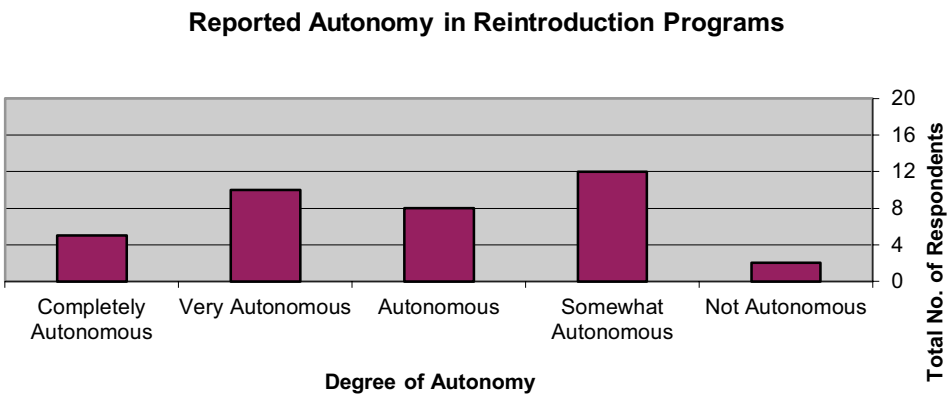

Figure 5. Self-assessed autonomy in reintroduction programs.

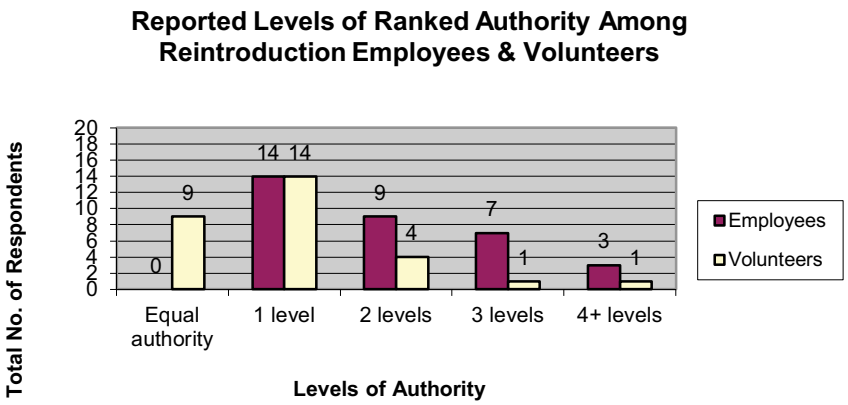

Figure 6. Reported levels of ranked authority among reintroduction employees and volunteers.

self-assessed their projects as having been "somewhat hierarchical" (Figure 7).

Meetings and goal-setting

The majority (56.00%) of all-staff, general meetings within reintroduction projects took place annually (Figure 8). Most meetings that specifically aimed to establish, modify, or augment goals for the project were held annually to discuss long-term goals (57.58%) and monthly to discuss short-term goals (54.55%) (Figure 9).

Evaluation

The majority of respondents reported evaluations of employee performance as an annual event (64.52%), as were evaluations of overall program outcomes, both by internal employees (71.88%) and external authorities (41.38%) (Figure 10).

Public relations and outreach

Most programs had no staff dedicated solely to public relations/media affairs (67.65%) or public education and outreach (64.71%) (Figure 11). Respondents indicated that projects were most likely to form partnerships with national wildlife organizations (77.42%) or local community groups (77.42%), and least likely to partner with corporations/businesses (43.75%) or other reintroduction programs (45.45%) (Table 1).

Success and progress

Most respondents self-assessed their projects as having been a success (57.14%); most also reported a formal evaluation as having determined that their project had been a success (62.86%). A wide majority of respondents self-assessed their project as having "made good progress" (74.29%); most also reported that a formal evaluation had determined their reintroduction to have made good progress (60%) (Figure 12, Figure 13).

Responses from a survey on leadership and management issues by wildlife reintroduction practitioners

1 Data File

http://dx.doi.org/10.6084/m9.figshare.904908

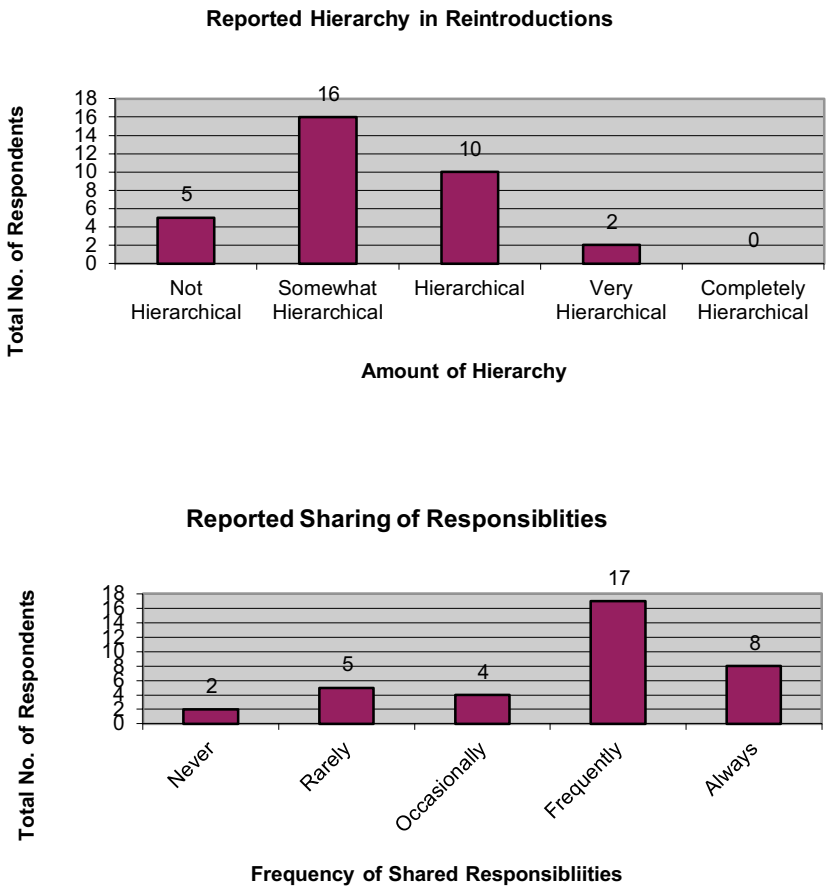

Figure 7. **Self-assessed hierarchy in reintroduction programs.**

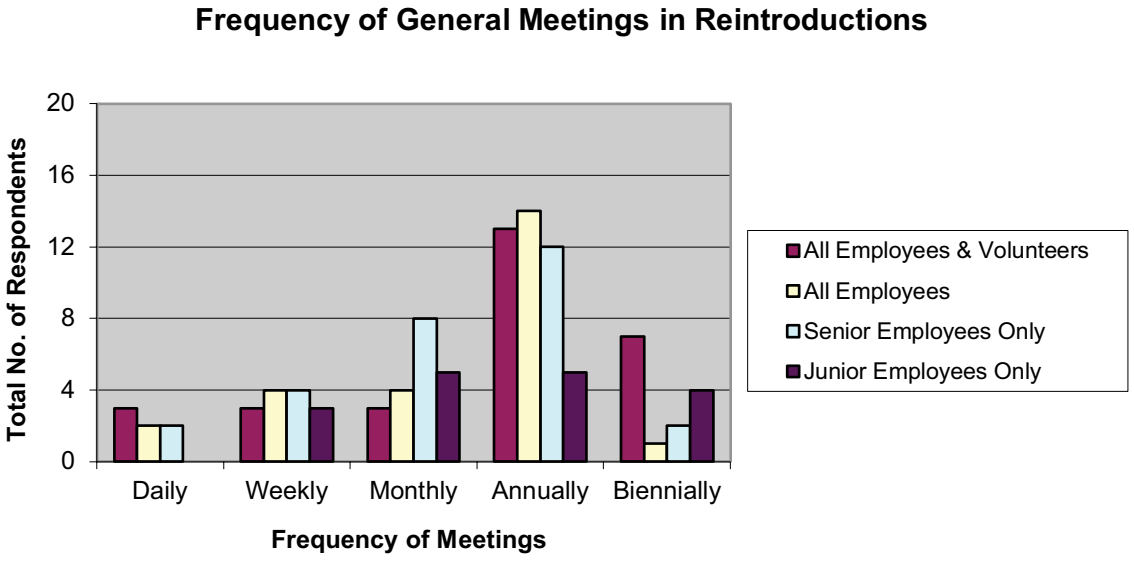

Figure 8. **Reported frequency of general meetings in reintroduction programs.**

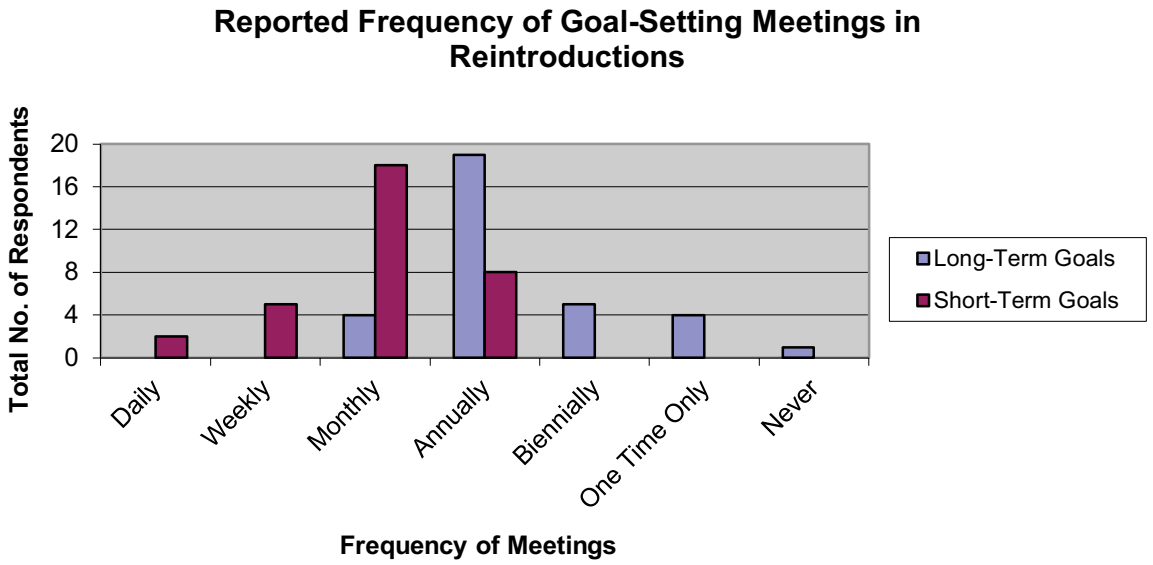

Figure 9. Reported frequency of goal-setting meetings in reintroductions.

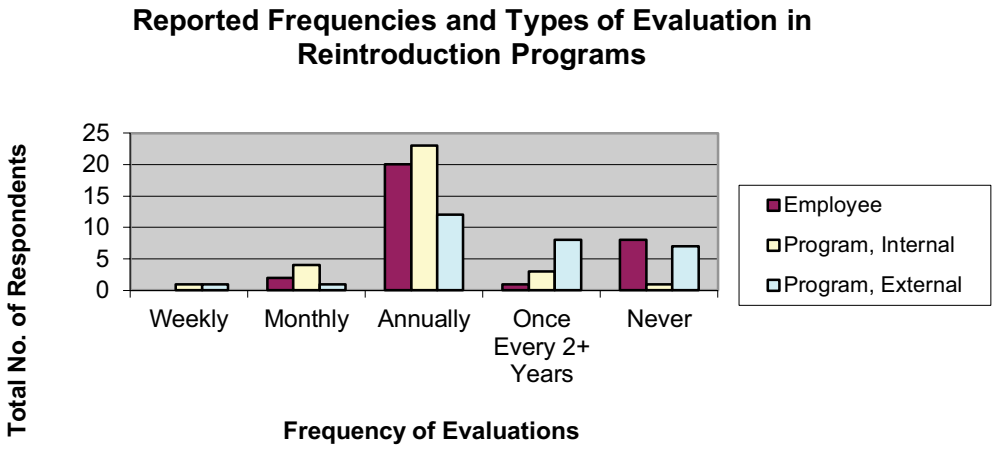

Figure 10. Reported frequencies and types of evaluation in wildlife reintroduction programs.

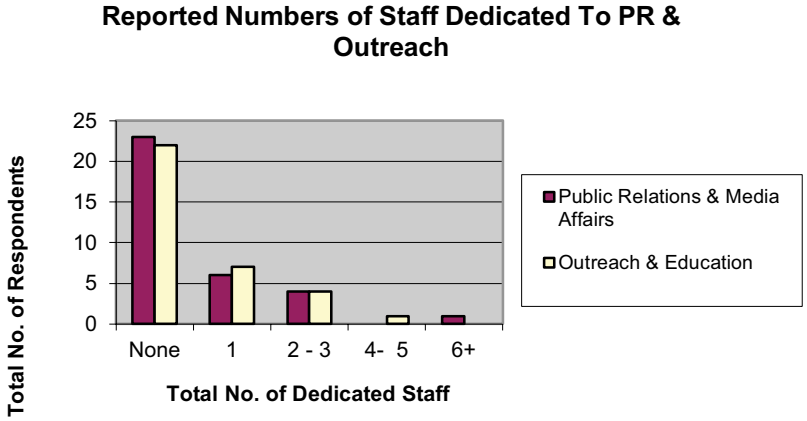

Figure 11. Reported numbers of staff dedicated to public relations and media affairs or public outreach and education.

Table 1. Reported partnerships of wildlife reintroduction programs.

Type of media	No partnerships	1–2	3–4	5–6	7+	Total projects reporting partnerships
Newspapers, magazines, or other forms of print media	9	13	8	0	2	23
Television/radio stations or other forms of audiovisual media	13	12	6	0	0	18
Websites, blogs, or other forms of internet media	13	13	5	0	1	19
Primary schools	13	6	3	0	8	17
Secondary schools	14	5	5	2	5	17
Colleges/Universities	10	12	3	3	2	20
International wildlife or conservation organizations	11	13	6	0	1	20
National wildlife or conservation organizations	7	14	9	1	1	24
Regional, local, or community organizations	7	10	7	3	4	24
Naturalist or local wildlife enthusiast organizations	11	11	4	3	3	21
Other reintroduction programs	18	10	3	1	1	15
Corporations or businesses	18	8	4	1	1	14

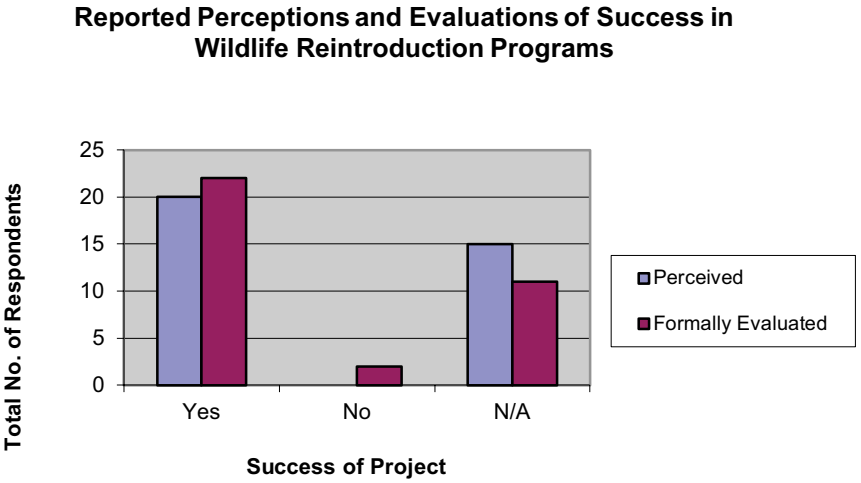

Figure 12. Self-assessed and evaluated success in wildlife reintroduction programs.

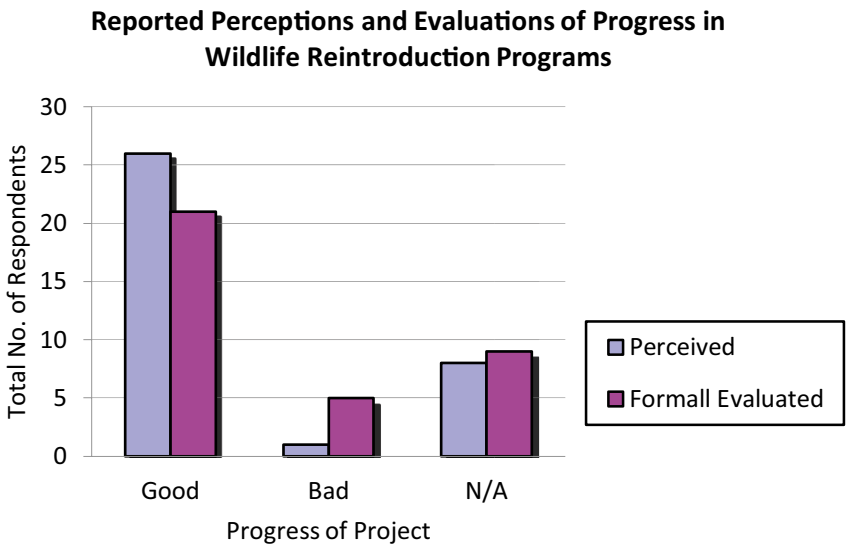

Figure 13. Self-assessed and evaluated progress in wildlife reintroduction programs.

Discussion

The survey results show several trends in reintroduction management and reveal a multitude of gaps in knowledge and management practice. The clear gaps in knowledge, expertise, partnerships and evaluation yield a bevy of interesting questions for further study – and demonstrate the lack of a best practices management protocol in this field.

Expertise gap: despite respondents' high-level roles as reintroduction founders or senior officers, they typically lacked reintroduction experience. Most respondents reported less than three years' experience at the time they took on high-level roles; this is the same length of time typically required for planning and approval for a reintroduction, according to respondents' reports. This overlap indicates that the majority of reintroduction founders and executives responding to this survey had never witnessed the full planning-approval-action-monitoring process of a reintroduction at the time they were placed in charge of one.

Partnership and knowledge-sharing gap: overall, respondents reported very limited engagement between their reintroduction and partner organizations of any type. Partnerships that were reported skewed heavily toward national wildlife or conservation organizations and national news outlets, and very few partnered with either businesses or other reintroduction programs. The former gap is a missed opportunity to engage corporate partners in conservation and build a stronger sponsorship base for local projects; the latter may indicate a tragic lack of connectivity between parallel projects, and hints at a likelihood of redundant work and "learned lessons" that go unshared.

Evaluation gap: the lack of established, recurrent evaluations conducted by external authorities was lamented by (Kleiman *et al.*, 1999) in all areas of conservation, and is only too evident here. A trend toward frequent, informal, internal evaluations means that rigor is decreased; this decrease in rigor and shift toward informality has been recognized as a challenge to maintaining the value of program evaluation across all types of organizations (Roch & McNall, 2007). This type of weaker evaluation can lead to a loss of accurate perceptions, as suggested by the gaps between respondents' self-assessment of their programs' success or progress and the results of formal evaluations.

Although the success-perception gap in our survey was not large (a 5.72% difference), the progress-perception gap was nearly triple (14.29%), and respondents reporting that they believed good progress had been made were common than those reporting that they believed success had been met (74.29% vs. 57.14%). This may suggest that respondents have a poor understanding of how to recognize markers of progress that lead to success – a problem that weak evaluation would only exacerbate.

Summary

This survey, although preliminary, provided insight into several areas of conservation leadership and management that could be focal areas of future study. Understanding the gaps in expertise and evaluation, as well as the missed opportunities in partnership and knowledge-sharing, could be hugely beneficial in the future improvement of project management and reintroduction outcomes.

Author contributions

Both authors contributed extensively to this work. A.E.S. designed and distributed the survey instrument and conducted analyses. R.L. advised the development of the instrument and interpretation of

results. Both authors discussed the results and implications and commented on the manuscript at all stages.

Competing interests

No competing interests were disclosed.

Grant information

We would like to thank Texas A&M University and the MSC L.T. Jordan Institute for International Awareness, for providing support for Alexandra Sutton's research travel through the Jordan Fellows Program.

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Acknowledgements

We would like to thank Drs. Gillian Bowser, Gerard Kyle, and Jean Madsen for their input and guidance.

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PubMed Abstract | Publisher Full Text

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Current Referee Status: ? ✔ ? ✔

Version 1

Referee Report 14 February 2014

doi:10.5256/f1000research.3483.r3422

✔ **Mary Blair**
Center for Biodiversity and Conservation, American Museum of Natural History, New York, NY, USA

This short research paper presents the results of a survey of wildlife reintroduction practitioners. The paper is well-written and the results have relevance to future studies, but I suggest several revisions to further improve the paper.

In the Summary, the authors state that the results provide insight into areas of conservation leadership and management, although the article really only focuses on reintroduction programs specifically. There are many ongoing discussions in the wider conservation management arena about leadership and evaluation of success and it might be important to give the paper some more context in relation to those ongoing discussions (e.g. by referring to Black & Groombridge 2010 Conservation Biology, several publications related to the CMP Open Standards http://www.conservationmeasures.org/initiatives/standards-for-project-management, Manolis *et al.* 2009 Conservation Biology).

Also, further discussion on what sorts of responses to other questions resulted in a perception of "success" in a given program would greatly strengthen the claims of the paper. To do this the authors could add a correlation analysis among variables, or, perhaps the authors could detail a few case examples?

Minor comments:

- In the Methods, it is stated that the survey was sent to practitioners worldwide, but of the 17% that responded, was there bias in terms of the countries respondents represented? A bit more elaboration on the potential of bias in the survey results (both geographic and other kinds of bias) would strengthen the paper.
- It would be very informative for future studies to include the survey instrument itself as an appendix.
- Table 1. It might be more informative if values in this table were represented as percentages or proportions to better illustrate the claims in the discussion section about how partnerships are "very limited" or "very few" with businesses or other reintroduction programs.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Competing Interests: No competing interests were disclosed.

Referee Report 13 February 2014

doi:10.5256/f1000research.3483.r3425

Ryan Chisholm
Department of Biological Science, National University of Singapore, Singapore, Singapore

The authors have conducted a survey of reintroduction practitioners and they have analysed the distribution of different project statistics, such as degree of autonomy of and frequency of meetings. They also present data on project success rates.

These data will no doubt be useful to people working in the field. I was surprised that the authors did not investigate whether any of the other factors, e.g., frequency of meetings, was correlated with project success. They obviously have the data to look at this. Why didn't they?

Minor comments:

- p2: "Lindemeyer" -> "Lindenmayer"
- p2: Citation formatting: "Clark & Westrum's (1989)"
- p7: Heading of column 2 in Table 1 could just be "0", because otherwise it could be read as "number of partnerships".
- p8, Figure 13: "Formall Evaluated" -> "Formally Evaluated"
- p8: Citation formatting again: "Kleiman et al. (1999)"

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Competing Interests: No competing interests were disclosed.

Referee Report 13 February 2014

doi:10.5256/f1000research.3483.r3423

Gary Luck
Department of Wildlife Ecology and Management, Charles Sturt University, Albury, NSW, Australia

General comments

I agree with the authors that much of the assessment of reintroduction success is focused on the ecological aspects of reintroduction programs, with little attention paid to how humans manage reintroduction programs. I agree also that some of these management aspects can be critical to program success, although I think the authors could have elaborated on this in more detail in the Introduction (Objectives) section. A survey of wildlife practitioners involved in reintroduction programs is therefore a

useful addition to the literature.

The study employs a fairly basic survey instrument delivered via email. More information on the survey instrument (design, types of questions, justification for questions included etc.) could have been provided, including a copy of the survey published as supporting information. The response rate to the survey was low, and I wonder if this introduced any biases to the results? Finally, the Discussion doesn't really elaborate on how the trends in the responses might actually impact on the success rate of reintroduction programs. Would greater expertise lead to more success? How much expertise might be needed and in what areas specifically? Would more partnerships with corporate bodies actually improve reintroduction success? Why?

Specific comments

Objectives:

- For the sentence '*Regardless, they maintain a low success rate, estimated in the past 12 years between 26% and 32%*' it would be instructive to know how the cited authors measured 'success rate'.
- This section could include a more detailed argument regarding why 'types of leadership' or 'styles of management' are likely to be so important to reintroduction success.

Methods:

- Change '*Emails of reintroduction practitioners…*' to 'Email addresses of…' to avoid confusion.
- '*There was no bias in participant selection relating to species, size or length of project, or budget*.' - Were practitioners asked about these things? It would have been instructive to know the spread of responses (e.g. types of species dealt with).

Survey design:

- It would be useful to include more information about survey design including a copy of the actual survey published as supporting information. Additional information could include details of question design and type, and justification for inclusion.

Results:

- Did the low response rate lead to any biases in the results?

Task supervision and organizational structure:

- Please define 'autonomous' in this context.

Success and progress:

- Again, a short definition of 'success' would be useful here. Was a definition included in the questionnaire or were practitioners just asked something like 'Was your project successful?' and just left to self-define the meaning of 'success'?

Discussion

- A broader discussion of how specific results might influence reintroduction program success would be highly beneficial and help guide future research in this area.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Competing Interests: No competing interests were disclosed.

Referee Report 05 February 2014

doi:10.5256/f1000research.3483.r3424

David Norton
New Zealand School of Forestry, College of Engineering, University of Canterbury, Christchurch, New Zealand

This is an interesting short note that addresses a useful question. While it is true that environmental factors play a key role in limiting the success of reintroduction programmes, management and leadership factors could also be an important issue. This note sought information on this issue through a survey of people involved in reintroduction programmes. I think the two key conclusions from this survey are useful, that there is a lack of long-term experience amongst those undertaking reintroduction programmes, and that there is a lack of formal evaluations of these programmes. This latter point also links to the observation that there is a lack of linkages between different organisations and different reintroduction programmes.

There were, however, some issues that I felt did require further attention: I was unclear what the focus of the survey was - was it just in the USA or was it wider? This should be clarified. Was there a bias in the responses in that perhaps only those that had been involved with more successful reintroduction programmes responded? The survey results indicate success rates of around 60% which is much higher than the 26-32% cited in the Objectives section. This should be discussed further. I would also have liked to have seen more discussion in the conclusions on how the results of this survey might be used. How might these results be taken up and used to improve future re-introduction programmes? I also felt that the paper had too many figures and wondered if some of these could be removed with just the key results presented in the text (or perhaps tabulated). I thought the abstract was a good summary of the article, but was unclear what the difference is between extirpation and extinction.

I have read this submission. I believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Competing Interests: No competing interests were disclosed.