



IUCN/SSC Re-introduction Specialist Group (RSG): www.iucnsscrsg.org



Letter from the Chairman

Dear RSG members,

It seems a long time ago when we drafted the current RSG guidelines. Since then the context for species conservation has changed profoundly and grows ever more complex. RSG is now embarking on revisiting the re-introduction guidelines and producing new guidelines for the IUCN-SSC that take into account the current context for species conservation. We work in a world where conservation work is being undertaken within the context of rapidly diminishing critical habitats, the decline of key ecosystem services, the increase in invasive species and pathogens, and the effects, both observed and projected, of climate change.

In our existing guidelines we refer to “historical range” as an over-arching guiding factor. We assumed that a knowledge of historical range provided a context for future management—namely the restoration of populations to a recorded historical location in a more or less stable climate. This somewhat comforting concept is being increasingly challenged. For instance “assisted migration”, the translocation of species to locations outside of the natural or historical range, was a minor consideration in the existing guidelines (“benign introductions”). The adoption of approaches such as “assisted migration” immediately moves our work, the conservation of a threatened species, and awkwardly places into the arena of debate about alien and invasive species (those species outside of their designated “natural range”). The debate is ongoing and species are being moved beyond their historical ranges. We recognize that the revision we are embarking upon is controversial and possibly a labyrinth of ethical, ecological and etymological debate (the world was so much simpler when we had to discuss whether reintroduction should be hyphenated!). However we also recognize that we need to tackle these issues.

I have asked Dr Mark Stanley Price to chair this working group. Mark, as previous chair of the RSG and an expert conservation biologist, will ensure this process of review is fully consultative, cross disciplinary, based on sound science and an understanding of the practical realities of conservation. Importantly Mark will work with the broad group of experts that operate beyond the SSC boundaries. Above all we are approaching this work with guarded optimism, while the challenges to conserving biodiversity have become more pressing we are also seeing new opportunities. Disciplines such as restoration ecology have matured and demonstrated enormous potency for the large scale conservation of biodiversity and ecosystem services - please see page 6 for further details regarding this initiative. I look forward to working with you on these new guidelines and further advancing the application of species re-introduction as a viable tool for retaining biodiversity.

Table of Contents:

Letter from Chair	1
RSG Section Chair Reports	2
Bird Section	2
Oceania Section	2
Meso- & South America	3
South Asia	3
Europe & North Asia	4
Reptiles & Amphibians	5
RSG Guidelines Revision	6
New IUCN translocation guidelines	6
General News Articles	7
Philippine threatened species	7
Birds	7
UK bird re-introductions	7
Guan re-introduction in Peru	9
Reptiles	9
Otago skink re-introduction in New Zealand	9
Mammals	10
Indian elephants: a twisted tale	10
Update on Australian Wildlife Conservancy	11
Indian one-horned rhinos	12
Plants	13
Reviewing plant re-introductions ...	13

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DISCLAIMER: The views expressed in this publication do not necessarily reflect those of IUCN.

2006-2008 Triennium Report: RSG Bird Section

I have maintained a register of nearly 100 contacts within the Bird Section of the RSG, using this volunteer network of expertise to facilitate information sharing and contacts by forwarding queries and specific requests for information. The profile of the RSG and of Bird Re-introductions was also raised through a number of initiatives taken by Bird Section members, principal of these was the convening of a Symposium on Avian Re-introductions hosted by the Zoological Society of London, in London, UK in 2008. This initiative was lead by Dr John Ewen of ZSL, and co-convened with Prof. Doug Armstrong, Kevin Parker and myself, and will result in a book of invited submissions to be published by Blackwell in 2011.

I have provided advice and/or directed queries to other RSG members for the following projects and organisations or agencies:

- Production of Galliforme Re-introduction Guidelines - Grouse Specialist Group and the World Pheasant Association;
- Pateke translocations - New Zealand Department of Conservation
- Bridled White-eye translocations - Northern Mariana Islands Division of Fish and Wildlife and the USF&WS
- Red kite re-introduction - The Hawk Conservancy Trust, UK
- Buff weka translocation - "Kaitiaki Runaka o te Ropu Weka", Ngai Tahu, New Zealand
- Gibbon translocations - Zoo Outreach Organisation, Tamil Nadu, India
- White-winged Guan re-introduction - Program de Conservacion Andes-Amazonia, Peru

I have given presentations representing my role in the RSG for:

- IV International Symposium on Breeding Birds in Captivity, Toronto, Canada, 2007
- 8th Annual Conservation Workshop for the Fauna of Arabia, United Arab Emirates, 2007
- 1st International Re-introduction Conference, Chicago, USA, 2008
- Symposium in Avian Re-introduction, London, 2008
- National Museum of Natural History, Paris, France, 2008
- Royal Society for the Protection of Birds, The Lodge, Sandy, UK, 2008

More personally:

I have been interviewed on two occasions for Science, on re-introduction biology and on black-footed ferret reintroductions, and for Tages-Anzier, Zurich on the

topic of re-introduction science.

I have been ask to review reintroduction related manuscripts for the following journals:

- Conservation Biology (4)
- Biological Conservation (2)
- Journal of Applied Ecology
- Animal Conservation
- Oryx (2)
- Bird Conservation International

I have also acted as external reviewer for re-introduction related grant proposals to the National Environment Research Council (NERC), UK. I have reviewed book chapter drafts relating to re-introductions for Blackwell Publishing, and for Chicago University Press.

Since 2006 I have included the IUCN/SSC RSG as part of my professional affiliation address in any relevant reintroduction-related publications in peer-reviewed journals.

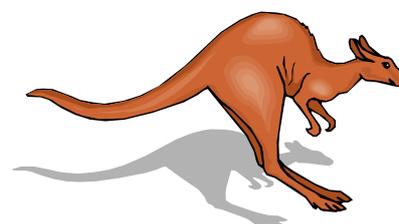
Philip Seddon

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2006-2008 Triennium Report: RSG Oceania Section

Within the Oceania Region, my main activities have been continuing to facilitate communication among reintroduction practitioners in the region, maintain the RSG Oceania website <http://www.massey.ac.nz/~darmstro/rsg.htm>, provide advice on various re-introduction projects, be an advisory member of the *hihi* recovery group and several ecological restoration projects doing multiple re-introductions, and be part of the working group revising the New Zealand Department of Conservation's Standard Operating Procedure for Translocations.

Phil Seddon and I also recently organized a symposium on assisted colonization at the Australasian Wildlife Management Society conference, and presented papers as part of the symposium. Internationally, Phil and I have published papers on "Developing the science of reintroduction biology" (*Conservation Biology* 21: 303-312) and "Directions in reintroduction biology" (*Trends in Ecology & Evolution* 23: 20-25) that were an outgrowth of our 2003 symposium on re-introduction at the International Wildlife



Management Society Conference and the 2002 RSG Strategic Planning Meeting.

With our colleagues John Ewen and Kevin Parker, we organized the an international symposium on avian reintroduction biology at the London Zoological Society that took place in May 2008, and are currently working on a multi-authored book on reintroduction biology to be published by Blackwell. I also attended and spoke at the international wildlife reintroduction conference in Chicago in April 2008 allow with several other RSG chairs.

I continue to run an active research program that mainly targets four key questions in re-introduction biology: 1) what management is required for reintroduced populations to persist? 2) what is the effect of inbreeding on long-term population persistence? 3) how intensively can source populations be harvested for reintroduction? and 4) to what extent can translocation be used to compensate for habitat fragmentation? We have published 22 journal articles, book chapters, and letters related to reintroduction biology from 2007-2009, and several of these are listed on my website <http://www.massey.ac.nz/~darmstro/rsg.htm>.

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2006-2008 Triennium Report: RSG Meso & South America Section

From 2006-2009 the RSG South-Meso America was involved in the creation of a re-introduction network in the state of Rio de Janeiro and a review of the Federal governments re-introduction guidelines. I also started a survey of re-introduction projects in south America and reviewed proposals for re-introduction projects.

In Brazil there is a sizeable illegal wildlife trade to meet both national and international demands. The Brazilian federal government (through IBAMA) and various state governments have increased the law enforcement efforts to curtail this illegal trade. This has resulted in thousands of confiscated vertebrates and a problem of destination of these animals. Some of the species confiscated are endangered but many are not. Triage centers are full. This resulted in many releases of animals in locations that are not within their native range and created another problem: invasive species. In order to bring some order into the releases a set of guidelines were developed and these are to be implemented through a law instrument. The RSG has participated in the development of those guidelines and in 2009 the document was still under

public review. This is the last stage prior to publishing the law instrument.



In 2005 efforts to create a network for re-introductions were initiated by the then coordinator of the IBAMA Triage center. In 2006 a series of meetings were organized by the Triage center and RSG to bring together representatives of the municipal governments (Secretary of the Environment) and NGOs interested in wildlife re-introduction. We were interested in identifying locations where animals could be re-introduced and which local facilities we could establish to hold animals prior to release. The idea is to use re-introduction of confiscated animals to establish local conservation projects that are based on science.

The RSG has been reviewing proposals for re-introduction projects. Most were bird species and some mammals (sloths and howler monkeys). I have noticed that several projects are not following guidelines and are intuitive rather than science based. Even though the release procedures were acceptable in terms of animal welfare and short term success, there were no plans to monitor or these plans were inadequate, and no plans to establish populations. This prompted me to begin a survey of the current projects to get an idea of how many projects related to re-introduction are being carried out. A questionnaire will be sent out this year to assess the methods and success of these projects.

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2006-2008 Triennium Report: RSG South Asia Section

In the last triennium RSG South Asia has conducted several meetings and trainings for a diverse group of zoo personnel, forest and wildlife officers, field biologists and other interested persons. One type of meeting is the one conducted jointly with the Conservation Breeding Specialist Group, South Asia network preceding the Annual conference of the South Asian Zoo Association. These meetings were conducted in Coimbatore, Tamil Nadu, India, 2006 (and no meeting in 2007), in Gandhinagar, Gujarat, India in 2008, and in Colombo, Sri Lanka in 2009. In these meetings we discuss local to regional issues pertaining to wild animal releases that are very current and of concern.

In Coimbatore, working groups were convened on “Troubled Translocations with special emphasis on primates”, and on “Guidelines for Rehabilitation” led by Mike Jordan who had been tasked by RSG to create a draft on the same. In Gandhinagar, the meeting was hosted by the Forest Department of Gujarat (Wildlife Wing), Gujarat. It drew a large number of wildlife and forest personnel leading to very stimulating sessions on creation/increase of prey base for large carnivores (Asiatic lion, panther) in Gir Forest, the Gharial Crisis and human animal conflict with special emphasis on leopard. In Colombo there were working groups on Small Mammals Re-introduction, release of zoo animals, and a small group on fish. In the coming quadriennium RSG South Asia will continue to have these annual meetings with CBSG and SAZARC. This year 2010 the meeting will take place in Nepal, in Chitwan National Park following the SAZARC meeting.

Also during the last triennium, RSG SA organized and conducted two “wild to wild” translocation training workshops with particular reference to Western Hoolock Gibbon (*Hoolock hoolock*). These workshops were both funded by the US Fish and Wildlife Service Great Ape Conservation Fund in collaboration with Wildlife Areas and Development Trust and the Assam Forest Department. Dr. Cecilia Kierloff, a Brazilian researcher who had successfully translocated dozens of Golden Lion Tamarins was our primary trainer, ably backed up by Mike Jordan (Atmos, U.K.) and Dr. David Chivers, Cambridge. The training was attended by participants from Hoolock range states in India and Bangladesh. After a few months, a similar training with brainstorming was conducted for senior foresters such as Chief Wildlife Wardens from India. Trainers Cecilia and Mike were joined by Dr. Frederick Launay for this session. Participants were guided in both workshops to adopt very specifically safe methods to avoid harming the animals, particularly by passing on disease or retaining the gibbons in captivity longer than absolutely necessary to prevent bonding with their captors.

In 2009 Section Chair, Sanjay Molur attended a meeting in Gauhati of Hoolock Gibbon specialists and enthusiasts to discuss next action steps after the two translocation training workshop conducted in Guwahati for conservation of Hoolock Gibbon. Selecting an “activer” for Hoolock Gibbon and approaching government for a Project Hoolock Gibbon were some of the major topics. In 2009 Sally Walker gave a presentation at the Annual Conference of Society for Conservation Biology SCB on precisely how to save Hoolock Gibbon from extinction with Project Gibbon and translocation.

South Asian Section Chairs are in the process of

putting together another training workshop to be held in this new quadriennium for translocation practitioners of this highly threatened, but distinctly salvageable taxon. This training would include details such animal handling in the process of capture for release and other fine tuning which, it has been discovered, is very much required.

South Asian Section Co-chair, Sally Walker visited Bhutan to deliver workshops themed on HECx, Human Elephant Coexistence. While in the country she was invited to comment and advise a Takin Preserve holding a small group of animals for public viewing as well as a somewhat larger group for breeding and potential release in situ. She made some suggestions regarding visitors, photo op gaps in fencing, visitor feeding and potential contamination of both groups. Also she suggested some changes in feeding procedure to limit association of provision of food with human beings for those intended for release. Suggested a training workshop covering a wide spectrum of topics from basic animal keeping, site evaluation/ selection to release protocols. The Nature Conservation Division of Bhutan is much interested in translocation and re-introduction as all their wild populations are “small populations” in a small but well vegetated country with 72+ percent forest cover, and will be a favored project for RSG SA in this quadriennium.

RSG South Asia section also has circulated a large number of documents and reports to the network of 45 experts and interested persons. A directory of these regional network members is in process and will be uploaded on the website www.zooreach.org in a few weeks time. Forty two members are from India and one each from Afghanistan, and (although not South Asian), Iran and UAE. We will be trolling for a better representation from the other South Asian countries this quadriennium.

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2006-2008 Triennium Report: Europe & North Asia Section Chair

The last Triennium has been a busy one for advising on release work with the Europe and North Asia region, and also for meeting and support to projects within Africa and South Asia regions.

Within the region a growing number of projects

continued to seek advice on plans, including work with the RSPB, English Nature, and the authorities in Holland, Poland, Spain and China. At any one time there are in excess of 200 planned release programs in the region, not including the massively growing number of translocations legally required for mitigation as part of developments, or the huge number of animals released each month as part of rehabilitation programs.

Advisory visits were made to work being carried out with Red Crowned Crane, Northern Bald Ibis, White-headed Duck, Barn Owl, Iberian Lynx, Water Vole, Harvest Mouse, Great Crested Newt, Sand Lizard, Limestone Woundwort, and many other species. We continued to play an instrumental role in plans for the strategy for Northern Bald Ibis by advising the International Advisory Group for Northern Bald Ibis (IAGNBI) on re-introduction projects and also the plans for an emergency supplementation in Syria. Comment and advice were given to planned Invertebrate guidelines with the UK, risk assessment of the repatriation of wildlife confiscated at airports and for rehabilitation programmes involving conservationally sensitive species. A large number of zoo projects both within and outside the region were given advice and the European Association of Zoos and Aquaria (EAZA) formed a Re-introduction Advisory Group under the co-chairmanship of the IUCN SSC RSG regional chair, to further improve communication between zoos and field projects.

Outside of the region; we continued to play a large role in work being carried out in sub-Saharan Africa, working with organisations such as the Endangered Wildlife Trust, IUCN SSC CBSG, BirdLife, Kenya Wildlife Service, Mabula Ground Hornbill Project and a number of smaller NGOs and zoos to give support and best practice guidance on planned re-introduction and supplementation projects. A large number of species are routinely moved as part of conservation programs, and RSG was especially involved in work planned on Wattled Crane, Southern Ground Hornbill, Southern Bald Ibis, Red-billed Oxpecker, Sable Antelope, Black Rhinoceros, Cheetah, Hunting Dog and a number of other species.

The close association with the South Asia region continued and support was given to the 2006, 2008 and 2009 regional meetings of the RSG and CBSG. Visits were made to India, Sri Lanka and Bhutan during the period and particularly advice was given at workshops for the Asian Lion, Western Hoolock Gibbon and small mammals. See the report of South Asia region for more information.

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2006-2008 Triennium Report: RSG Program Officer & Reptile-Amphibian Section Chair

During this triennium the RSG Secretariat has published 2 issues of *Re-introduction NEWS* issues number 25 (April 2006) and 26 (April 2007). The first RSG book *GLOBAL RE-INTRODUCTION PERSPECTIVES: Re-introduction case-studies from around the globe* was prepared in conjunction with the Environment Agency-Abu Dhabi, UAE and the Denver Zoological Foundation, USA in October 2008. The book contained 62 case-studies submitted in a standardized format. The book can be accessed in its entirety at http://www.iucnsscrg.org/rsg_book.php. A second book is currently in preparation and should be ready by late 2010.

A new RSG website was set up in 2007 by a professional web designer and besides having information on the group has an extensive downloads section where all RSG literature can be easily downloaded for free. The site can be accessed at: www.iucnsscrg.org.

The current RSG triennium saw the Membership Registration Database being integrated into the RSG website and all members have registered on the website with their details. We have consequently set up a GOOGLE GROUPS mailing list to keep the membership informed of RSG activities and updates.

On the Reptile and Amphibian front many queries and proposals have been reviewed and addressed which have been sent to the RSG Secretariat. I represented the RSG at the 2007 Kihansi Spray Toad PHVA and 2010 Workshop on Preparation of Guidelines for Re-introduction of Kihansi Spray Toad both held in Tanzania.

A chapter titled "*Guidelines of the International Union for the Conservation of Nature (IUCN) for Re-introduction and their Application to Amphibians*" has been prepared and submitted for Volume 9: Conservation of Amphibians for the series "Amphibian Biology" and which is still in press.

I was also invited to participate in the Amphibian Ark Re-introduction advisory Group. This group will focus on re-introduction issues relating to amphibians.

We have also finalized species or taxon-specific re-introduction guidelines in cooperation with other SSC groups on non-human primates, African elephants, African and Asian Rhinos and Galliformes. Currently we are working on freshwater fish.

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Life on the range -- but where is the range?

We have all seen in recent years dramatic headlines such as “Scientists say Arctic ice is melting fast – can polar bears be released in the Antarctic?”

This grabs public attention and most thinking persons will dismiss the idea - and certainly members of RSG would, with hardly any reference to the RSG Guidelines on the re-introduction of plants and animals. One key tenet of these guidelines is that species should not be released outside their historical ranges.

But, can this principle withstand all pressures in a fast changing world? The IUCN Red List Unit estimates that 35% sampled bird species, 52% amphibians and 71% warm-water, reef-forming corals are potentially susceptible to climate change in their current ranges. Where will their preferred or required conditions be found in future? Where will their geographical ranges be?

This and other major changes in global ecology now force us to reconsider many deeply - entrenched ideas about historic range, viable populations or communities, issues around small and fragmented populations, and declining habitats. Conservation science may have learnt much over the last 20 years about re-introduction theory and practice, ecological restoration, the spread of exotic pathogens, and the behaviours and impacts of invasive species, to which RSG has made a major contribution. But our guidelines are silent on techniques that are appearing increasingly in the conservation discourse and literature, such as ‘assisted migration or colonisation’, ‘managed relocation’ and re-wilding’.

We cannot escape the trajectory of a world in which the existence of large, relatively natural ecosystems, that require little conservation effort beyond ensuring their integrity, will be replaced by pockets of small, intensely managed protected areas in which many species will require individual conservation prescriptions. IUCN also faces questions about its views on moving species around in the face of climate change and other major impacts on species, and it needs a coherent position and policy.

So, conservation faces a major dilemma: does it have the confidence to pre-emptively move species to where someone judges they will be better off under a new climatic regime, or does one say ‘species have gone extinct all the time so each must take its chances as the environment changes around it, whether by adapting or moving’. The two extreme

positions are benevolent intervention or laissez-faire.

The conversation in journals, and indeed in the



public media, about moving plants and animals beyond their current ranges, and the risks and potentials of doing so is growing rapidly. The issue is contentious already - even while there is very little experience of pre-emptive moves of species (but see Willis et al., ‘Assisted colonization in a changing climate: a test-study using two UK butterflies’. *Conservation Letters* 2 (2009) 45-51). Opinions outnumber case histories. But the debate is also leading to theoretical work such as consideration of the potential for moving European plant species (Svenning et al., ‘Big day for moving biodiversity? A macroecological assessment for the scope for assisted colonization as a conservation strategy under global warming’. *IOP Conference Series: Earth and Environmental Sciences*: (2009) 012017; doi 10.1088/1755-1315/8/1/012017).

Against this background, the RSG has been asked by SSC to review and revise the Guidelines to take into account these emerging imperatives for moving species, and also to update or revise IUCN’s 1987 ‘Position Statement on the Translocation of Living Organisms’. The objective is to deliver to the next World Conservation Congress in late 2012 a new product which will have been through IUCN’s internal process of review and approval.

How is this to be done? I am calling an Inception Meeting, essentially of RSG Section Chairs, in May this year to scope our process and tasks. We will also benefit from the participation of the Invasive Species Specialist Group as the risk of relocated species becoming invasive is very real. Following this, we shall enlist the help of experts in species life history traits and community relations, methods for prioritising species for relocation, expert understanding of the accuracy and likelihood of predictions from climate change models, experts in risk analysis, representatives of the IUCN Secretariat and the other Commissions, and so on. We are well aware of the complexities in the task, and the fact that determining a decision process that will be adequately precautionary, yet pragmatic, around permissible moves of species will be very difficult.

We will report regularly to the RSG membership about progress. As an RSG activity, we hope that Section Chairs will be identifying members who are especially keen to help or who can offer specialist expertise. I

will also be delighted to hear from any member with views, suggestions or offers to participate in some way. We see this task as a further way in which RSG can build on the impacts and success of its first Guidelines for Re-introduction, while at the same time enhancing the profiles of SSC and IUCN in practical conservation.

My perception is that our guidelines, published in 1995, have been of enormous practical help around the world, and the volume and quality of re-introductions have improved enormously over the last 20 years - and, after all, this was the main motivation for the formation of the RSG.

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Threatened species re-introduction projects in the Philippines

The Philippines Biodiversity Conservation Program, through the Philippines Biodiversity Conservation Foundation (PBCFI-PBCP) and its local conservation partner agencies on Panay, Negros and Cebu Islands in the 'West Visayas Faunal Region', Central Philippines, are currently involved in developing the first threatened species' re-introduction projects in the Philippines. The latter region constitutes a highly distinct centre of species' endemism, which now supports more seriously threatened endemic taxa than the rest of the Philippines put together. This is a most notable statistic inasmuch as the Philippines also supports more seriously threatened endemic taxa than any other country in the world; thus making the West Visayas arguably the world's single highest conservation priority area in terms of both numbers of seriously threatened endemic taxa represented and degrees of threat.

Following extensive, island/region-wide surveys, several potential sites have been identified (or are scheduled for more detailed assessments) as potential future re-introduction sites for two or more species; the latter currently comprising: Visayan spotted deer (*Rusa alfredi*: IUCN 'Critically Endangered'), Visayan warty pig (*Sus cebifrons*: 'Critically Endangered'), Panay bushy-tailed cloud rat (*Crateromys heaneyi*: 'Endangered') and Visayan tarctic hornbill (*Penelopides p. panini*: 'Vulnerable'); but which may hopefully also include the Visayan writhed hornbill (*Aceros waldeni*) and Visayan bleeding-heart pigeon (*Gallilolumba keayi*) - both IUCN 'Critically Endangered' - at a later date. All of these species have been the subject of long-

standing conservation-breeding programs initiated and developed in three local 'threatened species rescue and breeding centers' on Negros and Panay Islands, likewise established under the auspices of the PBCP; all of which activities also constitute key elements in integrated, longer-term conservation recovery programs for these and other severely threatened West Visayan native habitats and species.

All such potential sites are existing 'vacant' habitats within the known (or presumed) former ranges of these species, and all are legally (if seldom effectively) protected, whether as nationally protected areas, watershed or forest reserves or privately-owned properties. In each case, initial 'conservation needs assessment (CNA) surveys' have been or will be carried out, followed by more detailed biodiversity and mapping surveys and local community and other stakeholder consultations and awareness campaigns; all of the latter activities being undertaken with a view to formulating and implementing consensually agreed conservation management and habitat/species restoration plans. As such, these re-introduction projects are not only intended to meet both existing local governmental requirements and international guidelines, but may hopefully exceed these standards in many cases by placing particular emphasis on the enhanced future protection and management of these areas in close collaboration with all key stakeholders. By these means, it is also intended to include any such individual species' re-introductions as part of an integrated, longer-term conservation management plan for each area; thereby also capitalizing on the interest generated by these projects to assist or enable wider biodiversity conservation objectives in these areas."

William L. R. Oliver, Chair, IUCN/SSC Wild Pigs Specialist Group & Director, Philippines Biodiversity Conservation Foundation Inc. wroliver@gmail.com

Bird re-introduction projects in the United Kingdom

A number of conservation organisations are involved in bird re-introduction projects in the UK. The following is a summary of release programs being carried by the RSPB, in partnership with a variety of other groups.

White-tailed eagle (*Haliaeetus albicilla*)

The white-tailed eagle became extinct in the UK in 1916, due to relentless persecution over many decades. A first phase of re-introduction on the island of Rum in Scotland was followed up by supplementary releases between 1993 and 1998 in Wester Ross. The

first successful breeding took place in 1985, and these re-introductions resulted in a Scottish population of 46 territorial pairs of white-tailed eagles by 2009. A second phase of releases, in eastern Scotland, has seen 45 juveniles released between 2007 and 2009.

At the same time, English Nature announced proposals to establish a third release program in eastern England. Initial progress was encouraging, and a feasibility study, IUCN assessment and site assessment were carried out, but the public consultation process proved tricky and plans have had to be delayed. However, there is still optimism that a release locality can be agreed on and the first birds released by autumn 2010.

Red Kite (*Milvus milvus*)

In the late 1980s, the decision was taken to re-introduce red kites to England and Scotland. Numbers were recovering slowly in Wales, where the remnant population was confined after near extinction early in the 20th century, but there were few signs of range expansion. Accordingly, a re-introduction program was drawn up and, in 1989, juvenile red kites were imported from Spain to a site west of London, and from Sweden to a site in the Highlands of Scotland. By 1992, 93 kites had been released in each locality and successful breeding took place that year. By 2009, seven additional populations had been established, from central England to north east Scotland and in Northern Ireland, using mainly chicks taken from nests in southern England.

The red kite re-introduction project is still running, 20 years after it started, and has been a tremendous success, not only in achieving its original conservation aim but also in terms of public awareness, participation and profile. While the native Welsh population has probably reached in excess of 800 breeding pairs, re-introduced populations have now reached over 700 pairs, most of them in a broad belt across southern England.

Corncrake (*Crex crex*)

The corncrake is a victim of modern farming methods, and became extinct on the British mainland several decades ago. In 2000, a plan was drawn up jointly between English Nature and the RSPB to breed corncrakes in captivity, and release them on a nature reserve in eastern England. Here several hundred hectares of grassland are being managed for birds and other wildlife. From the outset, it was clear that it would be necessary to release relatively large numbers of juveniles, because natural overwinter mortality is high.

The Zoological Society of London was brought in as a

project partner, and in 2001, 15 young captive-bred corncrakes were imported from Germany as founder breeding stock. In the years since, over 600 juvenile corncrakes have been released (all of them bearing numbered rings). In the first few summers, no returning birds were located, but in 2009, at least 23 males were heard in the area. Of six males caught, three were unringed, indicating that they were wild-bred, but three were ringed, showing that the wild population is still probably dependent on further releases.

Cirl Bunting (*Emberiza cirlus*)

The UK cirl bunting reached an all-time low of 118 breeding pairs in 1989, almost confined a small coastal strip in south west England. Although numbers increased thereafter, there were little signs of range expansion by this extremely sedentary species, and re-introduction was considered to be the only means of achieving this.

In 2000, a re-introduction program was drawn up by English Nature and the RSPB, with Paignton Zoo brought in as an avicultural partner. The original plan was to establish a breeding population in captivity, releasing their offspring as juveniles. Unfortunately, no successful breeding in captivity took place, and eventually, with a further increase in the wild population, the plans were revised and a 'rear-and-release' strategy adopted.

The release locality is in south west England, and releases of chicks began here in 2006. The target was to release 60 birds per annum for four years, with a breeding population of 35 pairs expected by 2010. By summer 2009, 188 juveniles had been released and 13 breeding pairs established, with 40 wild-bred juveniles fledging successfully.

Common Crane (*Grus grus*)

The common crane became extinct in Britain around 1600, but a small wild flock became re-established in the late 1970s. A re-introduction project was drawn up in 2006 by the RSPB and the Wildfowl and Wetlands Trust, in partnership with a private wildlife park. The methods to be used follow closely those adopted by the International Crane Foundation for the Whooping Crane in the USA, but one important difference is that the intention is to establish a sedentary rather than migratory population. The wild flock in eastern England is resident year-round, so we are confident that cranes can survive even the severe winter conditions experienced over the past two years.

The first releases are due to take place in autumn 2010 in a 30,000 ha wetland area in south west

England, using juveniles reared in captivity from eggs obtained under licence in eastern Germany. This is expected to be a five year project, with around 20 birds released each year, and first breeding of these birds is expected to be in 2014 or 2015.

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White-winged guan re-introduction in Peru

The white-winged guan (*Penelope albipennis*) is a cracid endemic to the dry forests of the north coast of Peru. Its population is lower than 250 individuals and restricted to a small area of forests of approximately 175 - 190 km long and 5 - 40 km wide in the Peruvian northern dry forests, one of the worlds most threatened ecosystems. It is categorised as critically endangered due to hunting and habitat destruction. It was thought to be extinct until its rediscovery in 1977. Although the species is protected by national laws, other conservation measures have been taken to insure its long term survival, including the creation of protected areas, public awareness campaigns, education in local schools, research and other measures. One of these measures is the creation of a captive breeding program to supply selected birds for re-introduction programs. The breeding centre has been in operation since 1980.

The white-winged guan wild population is fragmented in two sub-populations, being one in the northern part of the specie's distribution and other in the southern part. The distribution area extends over some 1553 km², being 1206 km² (78%) in the northern part and 347 km² (22%) in the southern part. The northern white-winged Guan population is 70% of the total of individuals. The south population is very fragmented, with great areas without white-winged guans, what is an imminent risk of genetic depression in these small isolated populations.

The species was first re-introduced in 2001 in Chaparri Private Conservation Area, in Lambayeque, Peru, and later in 2006 in Laquipampa Wildlife refuge in 2006. Both sites are located in the southern part of the species distribution. Liberation aim was to refresh these isolated populations genetically, as well as to fill the population holes where is needed, especially to the north and the south of Laquipampa Wildlife refuge.

Previous to the release, birds were checked to detect diseases associated to the captive breeding. Selected birds for release were sexually mature at the time of the liberation, for improving the breeding success.



White-winged guan (*Penelope albipennis*)

Since the species is monogamous, the proportion male to females was 1:1. Also, to minimize contact with human populations after the release, parent-raised individuals were released. Birds were kept in semi-captivity prior to the release to enhance survival possibilities.

The first wild chick was born in year 2002. To date, fifty chicks have born in the wild. Also, from year 2006, supplementation was initiated in Laquipampa Wild Refuge, a protected area. To date, six chicks have born and all the adults have survived in the wild.

The future of the species now depends on what are the chances of the offspring to find new territories and colonize them. Monitoring the re-introduced populations and identify of new areas where the re-introduction is feasible is absolutely necessary. Also, an intense education campaign must follow the liberations, since white-winged guans now will increase in numbers and colonize sites outside protected areas, where little or no protections is secured. Hunting remains as the main threat for the species and is done mostly by local hunters, who do not know that the species is critically endangered.

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Re-introduction of Otago skinks, New Zealand

On 28th November 2009, a community group, the Central Otago Ecological Trust (COET) (www.coet.org.nz), re-introduced 12 captive - bred Otago skinks (*Oligosoma ottagense*) into their former range in central Otago, New Zealand. This species is critically endangered due to habitat alteration and predation by introduced mammals. They are extinct from 92% of their former range. Work by the New Zealand Department of Conservation (DOC) has shown that removal of predators alone will recover skink populations.



Otago skink (*Oligosoma otagense*)

Modelling shows that in the presence of predators the species will be extinct in the wild in 10 - 20 years. DOC is protecting the species in the eastern part of their current range. COET are assisting by attempting to re-establish an extinct population in the centre of their former range.

There are abundant Otago skinks in captivity, so COET are undertaking a pilot study to determine whether a wild population can be re-established using captive-bred animals. The Trust has built a 0.3-ha predator-proof fence, eradicated the predators within, removed weeds, planted native shrubs, and introduced 12 Otago skinks. The site is called the Mokomoko Dryland Sanctuary. Because skinks can be recognised by their individual skin patterns, population monitoring is undertaken by photo-resight. Eleven of the 12 skinks have been re-sighted to date and all appear to be in good health. Their survival over the coming winter will be a critical test. Naturally-occurring populations of common skinks (*O. maccanni*) and geckos (*Hoplodactylus maculatus*) are also being monitored inside the fenced area.

If and when this re-introduction succeeds, the Trust plans to extend the protected area and expand the re-introduction program. Therefore, the trust has built a 14 - ha herbivore-proof fence nearby and is currently restoring the habitat within. The vegetation is being monitored by permanent photo points. Volunteers regularly help restore the vegetation at this site.

The Trust has also established a captive breeding facility to generate lizards for re-introductions. This required the development of an innovative method of providing thermal refuge for captive animals during the freezing winters and hot summers. The method involves sealed PVC pipes that angle down from the lizard cages and penetrate 1 m below ground. Here temperatures remain above freezing. This facility is open to the public for viewing.

The Trust has established partnerships with:

- Central Stories Museum (three live Otago skinks, donated by COET, are on display to the public; Museum now uses skinks as their own flagship

species for promotion. For example, they advertise public feeding times for the skinks, they sell Otago skink T shirts, they distribute information brochures, and their skinks are often in the media. A model skink is now displayed on the entrance sign to the museum on the main street. This display continues to be one of the main drawcards for the museum.

- Otago Polytechnic (student volunteers and donation of native plants).
- Kiwi & Birdlife Park (expertise and donation of native geckos for breeding).
- Department of Conservation (COET are members of the Grand and Otago captive skink breeding program).
- Landcare Research (in kind support through provision of office and telephone).

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India's Captive Elephants: a twisted tale

November, 2009: an order came down from the Indian Ministry of Environment & Forests that elephants were banned from zoos and to be moved to forest elephant camps, forthwith. The order was a surprise; few knew of the pressure from animal welfare on MOEF for disengaging elephants from zoos. This aspiration goes back years with a similarly surprising *dictat* discontinuing circus animal performances. Circus income fell and owners could not maintain the animals so all 300+ lions and tigers sat in filth, starving in tiny travelling cages until it was arranged for Indian zoos to inherit these hybridized, diseased, and traumatized animals. Even then, captive elephant issues loomed but could not be implemented.

What forced government to suddenly order all zoo elephants to elephant camps is unspecified, but the plight of 3,000+ captive elephants had been discussed at Ministerial meetings for years. In present context take note that of all six categories of captive Indian elephants 1) privately owned, 2) temple, 3) begging, 4) circus, 5) zoo and 6) camp elephants, the zoo elephants ranked **2nd least mistreated** in their situation, first being forest camp elephants. This is documented by Dr. Surendra Verma who assessed and ranked the groups on systematic parameters.

One may wonder why the government did *not* go for privately owned/work elephants or temple/begging elephants also, or lieu of, zoo elephants. This is not rocket science: elephant owners would arrange

lawsuits and protests, freezing the issue for decades. Also, the possibility of government “winning” legal battles is fraught ... what to do with 3,000+ confiscated elephants? If ever there was an elephantine problem, this is it. So the government went for what governments could do, thus targeting its own elephants - zoo elephants. The decision brought about many valid complaints, even from forest officials who pointed out that not *all* elephant-holding zoos are doing a bad job of it, that many forest elephant camps already have more elephants than required, and that some of the camps themselves are not “elephant heaven”.

Other issues of moving animals, such as principles of the Re-introduction Specialist Group took a back seat to welfare and institutional issues, such as animal health, general condition, infectious diseases (tuberculosis), etc. It is disturbing to think of poorly maintained, unfit zoo elephants travelling far distances. Diseased elephants joining camp elephants, many of which are released into the forest at night to graze and breed wild elephants is a nightmare. Or, transporting elephants badly without strict protocols has proven disastrous, as documented in media reports even in connection with high level government events. Any of these belies principles of “good practice” in wildlife management.

What now? On one hand we have a few dozen elephants in some of the *least unsuitable situations* (zoos) banned and going to camps, which may or may not be an improvement. On the other hand we have thousands of privately owned work, temple and begging elephants far worse off, because their problem is too hard to solve. What to do? It is known that in one Ministerial meeting a couple of years ago, attendees including government officials were very interested to tackle privately owned elephants and temple elephants...but the specter of inevitable lawsuits, delays, “hue and cry” and worse from political groups exploiting the issue gave them pause. If government is ready to take on this very worthy issue, it could be done, peacefully and effectively with national legislation, as has been done in the case of 450+ zoos, the Zoo Act and the Central Zoo Authority. It would be exponentially better if the recent zoo ban could be seen as part of a process to solve the problem of *all* captive elephants being poorly kept.

A body such as the Asian Elephant Task Force in the Ministry could sponsor national legislation requiring that *all* elephant owners in the country - even the elephant camps - follow standards of best practice. Such legislation can be added to the Wildlife Protection Act as an Amendment, and passed relatively quickly. There are abundant scientific reports published in India for reference in creating



Asian elephant in Mysore, India

standards, as well as a wealth of research and standards from different countries holding captive elephants.

There is the necessity of inspection and monitoring, but the states with help from the Animal Welfare Board of India and even animal welfare groups could assist. This method also would take time, just as the zoo issue took time, but the zoo act *is* working. Indian zoos are improving and worse case zoos closed. If this scenario could be implemented, that unreasonable order might be justified as a catalyst toward liberating all captive elephants from a tormented existence. They would not be free, but they could be free of pain and discomfort when carefully crafted legal standards are implemented and upheld.

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Update of Australian Wildlife Conservancy Re-introductions

Scotia Sanctuary is a 64,653 ha conservation reserve situated in far western New South Wales, Australia that is privately-owned and managed by the Australian Wildlife Conservancy (AWC; www.australianwildlife.org). AWC is a non-profit organisation whose mission is the effective conservation of Australia’s fauna and its habitats. To this end, AWC owns and manages 21 sanctuaries throughout Australia covering 2,521,587 ha and conserves 65% of Australia’s native mammals, 83% of its native birds, 47% of its native reptiles and 48% of its native amphibians. In total, AWC conserves 45% of Australia’s listed threatened species.

Numbats

The Scotia Endangered Species Recovery Program has involved re-introducing seven species that were previously considered extinct in NSW. One of those,



A captured numbat

the numbat (*Myrmecobius fasciatus*), was re-introduced to Scotia's 4,000 ha Stage 1 in 1991 and numbers are thought to be stable between 50 and 100 individuals. Consequently, a re-introduction was conducted to Stage 2 in December 2009.

Numbats are captured following detection from early morning or late afternoon driven transects when they are herded into refuge hollow logs on the ground and then extricated. Almost 1,000 kms of track were surveyed for 38 detections and seven captures of dispersing juvenile males. These were fitted with radio collars (Sirtrack) and monitored for the three month battery life of the collars. Six of the seven numbats survived this period with the solitary mortality event attributed to predation by a sand goanna (*Varanus gouldii*).

Current, monitoring methods for numbats are insufficient to derive reliable population estimates, so number of detections per 100 km of driven transect is the existing method of monitoring populations. Such indices are difficult to base management decisions on, so research is underway to determine more accurate methods of population estimation. Scotia also has fewer hollow logs on the ground than other sites, which makes capturing numbats more difficult. Trials are planned to see if artificial logs can supplement the existing number of refuge sites for numbats and whether they can be used as capture locations. Finally, a supplementation is planned for late 2010 to input females into the Stage 2 population.

Woylies

Fifty-seven (57) woylies (*Bettongia penicillata*) were re-introduced to Stage 2 of Scotia from AWC's Karakamia Sanctuary (Western Australia) in October 2008. The Stage 2 population initially declined to 37 individuals in December 2008, but has since increased and was estimated to be 81 (78 - 94) individuals in December 2009. A full report of this reintroduction is in the 2010 IUCN Reintroduction Specialist Group Case Study Book (*in press*).

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Creation of viable breeding satellite population of great Indian one-horned rhino in Bhadhi-Churella Taal sector of Dudhwa National Park, India

The Great Indian one-horned rhinoceros (*Rhinoceros unicornis*) was once widely distributed from Hindukush Mountain Range (Pakistan) to Myanmar and also all along the flood plains of Ganges River. In the last 200 years over-hunting, fragmentation of habitat by clearing forest for cultivation, desperate land use for agriculture, extension of tea gardens, reclamation of grasslands and swamps are the major causes of elimination of Indian rhinos from most of its former range of distribution. At present the Indian rhinos population is restricted to protected areas in Assam, West Bengal and Nepal. By considering the highly restricted distribution with poaching pressure, habitat specificity and considering the scattered small population, it becomes imperative to re-introduce the species in suitable habitats in its former range of distribution.

Of the various areas considered by the sub-committee, Dudhwa National Park was thought to be the most promising because similarities of the habitat to that of Kaziranga National Park, the fact that the rhinos have been recorded in this area till the last century and the adequacy of the protection available.

The re-introduction of rhino in Dudhwa took place in two phases. The first phase in 1984, in which five rhinos (2:3) were captured, and translocated to Dudhwa from Pobitora WLS, Assam. Of these five animals, one female died of stressful abortion before she could be released. The first batch of animals was released in Dudhwa on 20th April 1984. The male was held back until the others had settled and released after radio-collaring a few days later. Another female died on 31st July 1984 after a bid to tranquilize her to treat a wound. With only one female and two males left, an urgent need was felt to translocate some more rhinos. The four female rhinos captured from near Royal Chitwan National Park arrived in Dudhwa in April 1985. Thus these seven rhinos (2:5) made up the seed population of rhinos. All the rhinos are kept in an area of 25 km² encircled by a power fence.

The first evidence of breeding in the re-introduced population was detected under unfortunate circumstances when remains of a newly born calf were discovered in a patch of tall grass in August 1987. The first successful calving occurred in 1989. Four more calves followed this in the same year. Unfortunately, in 1991, out of five female rhino one adult female died of a stressful abortion and later her calf was also killed in 1992. Breeding success followed then and the seed population of five has since



Indian one-horned rhino

increased to 28 which also includes (1:4) of the founders. In the current rhino population there are total 10 adult females in an age group of 8 - 29 years and among adult males total number is five males in an age group of six to 32 years. Rest of the 17 calves' fall in an age group of a couple of months to 5 years.

Area selection for creating the satellite population

The main reason to create another satellite rhino population was to check inbreeding, fighting between males, males along with females stray outside by breaking the electric fence and over population of rhinos in comparison to the total area and habitat available. To avoid all these issues it was proposed to have satellite rhino populations in Bahdital-Churella sector in Dudhwa NP/TR. A feasibility study with regard to the habitat availability for the re-introduction of rhino in Dudhwa was carried out by the Botanical Survey of India (Hajra, 1980), and Sinha and Sawarkar (1991), Sinha *et al.*, (2003).

A detailed vegetation study in the proposed rhino area in Bhadhi - Churella Sector was carried out by Sinha *et al.*, 2003. In 2002 - 2003 the erection of power fence and poles was started around Bhadhi Taal - Churella sector but due to some reasons could not be completed. The area to be power fenced in the Bhadhi Taal - Churella Taal sector was on the basis of number of animals in the population to be translocated. Currently the area supports migratory herd of elephant, swamp deer, sambar, spotted deer, hog deer, barking deer, otters and large number of migratory and resident birds along with tigers. The advantage of the area selected is that it is in the central location of Belraya Range. Bhadhi-Churella sector is centrally located and sufficient forested area is available in northern part and demarcated by Mohana River as the international boundary with Nepal.

The habitat requirement of Rhinos, the Bhadhi - Churella Taal sector fulfills the basic need like

adequate forage availability, wallowing, shade of woodland for resting and calving and for free movement. The area comprises of Sal and Mixed forests (2,416.36 ha), Grassland (1,203.68 ha) and Wetland/ Swamp (129.00 ha), which fulfill the needs of the rhino, and is one of the prime rhino area in Dudhwa.NP.

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Reviewing plant re-introductions: learning more about the knowledge gaps than re-introductions themselves?

Re-introductions are considered by some practitioners to be a controversial management option for mitigating threatened vascular plant declines. The use of seed and whole plant propagules to create populations within the historic range of the species has been criticised for the lack of monitoring and central recording, inappropriateness due to genetic considerations, and inadequate knowledge of donor population demography and species' habitat requirements. Despite these criticisms, plant reintroductions and conservation introductions are growing in use by practitioners that see no other option for meeting management targets. In its most interventionist form, re-introductions overlap with controversial approaches such as assisted colonisation which have potential for preventing climate-driven extinctions. We undertook a major review of threatened plant reintroductions which aimed to comprehensively describe the past and current use of the technique and enable a meta-analysis of the success of attempted reintroductions.

Using systematic review methodology we identified peer-reviewed and grey literature that provided evidence for attempted or planned re-introductions (using various definitions which some practitioners might describe as conservation introductions) of approximately 700 taxa in 32 countries. Threats to target taxa were recorded and agriculture, grazing, competition from invasive or aggressive plants and urban or industrial development were the most often cited accounting for 60% of stated causes of decline. Approximately one third could be classed as narrow endemics but another third had, at least formerly, wide distributions. This, together with the high proportion of taxa qualifying for national protection, indicates that many re-introductions are undertaken because the taxon is declining in part of its range, rather than a 'last resort' to mitigate species-level

extinctions.

Further meta-analysis of 301 attempted re-introductions of 128 plant taxa, generated relative measures of re-introduction success based on propagule survival, population persistence and recruitment of progeny. We conclude that attempting to summarise re-introduction success based on the results reported in the literature may erroneously imply that re-introductions are mostly successful. This is due to early reporting of outcomes in the literature: the average monitoring time prior to publishing the outcome of a study is about 3 years. - Even for annual species this time period is insufficient to judge whether a re-introduction has been successful. Our treatment of the data to discern population persistence (extant or extinct at specified time points) is a coarse measure, but illuminating: for those projects that were monitored for > 10 years, most re-introduction attempts failed. Further, the vast majority of projects which were initiated >5 years prior to this review, are unknown in outcome, indicating that a significant pool of data may exist and could be used to better evaluate re-introductions if it were publicly available.

We used covariates associated with the target organism and intervention to discern patterns in re-introduction success based on the proportion of surviving propagules. Many factors that might be expected to confer lower risk to a project could not be linked to increased success of threatened plant re-introductions with the currently available evidence. These factors included removing the cause of original species decline from a site prior to propagule introduction, ensuring the site is within the historic range of the species and sourcing propagules from wild, rather than *ex situ*, populations. It should be emphasised that we are not suggesting that these parameters are inconsequential considerations in re-introduction programs - these findings do not provide evidence of no effect on re-introduction success. However, it does imply that we have not correctly identified key variables that can explain differences in success and further careful investigation is needed to do so.

In undertaking this review and meta-analysis we realised that a number of key aspects of re-introduction practice were extremely difficult to define and incorporate into the evaluation of this technique. Knowledge gaps were particularly evident in areas such as identifying key causes of decline; practitioners often described the historic threats to the species e.g. 'agricultural intensification' or 'habitat loss', but had not elucidated the precise mechanism causing decline. Additionally, it was not evident that areas of population growth and decline had been identified in extant, wild populations. We

suspect that some re-introductions fail because restored populations are being created in conditions which emulate wild populations that are in decline (albeit, a decline which is difficult to discern). However, we have no empirical evidence to support this hypothesis and further research in this area is recommended. Intervention-related management such as watering or weeding of propagules, was so variable that it proved impossible to incorporate into the analysis in a meaningful way. The failure to account for the effects of management on the success of a re-introduction project is acknowledged to be a weakness in our review.

A qualitative synthesis of speculated causes for failure in combination with the absence of empirical evidence to show that the factors mentioned above can enhance success, are taken together to support calls for amended guidelines for future re-introduction projects. Further monitoring and improved dissemination of the outcome of existing projects is needed. Plus, more rigorous design of projects using replication of treatments and sites in addition to improved monitoring of individuals and populations is required to conclusively elucidate the causes of failure in this increasingly utilised restoration technique. Overall, we hope that this review can be used to inform future investigations and implementation of more effective re-introduction plans.

The full review report (Review 32: are (re-) introductions an effective way of mitigating against plant extinctions?) can be accessed through the Collaboration for Environmental Evidence website. www.environmentalevidence.org/SR32.html

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