The Scottish Code for Conservation Translocations

Best Practice Guidelines for Conservation Translocations in Scotland

NSRF
National Species Reintroduction Forum

Foreword by Paul Wheelhouse MSP

Bringing back species formerly thriving in our country and restoring others to places where they once occurred naturally are two of the most important means of helping nature. Increasingly, translocations are a key tool for replenishing species lost or about to be lost through habitat fragmentation, persecution, excessive exploitation and climate change. The National Species Reintroduction Forum (NSRF) was formed in 2009 to guide work needed to inform such ambitions. Chaired by Scottish Natural Heritage (SNH), and eventually with 27 member organisations, the Forum had the uniquely difficult but rewarding job of producing guidance on best practices.

This work is truly challenging, for we need to weigh up the opportunities and gains, as well as the risks to existing wildlife, livelihoods and the welfare of people. This risk based approach was first enshrined in the *IUCN Guidelines for Reintroductions* published in 1998. These provided a globally recognised steer on how countries should go about reintroducing species and moving them from one area to another.

Through the Species Action Framework (2007-12), led by SNH and involving dozens of partners, we have seen remarkable progress in the restoration of populations through translocations of plants such as woolly willow, and a range of animals, notably the pine hoverfly, freshwater pearl mussel and vendace, Britain's rarest fish species. The experimental trial evaluating the feasibility of reintroducing beavers to Scotland is significant in the depth and diversity of work carried out.

Last year the IUCN published *Guidelines for Reintroductions and Other Conservation Translocations*, providing much more detail on assessments, consultations and methods to be adopted. In Scotland, we have taken the next big step, and built on this foundation to develop a clearly articulated national Code, and Guidelines on best practice. This is, we believe, a world 'first'. Combining the experience, expertise and aspirations of many partners, we have drawn on the biological and social sciences, and in particular on socio-economic and cultural values.

Having recently published the *2020 Challenge for Scotland's Biodiversity*, refreshing Scotland's Biodiversity Strategy, I am delighted to see progress already on reintroductions and translocations. By following the steps outlined in our new guidance, organisations should avoid the conflicts and pitfalls that can bedevil good intentions. By getting the processes right we can achieve so much more for people and nature. Great opportunities lie ahead for rejuvenating nature. We have the prospect not of small steps, but instead giant leaps for nature. But we will realise this only if the preparations for each translocation are themselves well planned. I congratulate the NSRF for so adeptly drafting both the Scottish Code and Best Practice Guidelines.

Paul Wheelhouse MSP
Minister for Environment and Climate Change

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Summary

Conservation translocations involve the deliberate movement and release of plants, animals or fungi into the wild for conservation purposes.

Conservation translocations, such as reintroductions, can provide a conservation benefit by increasing the number of individuals or places in which a species occurs. They can also offset biodiversity declines caused by habitat loss, climate change, or other human impacts on the environment.

Many conservation translocations are low-risk. However, some have the potential for negative impacts on the environment and other land-uses.

The Scottish Code for Conservation Translocations and *Best Practice Guidelines for Conservation Translocations in Scotland* give guidance on when conservation translocations may be appropriate and the types of situation in which they may cause problems to wildlife, people, and the environment.

'The Code at a Glance'

- **Work out whether translocation is the best option: could other conservation actions provide a lower-risk and lower-cost solution?**
- **Where translocation is the best option, develop a clear plan to deliver a well-defined conservation benefit**
- **Obtain all necessary permissions and licences**
- **Maximise the chances of success by understanding the biological needs of the species**
- **Take great care to protect the species being moved, the habitat it is being released into, and avoid the spread of invasive species, pests and diseases**
- **Where translocations may affect people, consult with land-users and other interested groups and individuals to identify ways the translocation can provide them with benefits, and do not undertake translocations that would cause unacceptable harm to people's wellbeing, livelihoods and recreational activities**
- **Monitor the translocation and respond to any issues that arise**
- **Keep people informed and share information about the translocation to guide future projects**

Oblong woodsia

Preface

Scotland's land and countryside provides many benefits to people and wildlife. Scotland is home to iconic species such as the Scots pine and the Scottish wildcat and internationally important habitats such as peatlands, the machair and the Atlantic hazelwoods. Scotland's countryside also supports a world renowned game and fishing industry, an internationally important forest industry, provides a spectacular destination for tourists, and is the source of high-quality food, clean water and other resources which benefit the public in Scotland and beyond. Rural Scotland is also home to almost one million people.

Management of Scotland's land to support these different land-uses involves a balancing act. The National Species Reintroduction Forum (**NSRF**) was established by Scottish Natural Heritage to guide strategic thinking on this balance for conservation translocations. The NSRF consists of representatives of conservation organisations, government departments, landowners and estates, and the farming, forestry, fishing, and game management sectors.

Many conservation translocations are uncontentious. For example, the well-executed reintroduction of an endangered fern on the scree slopes of a Scottish mountain to replenish populations devastated by Victorian fern collectors is unlikely to cause problems for other users of the land. In contrast, translocations involving top-level predators, or species which have significant environmental impacts, create greater potential for conflicts between different land users.

The Scottish Code for Conservation Translocations and its associated *Best Practice Guidelines for Conservation Translocations in Scotland* have been produced to guide conservation translocations in Scotland and to minimise conflicts. For 'low risk' translocations, they serve as a checklist of issues to consider, and provide a mechanism for translocations to proceed in a careful and thorough fashion, without the need for excessive bureaucracy and paperwork. Where the translocation has legal constraints, or the potential for negative impacts on people, biodiversity or the wider environment, the code and guidelines outline the process for planning, consultation, and evaluation of benefits and risks to inform the decision of whether (and how) to proceed.

A summary and full version of *The Scottish Code for Conservation Translocations*, and the *Best Practice Guidelines for Conservation Translocations in Scotland*, are available from a dedicated **website** and will be regularly reviewed to ensure that the advice remains current.

The Scottish Code for Conservation Translocations

Background

Conservation Translocation refers to the deliberate movement and release of living organisms for conservation purposes. This includes:

- *Reinforcement* - adding to an existing population
- *Reintroduction* - restoring a species to parts of its natural range from which it has been lost
- *Conservation Introduction* - establishing new populations of a species outwith its natural range

Translocations represent just one type of conservation action. In most circumstances, management of species in their current localities, and wider habitat management, will be more cost-effective and lower risk. However, there are some situations where conservation translocations are appropriate. This Code and its accompanying *Best Practice Guidelines for Conservation Translocations in Scotland* provide a framework for evaluating whether and how to undertake such conservation translocations in Scotland.

When might conservation translocations be appropriate?

Human induced habitat loss and degradation, and other factors, have caused population size reductions and local extinction in many species. In addition, climate change is leading to environmental conditions becoming unsuitable for many populations in their current locations. Given that natural barriers and habitat fragmentation limit the ability of some species to respond to such threats by natural re-colonisation or migration to new localities, conservation translocations can serve to offset these losses.

What are the potential benefits from conservation translocations?

Reducing extinction risk and/or improving the conservation status of a species by:

- Increasing the number of individuals, and/or increasing the number of locations at which a species occurs
- Improving the genetic health and resilience of a population by directly introducing genetic diversity
- Establishing 'bridging populations', to facilitate migration and/or genetic exchange
- Establishing populations in areas where the species will experience reduced levels of threat (e.g. by moving organisms into more suitable 'climate space', disease-free areas, or localities with suitable management).

Improving the conservation status of an ecosystem, habitat and/or other species by:

- Increasing the overall species richness of a habitat to enhance its biodiversity value
- Increasing habitat quality (e.g. translocating species to change grazing regimes)
- Improving ecosystem services and functions (e.g. translocating species to provide pollinator services)

Additional socio-economic benefits that may arise as a result of conservation translocations:

- Enriched human experiences and environmental awareness due to increased contact with biodiversity
- Improved ecosystem services which lead to human benefits (e.g. pollination of food plants)
- Revenue from ecotourism where the translocated species leads to increased visits or spend

What are the potential risks from conservation translocations?

Negative outcomes that may arise from conservation translocations include:

- Direct harm to the conservation status of the focal species, or welfare of individual animals, due to removing individuals at the donor site, or mortality in transit or after release
- Harm caused to other species or habitats by the translocated population (e.g. due to competition, disease transmission or genetic swamping)
- Harm to humans if translocated populations cause health problems, or negative impacts on livelihoods or leisure

The Scottish Code for Conservation Translocations **is not an advocacy document for translocations.**

Its aim is to guide the process of evaluating whether a translocation is appropriate, and if so, how to increase the likelihood of successful outcomes, and reduce the likelihood of problems and conflict.

It is based on the principles of precaution and proportionality.

The level of planning and evaluation should be proportionate to the level of risk.

Where there is considerable uncertainty in the level of risk, translocations should not proceed. Where there is a risk that unacceptable damage may occur, translocations should not proceed.

The code is designed to cover translocations where conservation is the primary purpose. It does not cover translocations where the primary purpose is agriculture, aquaculture, hunting, forestry or horticulture, or releases made on other grounds such as individual animal welfare.

The Scottish Code for Conservation Translocations

The Code

Evaluate whether a conservation translocation is the best option

- Undertake an assessment of whether other management actions may be more appropriate (or complementary) in providing a lower-risk, lower-cost, less interventionist conservation solution

Where translocation is the best option, develop a plan to deliver a defined conservation benefit

- Establish the desired outcome: this should be to improve the conservation status of the focal species/habitat by enabling more individuals/populations to survive in the wild; and also to provide wider benefits to biodiversity and people
- Develop a plan including goals and actions, assessment of feasibility and desirability, risk and resource needs, monitoring and management actions (including integration with other conservation actions), and an exit strategy; the depth of planning should be proportionate to the level of risk

Stay legal: obtain necessary permissions and adhere to relevant legislation

- Obtain permissions from landowners before collecting or releasing organisms in the wild
- Consult with Scottish Natural Heritage before undertaking translocations which involve protected species or designated sites, or moving species outwith their native range; obtain all necessary legal permissions and licences
- Where the translocation involves moving organisms to/from other countries, obtain all necessary import/export permissions and licences, and consult with the relevant statutory bodies in all involved countries to establish national legislative requirements
- Adhere to any relevant animal welfare, health and safety, biosecurity, quarantine and sanitation legislation

Maximise chances of successful establishment of the translocated population

- All translocations must be grounded in a thorough knowledge of the species' ecological requirements
- Avoid selecting donor populations that have reduced genetic diversity or are likely to be poorly adapted to the release site
- Ensure that the release site and wider area meets all necessary requirements for survival and maintenance of healthy populations into the foreseeable future
- Select the timing, life stage and numbers/sexes of individuals to be released based on the reproductive ecology of the focal species and likely seasonal changes in survival/establishment
- Deliver ongoing management to help translocated individuals survive and become established

Minimise the risks of harm to biodiversity

- Do not remove organisms from a donor site if it will place that population at risk
- Adopt high standards of animal welfare, and adopt strategies to avoid stress, harm or mortality during the translocation and subsequent release and monitoring
- Adopt appropriate animal and plant health quarantine and sanitation procedures to avoid the spread of harmful pests and diseases
- Evaluate whether establishment at the release site is likely to lead to unacceptable, negative effects on species, habitats or the wider ecosystem, and do not proceed if this is likely to occur
- Evaluate the likelihood of the species or its genes becoming problematically invasive following the translocation, and do not proceed if this is likely to occur
- Avoid mixing highly divergent populations that are likely to be genetically incompatible

- Take particular care where translocations involve islands or isolated water bodies to avoid disrupting their natural isolation from invasive species, pests and diseases
- Translocation of species into areas where they have not previously occurred naturally should only be undertaken if the desired conservation outcome cannot be achieved by other means

Maximise societal benefits and minimise conflict with other land-users

- Consult with other land-users and stakeholders to fully understand the potential socioeconomic consequences of conservation translocations as part of the process of deciding whether it is acceptable to proceed, noting that the benefits and costs of a conservation translocation may be unequally distributed among different stakeholders/ land-users
- Evaluate the potential for a translocation to lead to economic or cultural benefits, and identify how any benefits can be targeted
- Evaluate the potential for a translocation to cause harm to human health, well-being and livelihoods and only proceed if acceptable mitigation and management mechanisms can be identified and delivered appropriately
- Have resources in place, and clarity on financial liabilities and legislative restrictions, to deliver any necessary ongoing management and, in exceptional circumstances, to enable reversal of a translocation should unforeseen and unacceptable consequences arise

Record translocations and monitor, evaluate and communicate outcomes

- Monitor translocations to evaluate success and to inform any necessary ongoing management interventions
- Document the translocation and share findings to inform future strategies and projects

Where to get more information and help

The accompanying *Best Practice Guidelines for Conservation Translocations in Scotland* provides further detail on the issues to consider and the practicalities of implementation. Scottish Natural Heritage is the government agency for nature conservation in Scotland, and its staff are available to offer guidance on best practice and regulatory requirements.

The Scottish Code and Best Practice Guidelines are based on the International Union for the Conservation of Nature's 2013 *Guidelines for Reintroductions and Other Conservation Translocations*.

National Species Reintroduction Forum

Best Practice Guidelines for Conservation Translocations in Scotland

Introduction

Chapter 1: Introduction

Background information

In 2013 the Species Survival Commission Reintroduction Specialist Group and the Invasive Species Specialist Group of the International Union for the Conservation of Nature (IUCN) produced **new guidelines** for the intentional movement of living organisms for conservation purposes. The motivation for producing these new guidelines was the increasing scale and frequency of conservation translocations in light of increasing threats to biodiversity from climate change, habitat degradation, fragmentation and destruction.

The new IUCN guidelines represent the international standard. They were used as the basis for the Council of Europe's recommendation on 'Conservation Translocations under Changing Climatic Conditions', which is now a formal policy for the 50 signatory governments to the Bern Convention on the Conservation of European Wildlife and Natural Habitats.

The Scottish Code for Conservation Translocations and the associated *Best Practice Guidelines for Conservation Translocations in Scotland* have been produced by the National Species Reintroduction Forum (**NSRF**), through a partnership project led by Scottish Natural Heritage (SNH) and the Royal Botanic Garden Edinburgh (RBGE), to provide advice on the interpretation and implementation of the IUCN translocation guidelines in Scotland. The NSRF represents a diverse set of stakeholders including governmental and non-governmental bodies, and from across the conservation, land use and scientific sectors. Together, the Scottish Code and Best Practice Guidelines should enable individuals to undertake a thorough and transparent feasibility evaluation, and balance the risks and costs of intervening with the risks and costs of inaction. They are designed to be read alongside the IUCN guidelines.

The Scottish Code and the Best Practice Guidelines are non-statutory in nature, but many aspects of conservation translocations are covered by formal legislation, and are subject to licensing requirements from Scottish Natural Heritage and other statutory bodies.

The scope of the Scottish Code and the Best Practice Guidelines includes the translocation of organisms for conservation purposes in terrestrial and marine environments in Scotland. It does not cover translocations where the primary purpose is agriculture, aquaculture, hunting, forestry or horticulture, or releases made on other grounds such as individual animal welfare.

Types of translocation

The definitions used here are based on the IUCN's 2013 ***Guidelines for Reintroductions and Other Conservation Translocations***.

Translocation is the human movement of living organisms from one area, with release in another, and may involve transfer of organisms from the wild or from captivity.

Conservation Translocations are the intentional movement and release of a living organism where the primary goal is a conservation benefit.

This usually involves improving the conservation status of the focal species, and/or restoring natural habitat or ecosystem functions or processes.

Introduction

Conservation translocations can entail releases either within or outwith the species' natural (indigenous) range (Fig 1), and can be subdivided into the following categories.

Population Restoration is a conservation translocation within the natural range, and includes:

(a) Reinforcement - translocation of an organism into an existing population of the same species. Reinforcement aims to enhance population viability, for instance by increasing population size, by increasing genetic diversity, or by increasing the representation of specific demographic groups or stages.

[Also known as: Augmentation; Supplementation; Re-stocking; Enhancement]

(b) Reintroduction - translocation of an organism inside its natural range from where it has disappeared, to re-establish a viable population of the focal species.

Conservation Introduction is a conservation translocation outwith the natural range, and includes:

(a) Assisted Colonisation - translocation of an organism outwith its natural range where the primary purpose is to benefit the focal species. This is typically aimed at establishing populations in locations where the current or future conditions are likely to be more suitable than those within the natural range, but which the species is unlikely to be able to move to via natural dispersal. The scale of assisted colonisation can range from local movement beyond the margins of the existing distribution to wide-scale international range shifts.

[Also known as: Benign Introduction; Assisted Migration; Managed Relocation]

(b) Ecological Replacement - translocation of an organism outwith its natural range where the primary purpose is to perform a specific ecological function that has been lost through extinction. Ecological replacement usually involves replacing the extinct taxon with a related sub-species or species that will perform the same or similar ecological function.

[Also known as: Taxon Substitution; Ecological Substitutes/Proxies/Surrogates; Subspecific Substitution, Analogue Species]

In all cases, conservation translocations have the primary goal of achieving a conservation benefit, which is defined as an improvement in the status of the focal species, habitat or ecosystem. Translocations that benefit only the translocated individuals (e.g. for welfare reasons) are not within the scope of the Code.

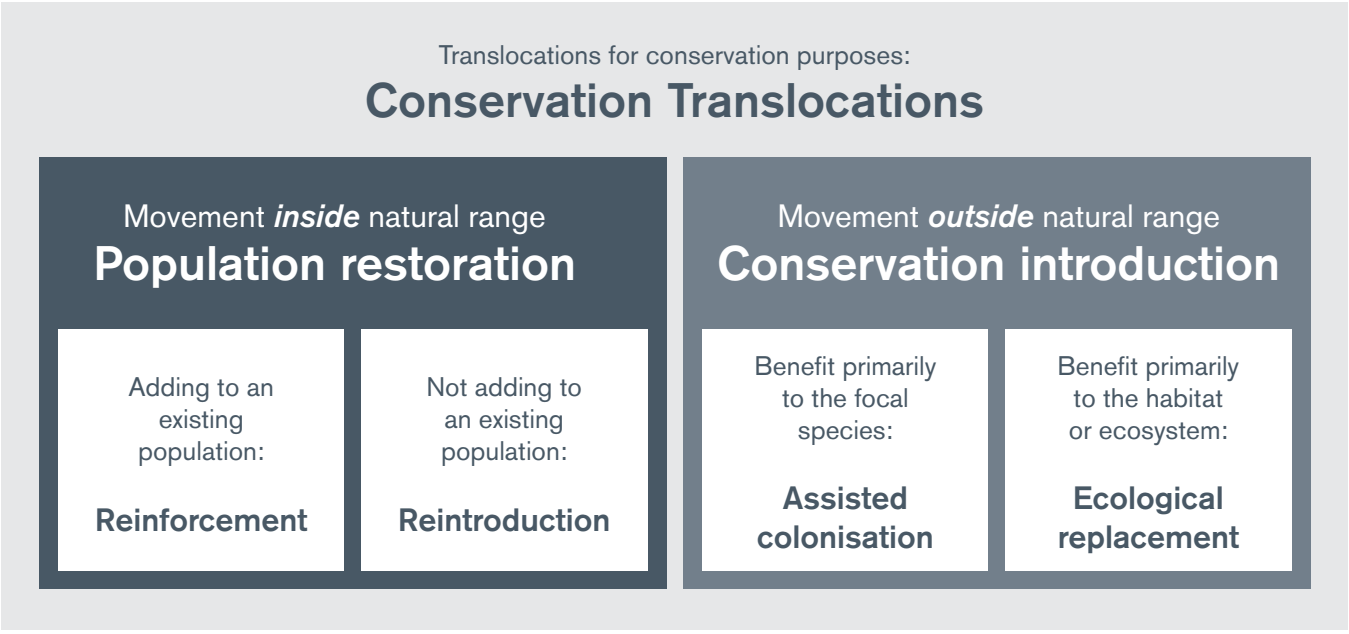


Figure 1.
Overview of the types of conservation translocations

Pine hoverfly

Introduction

Key terms

- *Focal species* is the species being translocated
- *Organism* refers to individuals or their propagules such as seed, eggs, spores, sperm or pollen
- *Release* is the placement of living organisms in the wild
- *Donor site/location/population* is the place where translocated organisms are taken from
- *Recipient site/location/population* is the place where translocated organisms are released
- *Natural range* refers to the part of the natural past or present distribution of a species or other taxonomic entity (e.g. the places it has reached without movement by humans); natural range includes all locations where a species is indigenous.
- *Native range* refers to the part of the natural range where a species or other taxonomic entity *currently* naturally occurs (e.g. the places it has reached without movement by humans *and* still occurs at). It is a term used in Scottish legislation in which it is defined as "the locality to which the animal or plant of that type is indigenous, and does not refer to any locality to which that type of animal or plant has been imported (whether intentionally or otherwise) by any person". [For the purpose of this legislation fungi are considered as plants].

A detailed glossary is provided in **Appendix 3**.

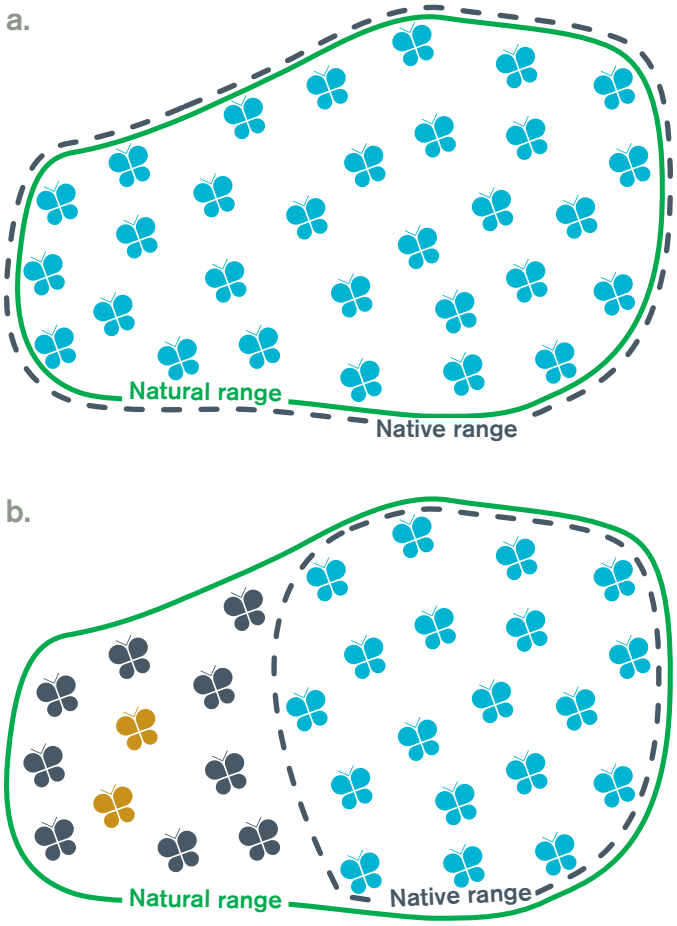
Planting woolly willow on hill sides

Understanding the differences between ‘natural range’ and ‘native range’

Native range has a specific legal meaning in the context of translocations within Scotland.

Native range is similar to natural range, but with one important difference: once a type of animal, plant or fungus becomes extinct in a locality, and it is unable to recolonise naturally, that locality is legally considered to be outwith its native range. If there is a subsequent reintroduction, the reintroduced population is considered as ‘non-native’ (e.g. outwith the native range) despite being within the ‘natural’ range (Fig 2).

Chapter 5 provides details of licensing requirements for translocations outside of the native range.



Current naturally occuring population. These populations occur in the natural and native ranges. The natural and native range may be the same as in (a) or the native range may only be a part of the natural range as shown in (b).

Natural population that is now extinct. These populations form part of the natural range but not the native range.

Population reintroduced into natural range (but legally considered non-native and outside of current native range).

Figure 2.
The distinction between natural and native range

Overview of translocation planning

Chapter 2: Planning a conservation translocation in Scotland

The key stages in planning and undertaking a conservation translocation are summarised in Fig 3. They include:

(a) An initial appraisal of whether a translocation is the best course of action and is likely to be feasible

(b) Developing detailed plans culminating in a decision by the proposer whether they wish to translocate or not

(c) Obtaining permits and (if granted) undertaking the translocation, and

(d) Monitoring the outcome, delivering any necessary ongoing management and communicating the findings

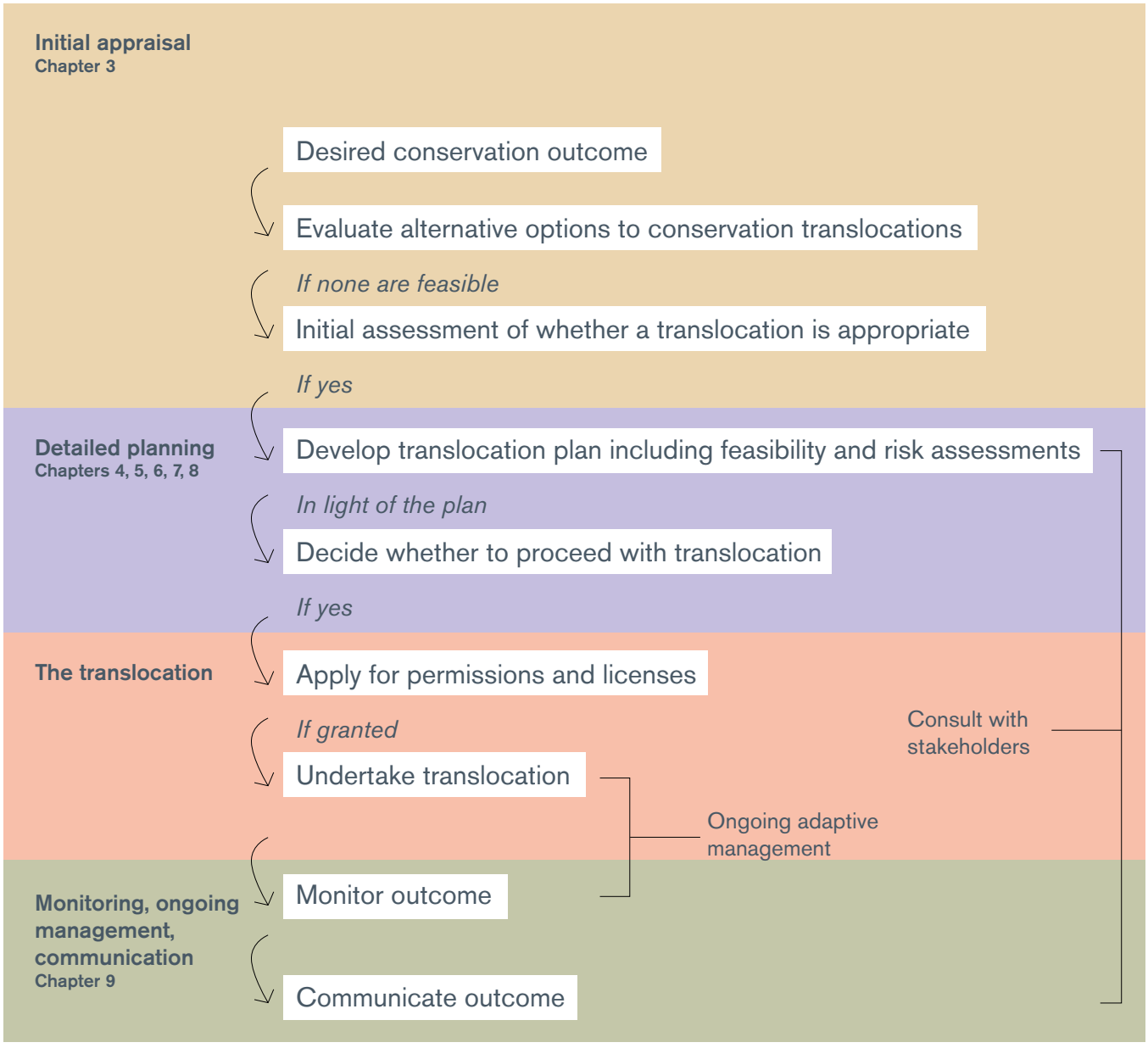


Figure 3.
Key stages of a conservation translocation

Great crested newt

These Best Practice Guidelines follow the structure presented in Fig 3.

- Chapter 3 covers the initial appraisal steps
- Chapters 4, 5, 6, 7, 8 deal with the detailed planning including legal aspects (Chapter 5), key aspects of species biology that influence translocation strategies (Chapter 6), biological risks associated with translocations (Chapter 7), and the benefits and risks to wider society (Chapter 8)
- Chapter 9 deals with monitoring/ongoing management and reporting of the findings.

Paperwork and permissions

A Translocation Project Form is given in Appendix 1 and an electronic version is available via the SNH website. This is structured to record what has been translocated, where it came from and where it was released, as well as the expected benefits, necessary permits/permissions/legislation, and steps taken to reduce the risk of negative outcomes. It is based on the framework introduced in Chapter 3. In general, it is recommended that the form in Appendix 1 is used for all conservation translocations. This form has been designed to harmonise with SNH's species licensing process and should be used as the basis for any formal licensing applications to SNH (and when consulting with SNH and other agencies during the planning of a translocation).

When completed, the form should be sent to translocations@snh.gov.uk. It will then be added to a new Scottish Conservation Translocations database which will be accessible from 2015 (environmentally sensitive information and personal data will not be made public). This database will also provide a facility for housing monitoring data and details of any published outputs arising from projects (see Chapter 9).

The aim of the Scottish Conservation Translocations database is to provide a central repository of information to help inform future translocation proposals and wider conservation work.

Will there be a mountain of unnecessary paperwork and endless form-filling?

No, the paperwork required is in proportion to the potential impacts of the translocation. The Translocation Project Form (Appendix 1) is based around a traffic light system. If there are no 'amber' or 'red light' answers, then the paperwork process can be completed in a few hours, and subject to landowner permissions being granted, is an exercise in 'self-certification and recording what was done' rather than 'a formal application to proceed'.

This 'fast-track' route for straightforward, low-risk translocations does involve checking that the translocation is truly low risk, and a key step here is to ensure that all people undertaking conservation translocations know what they need to be aware of.

In cases where the translocation is not straightforward (e.g. 'amber or red light' due to a legal constraint, or a risk of negative biodiversity or societal impacts) then greater detail of planning, consultation and formal permissions are required. The extent of this will vary depending on the complexity of the proposed translocation.

Appendix 2 gives an example of a completed form for a low-risk translocation.

Initial appraisal

Chapter 3: Initial appraisal

Is a conservation translocation the most appropriate way of achieving the conservation benefit?

Conservation translocations can involve both benefits and risks. Benefits range from a local improvement in the status of a species, to rescue from extinction. Risks can range from small-scale damage to the release site, to major socioeconomic costs or significant loss of biodiversity if the translocated organisms become invasive or give rise to unintended consequences. Conservation translocations are often costly and time consuming, and although some translocations succeed, many do not.

Prior to undertaking a conservation translocation it is important to assess whether the intended conservation benefit could better be achieved through alternative approaches.

The IUCN guidelines summarise the following alternatives to conservation translocations:

- Area-based solutions – wider habitat management or restoration including the establishment of corridors to maximise survival and natural establishment of the focal species
- Species-based solutions – targeted management including control of pathogen, predator or invasive species, food provision, assisted reproduction, or protective fencing
- Social/indirect solutions – establishment of protected areas, changes in legislation or regulations, public education, community-based conservation, financial incentives or compensation to promote viability and reduce threats to wild populations
- No action – a viable option if there is real potential for the focal species to adapt naturally or move to new suitable habitat without human intervention

If alternative approaches are not feasible, or cannot provide the intended conservation benefit, then a conservation translocation may be appropriate.

A translocation will typically form part of a broader plan involving other conservation actions.

Evaluation of whether a conservation translocation is appropriate involves assessing:

- The types of benefits that may emerge from conservation translocations
- An overview of legislative considerations
- The types of risks, and therefore the level of risk assessment and detail of planning required

Each of these themes is covered in more detail in subsequent chapters.

In the remainder of this chapter, the aim is to provide a rapid and initial assessment for users to see whether there are clear conservation benefits to the translocation, additional socio-economic benefits, and to promote awareness of legislative constraints and risks.

This section also helps to identify translocations which are more likely to be lower risk, relatively simple, and could proceed more quickly.

What are the benefits of the translocation?

A basic requirement of any conservation translocation is that it should deliver a conservation benefit. Those benefits may be to the species being translocated, or to its habitat/ecosystem. In addition there may be socio-economic benefits to individuals or society. Table 1 provides a framework for evaluating the types and levels of conservation benefit for a given translocation.

Table 1. Examples of benefits associated with conservation translocations

Beneficiary	Benefit type	Level of benefit* Low	Medium	High
Focal Species	***Reducing extinction risk and/or improving the conservation status of a species by:***			
	Increasing the number of individuals, improving population structure, and/or increasing the number of locations at which a species occurs			
	Improving the genetic health and resilience of a population by directly introducing genetic diversity			
	Establishing 'bridging populations', to facilitate migration and/or gene flow			
	Establishing populations in areas where the species will experience reduced levels of threat (e.g. by moving organisms into more suitable 'climate space', disease-free areas, or localities with suitable management)			
Habitat / Ecosystem	***Improving the conservation status of an ecosystem, habitat and/or other species by:***			
	Increasing the overall species richness of a habitat to enhance its biodiversity value			
	Increasing habitat quality (e.g. translocating species to change grazing regimes)			
	Improving ecosystem services and functions (e.g. translocating species to provide pollinator services)			
People	***Additional socio-economic benefits that may arise as a result of conservation translocations through:***			
	Enriched human experiences and environmental awareness due to increased contact with biodiversity			
	Increased benefits to humans from ecosystem services (e.g. pollination)			
	Increased income (e.g. revenue from ecotourism where the translocated species leads to increased visits or spend)			

*Low value benefits are those which make little appreciable difference to people or the conservation status of the species/habitats/ecosystems concerned. Medium value benefits are those which bring some gains, such as improving the local or regional conservation status of a species or habitat, or socioeconomic benefit to a small number of individuals. High value benefits are those which improve the national/international conservation status of a species or habitat, or bring appreciable socioeconomic benefits to communities or wider groups of society.

Initial appraisal

What are the legislative constraints and biological or socioeconomic risks from the translocation?

Tables 2, 3 and 4 outline the scales of planning, permissions and consultation in relation to legislative requirements and likely biological or socioeconomic risks associated with a translocation. This allows the user to distinguish between simple situations which can be relatively 'fast-track' versus more complicated cases that require a far more detailed appraisal. Thus for any particular attribute (e.g. a row in the tables), the level of planning, scrutiny, legislative process and/or risk is indicated (e.g. the columns).

Examples of translocations which would be consistent with a fast-track process include the local movement of a poorly-dispersed, non-protected, self-pollinating, small plant species. In contrast, proposals for translocating a legally-protected, wide-ranging, top-level predator across international boundaries and outwith its natural range would be subjected to intensive scrutiny, and permissions may not be granted. The majority of proposed translocations will fall between these two extremes.

If there is any uncertainty regarding the potential risks, impacts or legislative constraints of a given conservation translocation, consult SNH for advice.

Small cow-wheat

Table 2. Examples of legislation associated with conservation translocations
(See Chapter 5 for further details)

Degree of constraints (statutory and non-statutory) on:	Low	Medium (should involve consultation with SNH or other relevant body)	High (covered by formal legislation)
Translocated species	No formal species protection	Scottish Biodiversity List	EPS, protection under the Wildlife & Countryside Act 1981 or equivalent All freshwater fish species
Release site (current)	No formal conservation protection – landowner permission should be sought	Release site is (or is in proximity to) a National Park, Important Plant Area, Local Nature Reserve, National Scenic Areas or similar	Release site is (or is in proximity to) a SSSI, SAC, SPA, NNR, Ramsar site Release site is outwith the native range of focal species Release site contains protected species which may be affected by the translocation
Release site (post-release)	No change likely	Establishment of the translocated species may result in legal protection being applied to some specific places (e.g. its breeding sites/ resting places) that may impact on its management (e.g. may add hurdles to planning applications)	Establishment of the translocated species may result in site designation
Source population site	No formal conservation protection - landowner permission should be sought	Source population is located in a National Park, Important Plant Area, Local Nature Reserve, National Scenic Areas or similar	Source population is located in a SSSI, SAC, SPA, NNR, or Ramsar site Source population is from another country
Animal welfare	No legislative welfare protection (e.g. invertebrates)	Handling and movement of vertebrates	Actions that may cause harm to vertebrates
Quarantine/biosecurity	Local movements of species not covered by biosecurity legislation and not known to pose a biosecurity risk	Any long distance translocations Any cases where there is the possibility (or uncertainty as to the possibility) of pest and pathogen transmission	Species carries serious disease/biosecurity risks (e.g. on list of notifiable diseases/ restricted movement) and/ or any translocation across international borders
Dangerous species	Benign organisms	Organisms that could potentially harm humans during the translocation process	Animals listed by the Dangerous Wild Animals Act 1976

All translocations should seek land-owner permissions for the source and release sites.

Initial appraisal

Table 3. Examples of biological risks associated with conservation translocations
(See Chapter 7 for further details)

Risk attribute	No/Low risk: Self-certification	Medium risk: Advisory (should involve consultation with SNH or other relevant body)	High risk: Detailed evaluation (and specialist advice)
Distance of the translocation	Local movement (e.g. within local authority area), typically covering distances that are within dispersal potential for the species under 'ideal' habitat conditions	Regional movement (e.g. between major regions within Scotland)	(Inter)national movement. This applies to 'outwith Scotland' but particular attention will be given to translocations from outwith Great Britain
Threat to the source population	Source population is one of many that is large in size and removal of individuals/ propagules for the translocation will have no discernible effect	Individuals are sourced from moderately sized populations of species of conservation importance, or from one of only very few remaining large populations	All potential source populations are small in size, and removal of individuals may have a direct and measurable impact on the remaining population
Establishment following the translocation may cause loss/ reduction of important habitat	Very unlikely (e.g. most bryophytes)	May result in moderate changes in species composition (e.g. some small generalist herbivores)	May lead to clearly recognisable impacts and major habitat change (e.g. some large herbivores)
Establishment may cause loss/ reduction of important species	Very unlikely (e.g. most bryophytes)	May lead to impacts on vulnerable species (e.g. scrub restoration may negatively impact on an existing ground flora)	May lead to clearly recognisable impacts and/or loss of other species (e.g. predators)
Translocation may spread pests and diseases	No known significant problems (e.g. small cow-wheat)	Known to suffer significantly from native pathogens and pests (e.g. montane willows)	Known to suffer from major problems (e.g. amphibians/ chytrid fungi) Translocations of aquatic species
Hybridisation threat (intra-specific races or inter-specific)	No known problems (e.g. translocating individuals of a self-pollinating plant species which does not hybridise with other species of conservation concern)	Potential for significantly increased hybridisation with uncommon species or translocation involves mixing populations that have been separated for long periods of time and hence may lead to genetic incompatibilities	Known to hybridise with economically important species, or species of conservation concern, that occur at (or close) to the release site (e.g. salmonids)
Species is likely to spread beyond the confines of the release site	Poorly dispersed and likely to be contained within the confines of the release site	Species has potential for effective spread beyond the release sites	Species has the potential to be invasive (e.g. is known to be invasive in other places)
Potential for animal welfare concerns to released animals or those they interact with	No concerns due to perceived lack of sentience (e.g. plants)	Moderate concern (e.g. invertebrates) and/or general concerns associated with handling and movement	Significant (vetebrates), especially where actions may cause harm (e.g. improper/ inappropriate transit cases for vertebrates)

Table 4: Examples of socioeconomic risks associated with conservation translocations
(See Chapter 8 for further details)

Risk attribute	No/Low risk: Self-certification	Medium risk: Advisory (should involve consultation with SNH)	High risk: Detailed evaluation (and specialist advice)
Likelihood of strong social resistance by some to translocation	Unlikely	Some minor concerns (e.g. bats - concerns that roosts would impact on building permits)	Likely to cause major opposition from some groups (e.g. predators being released near commercially important species)
Harm to human health and well-being	No known risks to human health	Presents a minor risk to human health (e.g. stings, irritation) or rare occurrence of serious impact (e.g. bats and rabies)	Presents a potential risk to human health i.e. serious illness or injury (e.g. large carnivore or vector for harmful pathogen)
Harm to human livelihoods	Unlikely	Small scale impacts on pets and livestock	Significant concern (e.g. killing livestock, harming populations of commercially important species, restricting access to commercially important sites)
Insufficient resources may prevent successful implementation of the translocation plan	Translocation is low cost	Translocation is expensive but well resourced	The translocation may run over multiple years making it difficult to guarantee funding and a shortfall may lead to animal welfare issues, or inadequate management (resulting in negative conservation outcomes or socioeconomic problems)
Major financial costs once the translocation has been completed (e.g. control measures if the population has greater impacts than envisaged)	Unlikely	There is a concern that the translocation may have impacts which require ongoing management	There is a possibility of a very expensive and large scale 'reversal' programme should the translocation have adverse outcomes

Following this initial appraisal, if there are clear benefits to the translocation and the legislative requirements and risks seem surmountable - the next step is to formalise the planning process and evaluate these issues in more detail.

This framework can thus be built upon, with the level of detail proportionate to the scale of the proposed translocation and the level of risk.

Detailed planning – Setting goals

Chapter 4: Setting goals

Conservation translocation 'goals' express the overall desired outcome in the form of measurable and achievable targets. For example, if the overall desired outcome is to reintroduce a given species to a particular place, the goals might specify the number of individuals and populations that the translocation is aiming to establish, and the desired extent of stakeholder satisfaction with the translocation. These goals should be associated with specific objectives which represent intermediate milestones against which progress can be assessed, and these in turn should be underpinned by clearly articulated actions that are required to deliver the objectives.

In setting these goals, and a timeline for their delivery, the IUCN ***Guidelines for Reintroductions and Other Conservation Translocations*** note that it is useful to plan in light of the commonly observed development phases of successfully translocated populations, namely:

- *The establishment phase* – the often slow initial growth as the translocated population is recovering from the translocation process and settling into its environment
- *The growth phase* – when the translocated population becomes established and its size and/or range increases until the population approaches carrying capacity
- *The regulation phase* - when the population's growth is regulated by its density leading to limitations on survival and/or recruitment

Releasing vendace fry

Detailed planning – Legislation

Chapter 5: Legislation and permissions

All conservation translocations must operate within the law. Prior to undertaking a conservation translocation it is necessary to establish which aspects of a translocation are covered by statutory restrictions.

There is a large amount of legislation that can apply to translocations, often complicated by layers of amendments and legal variations between countries, including those within the UK.

Although the legislation is complex, it can be divided into three major themes that apply to nature conservation in Scotland:

- The protection of species
- The protection of places (such as designated sites)
- The legal presumption against introducing a species to a location outwith its native range

This legislation is there to help protect and restore Scotland's biodiversity, and applies as much to those working on conservation projects as it does to those working on other things, such as development proposals.

In addition to Scottish nature conservation law, there is legislation that applies to:

- The trade and movement of species within and between countries
- Animal welfare
- Pests and diseases
- Dangerous animals
- Responsible access

The advice given here provides just a summary of the main issues.

The onus is on people undertaking translocations to check legal requirements, both within Scotland and within any other countries involved.

This advice is based around Scots law – Scots law is often different to that in the rest of the UK.

- Where legal constraints exist, the translocation project will need to operate within the terms of that legislation
- All licences and other permissions must be obtained prior to the translocation starting
- Where SNH is the licensing authority, there is an expectation that every proposal should demonstrate how it will adhere to *The Scottish Code for Conservation Translocations*. Proposals will also need to show that alternative conservation actions that would not need a licence have been fully explored

The Translocation Project Form in **Appendix 1** has been designed so that it can also serve as a species licence application form where SNH is the licensing authority.

Protection of species: Pre-release considerations

Many species of conservation importance are protected by legislation, which among other things controls the collection or movement of organisms. The primary relevant legislation in Scotland is the **Wildlife & Countryside Act 1981** (and its various amendments), referred to here as the '1981 Act', and **The Conservation (Natural Habitats, &c.) Regulations 1994** (as amended), referred to as the 'Habitats Regulations'.

Information on which species are **protected under domestic legislation** can be obtained from the SNH website.

The protection afforded to individual species varies according to the legislation protecting it. For animals, it is illegal to intentionally/deliberately or recklessly capture, injure, kill or disturb some species, or damage or destroy their breeding site or resting place. For plants and fungi, it is illegal to intentionally or recklessly pick, uproot or destroy some species, or their seeds/spores. It is also an offence to keep, possess, transport or sell some protected species.

Detailed planning – Legislation

Translocations of many protected species will require a 'species licence' from SNH. Where a licence is required, it will typically be assessed against the following considerations:

- Is there an appropriate legal purpose to the translocation? (In the case of a conservation translocation the answer would be yes, since conservation is a legal purpose)
- What other solutions have been considered and why have these been discounted?
- What is the impact of the proposed translocation on the conservation status of the population/species concerned?

The emphasis given to these different considerations will vary according to the species and how it is protected.

Donor or release sites may sometimes be 'protected places', but this does not affect the decision as to whether a species licence is required. However, if the capture or release of a protected species affects a Natura site, a 'Habitats Regulations Appraisal' must also be done before any licence can be issued (see the section on protected places below).

It is also necessary to consider whether the actions involved in translocating one species might result in an offence against another protected species. For example, this might include recklessly disturbing a protected animal species while preparing a site for a plant translocation.

In addition to the main species protection legislation described above, the **Nature Conservation (Scotland) Act 2004** (as amended), referred to here as the '2004 Act', has resulted in the production of a **'Scottish Biodiversity List'** which identifies species considered by Scottish Ministers to be of principal importance (many of which are also covered by the above species protection legislation). The 2004 Act requires all Public Bodies to further the conservation of biodiversity, and the Scottish Biodiversity List helps to inform this process. Therefore, as a matter of best practice, translocation projects should seek to avoid or mitigate against any significant negative impacts on species on this list.

Protection of species: Post-release considerations

A translocation of a protected species will usually result in legal protection being given to the translocated organisms at the site where they are released (this is unlikely to apply to unauthorised translocations or some conservation translocations made on a trial basis, contact SNH for details).

In the event that a legally protected translocated population subsequently requires control, culling or removal, a further species licence will be required from SNH. Licence applications will be assessed according to the nature of the problem, and the alternative solutions that have been considered and why they have been discounted. Consultation with SNH over the process, timelines and feasibility of obtaining permissions for such control, culling or removal should be undertaken during the planning phase of a translocation. Certain research or monitoring methods, for example where they involve disturbance or 'taking', may also require a species licence.

Protected places

In addition to the legislation protecting species, there is also legislation for protected places. In Scotland the most heavily protected places are Natura sites, encompassing Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and Sites of Special Scientific Interest (SSSIs). These are afforded legal protection under the Habitats Regulations and the 2004 Act.

To find out if the potential donor or release sites for a proposed conservation translocation are protected, or are in close proximity to protected places, visit SNH's **Sitelink**.

The degree of protection afforded to places will vary, according to their classification and the reason(s) they were designated. Translocations may have a significant effect on the protected place, for example a translocated species could alter the quality of the qualifying habitat, or people involved in the translocation might disturb other qualifying species. In these situations 'consent' is likely to be required from SNH.

- ***SSSIs*** - If the actions associated with a translocation are listed as 'Operations Requiring Consent' (ORCs) for the places concerned, an application for consent must be made by the land manager to SNH. The ORCs will vary between SSSIs according to the reasons for designation, and are identified on **Sitelink**. If a proposed activity on a SSSI requires a licence from SNH (such as taking a protected animal, uprooting a protected plant, or releasing or planting a species outwith its native range, see below), then SSSI consent for the same activity is not needed. Further information about the process for getting consent can be obtained from **SNH**

– ***Natura sites*** (most of which are underpinned by SSSIs) – In most cases SNH will be obliged to carry out a Habitat Regulations Appraisal, and in some of these an 'Appropriate Assessment', before deciding whether to grant a consent or the required licence. There is no set format to an Appropriate Assessment but it must address the potential for the translocation to adversely affect the integrity of all relevant Natura sites on which it is likely to have a significant effect. This means that there is no distance beyond which proposals are exempt from consideration, although common sense should be used to identify the relevant Natura sites. Further information on the appraisal process can be obtained from **SNH**

In addition to places protected by formal conservation legislation, there are also Ramsar sites, National Nature Reserves (NNRs), World Heritage Sites and Local Nature Reserves which are all classed as important from a conservation perspective in Scotland (a full list of **site designations** is provided by SNH). Details of which sites are covered by these conservation designations can be found at **Sitelink**. For these types of protected places there is no statutory requirement for consent, but it is good practice to get the land manager's permission for any translocation proposal. It is also important to note that many of these sites fall within Natura sites and/or SSSIs. For instance all Ramsar sites and NNRs in Scotland are also SSSIs (although the boundaries may differ).

Translocating organisms outwith their native range

In Scotland, there is a presumption against the release/planting of species outwith their native range, as set out in the 1981 Act. Thus conservation translocations which involve an introduction outwith 'native range' may require a 'non-native species licence' from SNH. Such a licence is to allow actions that would otherwise be offences under the 1981 Act, specifically:

– ***Animals*** – releasing, allowing to escape from captivity, or causing to be at a place outwith the control of any person, outwith its native range

– ***Plants and fungi*** – planting, or causing to grow, in the wild at a place outwith its native range

The **Code of Practice on Non-Native Species** provides advice on situations that are not covered by these offences. This includes animals kept within secure enclosures which are not considered to be released, and locations where planting is not considered to be in the wild. Certain species, including many commonly planted and 'low risk' trees, shrubs and cornfield annuals, are exempted by an exception **Order**.

The 1981 Act defines native range as *"…the locality to which the animal or plant of that type is indigenous, and does not refer to any locality to which that type of animal or plant has been imported (whether intentionally or otherwise) by any person."* There is no time limit. The term 'plant' includes fungi for the purposes of the legislation. Therefore plants/fungi and animals that were introduced a long time ago are still considered to be outwith their native range (e.g. rabbit).

Likewise 'former natives' that were once native to a location but have become extinct there, and are unable to recolonise naturally, are considered to be outwith their native range for the purposes of the 1981 Act. Therefore they require a non-native species licence for reintroduction to such a location. Once a former native has been reintroduced back into a location, it does not automatically become part of its native range. Unless the barriers that prevented natural re-colonisation have been removed, human intervention is required to import further individuals, and a licence is still required for subsequent releases in that locality. For example a non-native species licence will still be required for further releases of vendace, white-tailed eagle and red kite.

Genetic differences between populations also need to be taken into account. Where different subspecies, races or types of species are recognised, a licence is required to translocate these variants outwith their native range (contact SNH for more information).

Examples of conservation translocations that are likely to be outwith native range and therefore require a non-native species licence include:

– The planting of archaeophytes in the wild

– Introductions to areas where there are no confirmed records for the species, subspecies, race or type

– All reintroductions to sites where the species, subspecies, race or type cannot naturally recolonise

– Moving land-based species onto islands where they have not been recorded

– Moving freshwater species to water bodies where they have not been recorded

Detailed planning – Legislation

If you are uncertain if a species is within its native range or exempted, the advice is to not proceed without consulting SNH. Further **guidance on native range** can be found on the SNH website.

Key considerations which will need to be satisfied before a non-native species licence can be issued include:

- What alternative options have been considered for the conservation management of the species and why have these been discounted?
- What threats does the translocated species pose to the release site and wider environment?
- What actions will be taken to reduce the risk of the translocated species causing negative impacts, how will any risks be monitored and how will remedial action be implemented if any risk is realised?

Translocations involving the movement of individuals of a species, subspecies, race or type within its native range do not require a non-native species licence (although the protected species and protected places legislation described above may apply). However, consultation with SNH is advised for all cases where translocations involve moving species across national borders, or large distances (e.g. inter-regional translocations) within Scotland since these are more likely to involve different subspecies, races or types, for which a non-native species licences would be required.

If the release of a non-native species affects a Natura site, a 'Habitats Regulations Appraisal' must also be done before any licence can be issued (see the section on protected places above).

Translocations involving fish

Any conservation translocation of a freshwater fish species to a Scottish site will require another type of licence from **Marine Scotland**. This is a requirement under Section 33A of the **Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003** (as amended), referred to here as the '2003 Act'. This makes it an offence for any person without a licence to intentionally introduce any live fish or spawn of any fish into inland waters, or possess them with the intention of introducing them.

Therefore, a fish translocation may need a number of different licences. For instance, a conservation translocation of vendace to a Scottish loch would require a licence from Marine Scotland under the 2003 Act, together with a species licence and a non-native species licence under the 1981 Act from SNH. If the donor or release sites are protected places, there would also be a requirement for relevant consent from SNH.

Translocations involving other countries

Where translocations involve moving organisms between countries the legislative requirements of each country must be adhered to. Therefore, in addition to Scots law, if organisms are collected from Scotland and released elsewhere, or collected elsewhere and released in Scotland, the national regulations and permit procedures in the other countries involved must be addressed. SNH will require evidence that the necessary licences and permissions have been organised in the other countries before issuing any Scottish licences or consents.

- ***Translocations between Scotland and other parts of the UK*** - Scots law is different to that in the rest of the UK. This includes the key legislative instruments referred to in these Guidelines (e.g. the Habitats Regulations, the 1981 Act, the 2004 Act and the 2003 Act). The relevant statutory agencies therefore need to be consulted if translocations involve other parts of the UK to obtain advice on their licensing requirements
- ***Translocations between Scotland and non-UK countries*** - All EU Member States, including the UK, are bound by the Habitats Directive and Birds Directive which have been transposed into domestic legislation. There will be differences in how these Directives have been transposed into the relevant domestic legislation of the other Member States. When planning any translocation that involves other countries check with the relevant statutory bodies in the countries concerned. The same general advice applies to countries outwith the EU
- ***International movement of species*** - The Convention on the International Trade in Endangered Species of Wild Fauna and Flora (**CITES**) places constraints on the international movement of CITES-listed species. The species covered by CITES are **listed** in three Appendices according to the degree of protection they receive and permits are required to allow the legal import or export of those species

  The national CITES Management Authorities (MAs) of the countries of import and export/re-export are the contact point for information on the rules that

apply (CITES provides a list of MAs). In the UK, the MA is the Department for Environment, Food and Rural Affairs (DEFRA – Wildlife Division) and information on obtaining permits and applications is available from the Animal Health and Veterinary Laboratories Agency (AHVLA).

Translocations between countries also have to address legal requirements relating to pests and diseases, and animal welfare. These are described in the next sections.

Preventing the spread of pests and diseases

All conservation translocations should be designed to avoid the spread of harmful pests and diseases.

Where translocations involve moving species within Scotland or across international borders, the translocations must adhere to phytosanitary (plant health), quarantine and sanitation legislation in both Scotland and the other countries concerned (including other parts of UK if the import or export involves movement through England, Wales or Northern Ireland). Some species may host serious pests and diseases and the relevant authorities must be contacted and consulted, and the appropriate certification obtained before import or movement.

It is important to note that some pathogens may not only be transmitted via the translocated organisms, but also by equipment, footwear, vehicles etc. Therefore general biosecurity precautions need to be employed for any translocation (see Chapter 7).

Animals

Imports of animals from outwith the EU have to be made via approved Border Inspection Posts with appropriate health certification and in accordance with any relevant EU legislation for the species concerned.

The Balai Directive 92/65/EEC provides a framework of rules for trade between EU Member States in live animals and germplasm, and also imports from countries outwith the EU (for species other than horses, zebras, donkeys, mules, cattle, sheep, goats, pigs and poultry which are covered elsewhere by EU legislation). It therefore applies to non-domesticated animal species that have been captive bred or caught in the wild, and held for conservation and research as well as display and education. There are requirements for health certification, and premises for holding animals need to be 'registered' or 'approved'. Further information, and relevant application forms, can be obtained from the AHVLA.

The Rabies (Importation of Cats, Dogs and Other Mammals) Order 1974 and its various subsequent amendments impose licensing and quarantine requirements to imports of carnivores and certain other mammals. Further information on importing animals and quarantine requirements are available from the AHVLA.

Additional information on potential notifiable or zoonotic disease risks associated with animal movements, or other statutory controls on animal movements for disease control purposes may be obtained from Marine Scotland (for fish) and the Animal Health and Welfare Division of Scottish Government (for other vertebrate species and bees).

Plants

Plant health legal requirements can be complex and, due to the nature of the pathogens, may change at short notice. For example there is legislation which aims to prevent and reduce the spread of the fungus-like pathogen *Phytophthora ramorum* which can cause extensive damage and mortality in our native trees and other plants.

The general recommendation is that practitioners should consult with the Scottish Government Plant Health Team or, if the translocation involves tree/woodland species, Forestry Commission Scotland. They will be able to provide information on specific plant health requirements, notifiable diseases and any concerns about the potential to spread pests and disease during translocations.

Animal welfare

Conservation translocations should be designed to avoid stress, harm and mortality to sentient organisms. There is the potential for harm to occur at the point of capture, during transit, any holding phase, and during and after release. Animal welfare legislation, namely the Animal Health and Welfare (Scotland) Act 2006, protects the welfare of all vertebrate animals kept by man on a temporary or permanent basis. It makes it an offence to cause unnecessary suffering or to fail to take reasonable steps to ensure the welfare of animals for which a person is responsible.

All translocations should be designed to adhere to the highest standards of animal welfare and to operate within the terms of animal welfare legislation. Where the translocation involves capture or release in another country then the relevant animal welfare legislation of that country will need to be adhered to.

Detailed planning – Legislation

Certain methods of killing or taking wild animals are an offence, as set out in the Habitats Regulations and the 1981 Act. This might be relevant to conservation translocation projects (e.g. if they employ inappropriate and non-selective traps or nets).

Any transportation of animals by air must comply with the International Air Transport Association's Live Animals Regulations (LAR). This is the global standard, and their website provides a guide to transporting animals by air in a safe, humane and cost-effective manner, and in compliance with airline regulations and animal welfare standards. The LAR consists of a comprehensive classification of thousands of animal species along with the container specifications required for their transport. This also applies to any air transport within Scotland.

This chapter outlines the principal legislation relevant to conservation translocations. SNH, or other relevant statutory bodies identified above, should be consulted if there is any doubt as to whether a given conservation translocation is subject to statutory constraints.

The Dangerous Wild Animals Act

The Dangerous Wild Animals Act 1976 (as amended) regulates the keeping of certain kinds of animals listed in its schedule. Although this legislation does not apply to the approved release of listed animals, there may be other stages during a conservation translocation where such animals may need to be kept, albeit temporarily. In such cases a licence is required from the relevant local authority.

This is only likely to be relevant in a very small proportion of conservation translocation proposals. The list of species includes a small number of former native Scottish mammal species, plus adder. Further information, including advice on how to apply for a licence, is available from the Scottish Government website.

Responsible access

Part 1 of the Land Reform (Scotland) Act 2003 gives everyone statutory access rights to most land and inland water, but only for recreational purpose, or for purposes of carrying out a relevant educational activity. Since conservation translocations are not primarily a recreational or educational activity, then the access rights do not apply.

Translocation projects should therefore seek the permission of the landowners at both the donor site(s) where translocated organisms are collected from, and at the release site(s). Where the contact details of landowners are unknown, information may be obtained for a fee from the Registers of Scotland.

Detailed planning – Maximising success

Chapter 6: Maximising the likelihood of a successful translocation

To maximise the likelihood of a successful translocation, it is necessary to:

- Understand the biology of the species concerned
- Evaluate which type of translocation is required
- Select appropriate donor populations
- Match the donor populations with suitable release sites, and
- Ensure that the translocation is undertaken in a fashion which promotes the survival of the translocated organisms

The detail of how this is achieved will vary from species to species, and place to place. The IUCN ***Guidelines for Reintroductions and Other Conservation Translocations*** should be consulted for general advice. Here, we summarise the key issues outlined in the IUCN guidelines, and provide links to resources relevant to translocations in Scotland.

Understanding species biology

Translocations should be based on biological knowledge of the species concerned. The level of knowledge required will vary depending on the species and the scale of the translocation. Relevant aspects of species biology are shown in Table 5 (and a list of useful general texts on translocations is provided in **Appendix 5**).

In addition to published information, extensive expertise on the biology of Scotland's plants, animals and fungi is held by specialist natural history societies and governmental and non-governmental conservation/environmental organisations (**Appendix 6**).

Where key information is lacking on the biology of the focal species, four main options are available. The first is simply to wait until that knowledge is available. The second is to pro-actively encourage, undertake or commission research to fill the knowledge gap. The third is to obtain proxy information from related species and similar systems if a persuasive case can be made that this information is sufficiently informative and relevant. Finally, experimental or 'trial' translocations can be undertaken combining the translocation with the research. This latter approach should only be undertaken if it can be done without risk of harm (e.g. it is not acceptable to 'test' the habitat requirements of the focal species if it might cause animal welfare problems, or if it exacerbates conservation problems by leading to the loss of individuals or propagules of endangered species).

Rearing pine hoverfly in the laboratory

Detailed planning – Maximising success

Table 5. Examples of biological attributes of species relevant to translocation planning

Biological attribute:	
Reproduction	– Mating system – Mode of reproduction (e.g. sexual or asexual) – Time to sexual maturity – Seasonality and phenology of reproduction – Gestation time (e.g. pregnancy/incubation/ripening periods) – Number of offspring produced – Dormancy periods/seed-bank longevity – Birthing/hatching/germination requirements
Population dynamics	– Offspring establishment requirements – Extent and type of parental care – Patterns of individual growth and development – Social structure and behaviour – Population dynamics including natural cycles of population expansion/contraction
Movement	– Dispersal/fertilization/pollination distances and vectors – Migration patterns and pathways – Territory size – Colonisation dynamics
Environmental requirements	– Climate (e.g. precipitation, temperature, humidity, wind velocity, frost sensitivity) – Altitude and aspect – Soils/substrate
Species interactions	– Food/nutrient sources – Biotic pollinators and dispersers – Predators/herbivores – Harmful pathogens and parasites – Symbionts, commensalisms, and mutualisms (e.g. mycorrhizal fungi, nodulating bacteria)
Distinctiveness from other species/populations	– Distinctiveness from related species (e.g. clarity about which species is being translocated) – Hybridisation/introgression dynamics (understanding whether the translocated species hybridises with other species) – Intra-specific taxonomy (e.g. subspecies) – Geographically structured genetic races (phylogeographic structure) – Intra-specific variation in local adaptations (e.g. ecotypes, locally adapted populations)

Type of translocation

The type of conservation translocation will depend on the desired conservation benefit. The options include adding to existing populations (reinforcement), (re-)establishing new populations within the natural range (reintroduction), and conservation introductions of a species outwith its natural range. Given the additional risks and legislative constraints associated with out-of-range translocations (Chapters 3, 5 and 7), *out-of-range conservation introductions should only be undertaken where the desired conservation benefit cannot be obtained within-range.* Conservation introductions may be necessary if factors such as climate change, pathogen pressures, or land-use changes make it unfeasible to establish new populations within the natural range, or if the reinstatement of a key ecosystem service is otherwise prevented because the species previously providing the function is now extinct.

Where translocations aim to 'reinforce' an existing resident population to increase the number of individuals or genetic diversity (or both), an important additional step is to ensure that there are no genetic or behavioural incompatibilities between the translocated individuals and those in the resident population.

Donor populations

(a) *Wild versus* ex situ *donor sources*

Donor sources can be from a wild population, or individuals held *ex situ* (e.g. in captivity, or a seed-bank/ propagation facility).

Translocations using wild population donor sources are dependent on there being:

- Sufficient populations remaining to provide suitable source material
- Enough individuals in the donor populations for them to be sampled without adverse effects
- Adequate screening/quarantine/biosecurity procedures to avoid pest/pathogen transfer
- Permissions/licences to remove individuals or their propagules from the populations

Where translocations use *ex situ* donor sources they should be designed to minimise problems from:

- Inadequate recording/mix-ups leading to confusion as to the original source locations
- Adaptation to *ex situ* conditions, reducing survival prospects in the wild
- Unwanted hybridisation when multiple, related species are held in the same facility
- Increased pathogen/parasite loads when individuals are kept *ex situ* at artificially high densities
- Low genetic diversity if the collection was established from a few individuals

These points may also be relevant when individuals are sourced from wild populations but are maintained in an *ex situ* holding phase.

(b) *Which donor population(s)*?

- As populations of many species are adapted to their local environment, it is important to match the characteristics of the donor site and its population, with the intended release site
- Wherever possible, large populations should be used as donor sources. This maximises the likelihood of obtaining a genetically diverse sample, and minimises risks to the donor population
- Single source donor populations are often appropriate where a large donor population is available with a close ecological match between the conditions at the donor and release sites
- Multiple donor populations may be appropriate if the only available populations are small (e.g. <50 breeding individuals), and/or there is a deliberate desire to maximise levels of genetic diversity
- Mixing populations to maximise genetic diversity may be appropriate if the translocation is introducing a species into a novel/changing environment, or outwith their natural range. Approaches involving bet-hedging (e.g. allowing natural selection to favour the best suited individuals) should only be undertaken if there is an adequate supply of individuals and there will be no associated and unacceptable animal welfare problems

Detailed planning – Maximising success

Release sites and strategy

(a) *Which release site(s)*?

Selection of the release site requires an understanding of the species' habitat requirements, and then searching for locations with suitable habitat that are appropriate matches for the available donor populations and that have amenable land owners and managers.

- The release site and the surrounding area should meet the species' biotic and abiotic requirements
- Recent occurrence of a species at a location should not be taken as an indicator of habitat suitability per se as the conditions may no longer be optimal
- The causes of any previous decline or loss of a species at a location should be addressed or rectified prior to the translocation
- The release site should be suitable for all life stages, and throughout all seasons
- Climate requirements should be met at a release site for the foreseeable future
- The available habitat at the release site should be large enough to support viable populations of the focal species
- The release site should be adequately isolated from sub-optimal or non-habitat areas where there is a likelihood they may act as migrant sink for the translocated population
- The release site should be selected according to whether the aim is for connectivity with existing populations, or to keep the translocated population separate/contained

The immediate location at which the release occurs should:

- Be suitable for rapid and successful establishment with limited stress/mortality
- Be suitably accessible for post-release care, management and husbandry

Ultimately selecting suitable donor populations and release sites will be based on field-based observations and specialist knowledge. However, there are useful web-based tools and Geographical Information System resources which can help find suitable sites in Scotland e.g. General Scottish environment maps; Landcover maps; Soil maps; Geological maps; Forest habitat network maps; Climate maps and projections; and Species distribution maps

(b) *The release strategy*

The release strategy should be based on:

- Identification of the optimal life stage and seasonal timing for the release (and where relevant the sex composition and social relationships of founders) e.g.
  - For plants and fungi, propagule type (whole plants/cuttings/seeds/spores etc.), and whether acclimatisation/post-release care is needed
  - For animals, age class (juvenile, adult etc.), social requirements (e.g. family groups, age/sex composition of groups etc.) and whether to release individuals immediately or have a soft-release involving some degree of confinement and/or husbandry
- An assessment of the most appropriate means of capture, transportation and 'holding' of the individuals prior to release to ensure that they are in good condition when released
- An assessment of the required number of individuals (and their expected survival rates) to achieve the intended conservation goal. **Population viability modelling** offers a useful framework for exploring potential future population trajectories, although as with any modelling approach, the scenarios generated will greatly depend on the quality of the input data

Woolly willow in cultivation

- An assessment of whether it is most appropriate to release all individuals together or to undertake a phased release (e.g. to limit conflict during establishment of territories), and whether animals which disperse away from the release site soon after release should be captured and returned (e.g. to enable an Allee effect)
- An assessment of whether to release at one or several locations at the release site. Releases at multiple locations may reduce competition and minimise risks of a single catastrophic loss; alternatively a concentrated release of individuals may be favoured in social animals or where attraction of mutualists is necessary (e.g. specialist pollinators)
- An assessment of post-release care needs to facilitate establishment and to avoid unnecessary suffering, harm or mortality

Detailed planning – Minimising biological risks

Chapter 7: Minimising the risks of negative biodiversity outcomes

A key stage in the translocation planning process is identifying which translocations, and which aspects of a given translocation, may cause harm. The detail of how this is achieved will vary from species to species, and place to place. The IUCN ***Guidelines for Reintroductions and Other Conservation Translocations*** should be consulted for general advice. Here, we summarise the key issues outlined in the IUCN guidelines, and provide links to resources relevant to translocations in Scotland.

Harm to the donor population

- Removal of organisms for translocation should only be undertaken if the donor population can sustain the losses without an appreciable reduction in population size and survival prospects
- The proportion of a population that can be safely removed will vary from species to species – particular caution should be applied where the total number of reproductive individuals and the total reproductive output is low. Where the translocated species is protected, consult with the relevant statutory body in the country concerned
- Individuals should not be selected for translocation if their removal from the donor population will result in increased harm/mortality due to disruption of social hierarchies or removal of parental/nurturing support to juveniles etc.

Harm during capture, transit and at the release site

- Collection/capture, transit, storage/holding and release should ensure appropriate conditions to avoid harm/mortality
    - For plants and fungi, this includes consideration of methods for collection, storage and planting to reduce mortality. Useful protocols on seed collection practices are provided by the **Millennium Seed Bank Partnership Kew**
    - For animals, capture methods, holding and transit facilities, and release strategies, must be designed to minimise negative impacts on welfare (e.g. stress, health, survival) and where possible to improve animal welfare status. In addition to avoiding physical suffering, actions should ensure that animals have the ability to respond appropriately to new situations and/or changes in the surroundings. It is important to note that some 'negative experiences' can promote positive welfare in the longer term (e.g. learning to avoid humans).

      Translocations that have a bearing on animal welfare should show how welfare issues have been addressed, both at the individual and group level. For example, in highly social species if a key individual (e.g. adult) is lost prior to release, the potential for this to compromise the survival of remaining individuals at release should also be considered.

      Chapter 5 provides details of the relevant legislation, but consultation with experts should be undertaken to identify the requirements and risks for individual species (e.g. the **Animal Health and Welfare Division of Scottish Government**; the **Royal Zoological Society of Scotland**; **SNH**).

      SNH's **position statement** on animal welfare emphasises the responsibility of an individual to ensure the welfare of wild animals. In many circumstances this is not a legal responsibility but rather a moral and social responsibility

- Where reinforcements are undertaken and/or multiple donor populations are used, a working rule of thumb is that problems due to genetic incompatibilities (outbreeding depression) are most likely to occur if the species is outbreeding, and:
    - The populations have been isolated for more than 500 years in similar habitats or in ecologically divergent habitats for >20 generations, and/or
    - Have known behavioural or genetic (e.g. chromosomal) differences

  Selection of less divergent donor populations (or at the very least further investigations into the likelihood and consequences of incompatibilities) are recommended in these situations
- Increased hybridisation with related species may occur if the translocation disrupts natural isolation barriers
    - Translocations should, in general, be designed to reduce the likelihood of increasing inter-specific hybridisation, except for the rare cases where hybridisation to increase genetic diversity is the target of conservation action
    - Translocation should be avoided in cases where hybridisation would provide a threat to the genetic integrity/survival prospects of threatened or economically/ecologically important species or populations
    - Information on which species hybridise can be obtained from various specialist publications on the plants, animals, and fungi of the UK, and from the experts within specialist natural history societies and organisations (**Appendix 6**)
- The potential for the translocated population to become problematically invasive should be evaluated
    - The further organisms are moved outwith their natural range, the greater the uncertainty as to how they will behave
    - Species (or their close relatives) which are known to be invasive in other places should be treated with extreme caution and the default position is to avoid their use in conservation translocations

Veterinary checks being made of white-tailed eagle

Detailed planning – Minimising biological risks

- Translocations should be designed to minimise the transmission of other harmful organisms
  - Good biosecurity practices help prevent the spread of pests and diseases
    - Comprehensive **guidance on biosecurity best practice** has been produced by Scotland's Environmental and Rural Services (SEARS) partnership. Although this advice was designed for SEARS staff, its use is recommended for conservation translocations in Scotland. It covers different levels of biosecurity control, health and safety considerations (e.g. use of disinfectants), planning site visits, and personal, vehicle and equipment biosecurity. Background information is given on some diseases of particular concern to Scotland, such as *Phytophthora ramorum* (a fungus-like pathogen that can damage native plants), *Gyrodactylus salaris* (a parasite of salmon and trout), avian influenza (a highly infectious disease of birds) and foot and mouth disease (a highly infectious virus which can affect cattle, sheep, pigs, goats and deer)
    - Information on steps to reduce the risk of spread of invasive species can be obtained from **Invasive Species Scotland** and the **GB Non-Native Species Secretariat**
    - The **Scottish Outdoor Access Code** also provides guidance on how the public can help maintain animal health and biosecurity
  - The potential diseases or parasites the focal species may be susceptible to should be identified and the risks assessed. In some situations this may require a comprehensive risk analysis for all possible pathogens that may be carried by the focal species.
    - Stress caused by the translocation may elevate infection susceptibility and/or pathogenicity
    - Individuals for translocations should be selected/treated to avoid the spread of pests and pathogens
    - Some diseases are notifiable under animal health, fish health and plant health legislation (see **Chapter 5**).

      If any exotic or notifiable animal or plant disease/pest is suspected or detected during a translocation programme, the relevant authority must be informed at the earliest opportunity.
    - If an outbreak occurs the health of the translocated population must be carefully monitored and steps to minimise impacts will be required

For animals:

- Information on various UK surveillance schemes that monitor disease in vertebrate wildlife is provided by **WILDCOMS** (Wildlife Disease and Contaminant Monitoring and Surveillance Network).
- Information on the development of methods for disease risk assessment and animal health surveillance for translocations is available from the **Zoological Society of London**
- Information on zoonotic and other disease risks associated with animal movements may be obtained from **Marine Scotland** (for fish) and the **Animal Health and Welfare Division of Scottish Government** (for other vertebrate species and bees)
- Guidance on animal health and biosecurity in relation to livestock is provided by **Scottish Government**
- Information on international animal disease monitoring and the associated risk of disease outbreaks to the UK is provided by **Defra**; **AHVLA** provides advice on importing animals and quarantine requirements; other specialists should be consulted as required

Monitoring aquatic plants at the Scottish Beaver Trial

For plants:

+ Information on disease risk associated with plant movements and imports can be obtained from the **Scottish Government Plant Health Team** or, if the translocation involves tree/woodland species, the **Forestry Commission Scotland**

+ The Scottish Government provides a useful compilation of **plant health** issues and work is underway to produce a **Scottish Plant Health Strategy**

o Where the translocation involves movement of substrates such as soils and water, care should be taken to avoid inadvertent transfer of harmful organisms via these media. Similarly, vehicles, clothing and equipment should also be checked.

+ The GB Non-Native Species Secretariat provides information through its '**Check, Clean, Dry Campaign**' on preventing the spread of aquatic invasive species

– Establishment of translocated species at the release site and elsewhere will inevitably have consequences for other organisms. An evaluation should be undertaken of any likely biodiversity loss caused by the translocation, including:

o Damage to the site (e.g. trampling/increased disturbance) by the people undertaking/monitoring/viewing the translocation

o Direct damage to other species by predation/trampling/shading/competition

o Indirect damage to other species due to habitat changes triggered by the translocation

o Particular care should be exercised when the release site and surrounding areas contain species that are threatened or are economically/ecologically important

Legal issues also apply to release sites which are protected places (see **Chapter 5**).

– Particular care should be taken when translocations involve the release of organisms onto islands

o Scotland has many hundreds of islands, and their physical isolation provides them with some natural protection from invasive species, pests and diseases. Likewise, many waterbodies are isolated and can be considered as islands in a biological sense

o Meticulous attention should be given to risk assessments involving translocations to islands or isolated water bodies to ensure that the translocation does not reduce their natural protection from invasive species, pests and diseases

o Release of species outwith their native range is an offence – this can include releases onto islands or water bodies near to places that are within their native range (see **Chapter 5**)

Scotland's Environmental and Rural Services (SEARS) Partnership hosts a website that contains links to various environmental government services and sources of advice, many of which are relevant to conservation translocations.

Detailed planning – Socioeconomics

Chapter 8: Impacts on society – Maximising benefits and minimising harm

Successful conservation translocations may bring societal benefits. These include non-monetary benefits such as enriched human experiences from increased contact with nature, as well as the potential for indirect and direct monetary benefits such as improved goods or services from nature or increased income from ecotourism. Conservation translocations may also cause harm to individuals and communities. For instance, the translocated species may harm livestock, habitats or other species, impacting on livelihoods or other established uses of the land.

Maximising benefits

Where possible, translocations should be designed in liaison with key stakeholders to maximise societal benefits.

There is a general public interest in practical conservation activities and, especially for large and/or charismatic species, the level of human interest may be high.

- There may be a trade-off between promoting public accessibility on the one hand, and access restrictions to prevent disturbance and promote the establishment and survival of the translocated organisms on the other
- Where possible, translocations should be designed to allow public viewing/contact in a fashion that minimises disturbance to the translocated species and its habitat (e.g. hides, viewing platforms, board walks, signage; with the required infrastructure being in proportion to the scale of human interest)
- Communication activities (on-site panels/displays, remote cameras and web-cams, presentations, guided tours, press releases, internet resources etc.) serve to engage the public with the conservation challenges for the translocated species as well providing a forum for engagement with wider environmental issues relevant to management of the Scottish countryside and its biodiversity

In cases where translocations involve charismatic species, there is the potential for increased tourist visits and income generation

- Maximising income from translocations will typically require an investment in marketing and promotion - the costs of this should be factored into any projected financial benefits from the translocation
- Any financial gains from a translocation should be considered in the context of costs, and particular attention should be given to reconciling the conflict that will arise if the recipients of income are different people to those incurring the costs

The translocation process itself has the potential to provide human benefits

- The activities associated with undertaking translocations can provide opportunities for volunteer involvement (providing health and educational benefits) and to strengthen community interactions, and increase the amount of spend in areas local to the donor and release sites

Minimising harm

For many translocations the risk of societal harm is limited. For instance, establishing a new population of Scottish primrose (*Primula scotica*) within its natural range is highly unlikely to have any substantial negative impact on individuals or communities. In contrast, translocations involving top-level predators or species with major ecological impacts can result in a conflict (or a perceived conflict) between the conservation goals, and the livelihoods or leisure of other stakeholder groups.

Potential problems may include:

- Predation of pets, livestock or game
- Transmission of diseases to pets, livestock or game
- The inadvertent transfer of invasive non-native species
- Habitat modifications which impact on the health and well-being of livestock or game, or in some other way impact on the viability of rural economies such as farming, forestry, fishing and hunting

- Disruption to rural economics due to the translocated population increasing human presence in sensitive and/or economically important sites
- Statutory protection of translocated species placing restrictions on land uses
- Direct harm to humans in the form of bites, stings, venom, allergic reactions and transmissible diseases

Where there is the potential for such harm, translocations should not proceed unless acceptable solutions can be developed. These may include:

- Management actions/mitigation including containment, control, damage prevention, and culling to minimise impacts
- Long-term compensation agreements to offset losses
- A viable exit strategy for reversing the translocation if unacceptable impacts occur
- A risk analysis for possible pathogens that may be carried by the focal species, followed up by appropriate planning, treatment, quarantine and monitoring
- The application of biosecurity measures such as the methods set out in the **Guidance on Biosecurity Best Practice** produced by SEARS. (Further details on biosecurity are given in **Chapter 5** and **Chapter 7**)

Stakeholder engagement

All translocation projects should include stakeholder engagement. This will ensure that anyone who can affect, or is affected by the project will have the chance to find out more, to input their own knowledge, to influence the project and to voice their views. Stakeholders may be individuals, or groups/organisations. The aim is to address any concerns through dialogue, to identify suitable mutually agreeable options/mitigation.

The scale of the process will depend on the complexity, risks and benefits associated with the translocation proposal. Low risk, very local and straightforward projects may only require engagement with some key local land users and managers, residents or interest groups. More complex, high risk projects may require a more extensive stakeholder engagement process. In the latter case, it would be appropriate to contact the local SNH Area office who may, in turn, refer it to the National Species Reintroduction Forum (**NSRF**).

The NSRF membership represents a range of stakeholders from the land use, conservation and science sectors. The overall role of the Forum is to contribute to broad scale, strategic issues relating to conservation translocations in Scotland.

Stakeholder engagement should:

- Commence at the earliest stage, so that stakeholders are involved in whether, as well as how, the project develops
- Include any individual or organisation with potential relevance, including those from the source and release sites. It is better to cast the net widely at an early stage, than to hear unexpected views later in the process
- Continue throughout the project, and (if relevant) after the translocation, to gauge changing opinions and respond appropriately to new concerns

Where concerns or objections are raised, agreement is most likely to be reached where the proposer is able to:

- Provide open, accessible and unbiased evidence indicating that the impacts are likely to fall within acceptable bounds, and/or
- Develop a working agreement/business model enabling impacted stakeholders to be recipients of benefits arising from the translocation, and
- Demonstrate clarity on responsibility and liability for any negative consequences (e.g. the presence of an adequate and stable resource base to underpin necessary management, and possibly compensation arrangements, or reversal of the translocation should unintended consequences arise)

Detailed planning – Socioeconomics

If agreement cannot be reached with stakeholders, the NSRF should be consulted via SNH. The process would be:

- The NSRF will discuss and evaluate the proposal in an advisory capacity to SNH
- Assuming SNH has a statutory licensing or consent role (which is very likely to be the case for more complex/high risk proposals), SNH will use the advice from the NSRF to help it decide whether the translocation should proceed or not, and whether a licence/consent can be issued (subject to other relevant permissions being received). The decision may be that the translocation cannot proceed, or at least not until additional work is done (which may include further addressing stakeholder engagement)

The Scottish Government also provides guidance for their own staff on how to undertake consultation exercises. This contains generally useful advice on undertaking consultation and stakeholder engagement that is relevant to conservation translocations. SNH can also provide advice on stakeholder engagement.

Anglers

Farming and forestry landscape

Monitoring, management, communication

Chapter 9: Monitoring, adaptive management, and communication

A translocation does not end once the individuals are released. Monitoring of released individuals is required to determine whether the translocation has been successful, to identify potential animal welfare issues, to assess wider impacts on biodiversity and human livelihoods, and the need for further management intervention. Recording and communicating conservation outcomes from a translocation serves to inform future translocations and promotes public engagement.

Monitoring

Monitoring is an essential component of conservation translocations. It enables the level of success or failure to be assessed, and provides a mechanism to detect problems and guide management interventions. The information obtained from monitoring one translocation can serve to inform strategies for others. It is therefore important that monitoring is incorporated into translocation planning from the outset.

The IUCN ***Guidelines for Reintroductions and Other Conservation Translocations*** outline six primary forms of monitoring:

- *Demographic performance:* This involves monitoring population growth and/or spread. Where the performance/survival of individuals is of interest, more intensive individual-level tracking and monitoring to estimate individual survival, reproduction and dispersal is appropriate (e.g. large mammals, raptors, ecosystem engineers)
- *Behavioural monitoring:* Monitoring the behaviour of translocated animals gives an indication of how well they are establishing following translocation. Behavioural monitoring can provide an early warning of likely demographic problems (e.g. if individuals are unlikely to survive or breed) or animal welfare problems
- *Ecological monitoring:* Where a translocation is designed to create or restore an ecological function, or where establishment of the focal species is likely to have ecological impacts, monitoring of habitat changes and/or ecosystem functions is required. Establishment of baseline conditions at the outset of the translocation is necessary to establish whether any subsequent changes are beneficial, benign or harmful
- *Genetic monitoring:* Genetic monitoring can be used to establish whether genetic diversity has been lost during the translocation process, and to track the integration of genes from the translocated individuals into resident populations. Because of the costs involved, genetic monitoring is mainly appropriate for those translocations in which genetic issues have been identified as critical to the translocations success
- *Health and mortality monitoring:* Health monitoring is good practice in translocations and essential in cases where there is a concern that the translocated individuals may carry pathogens. For translocations involving animals, particularly those involving vertebrates, health and mortality monitoring is also important to establish whether there are animal welfare problems caused by the translocation, and to guide management interventions
- *Social, cultural and economic monitoring:* Monitoring the direct and indirect socio-economic costs and benefits arising from a translocation is important in all cases where socio-economic implications are likely. Development of an agreed monitoring programme with community participation can be a practical means of engaging the interest and support of local people and stakeholders, and can be used to assess attitudes towards the translocation

As a minimum, all translocation programmes undertaken in Scotland should include some demographic monitoring. The level of detail, and the need (and level of detail) for other forms of monitoring will vary and should be proportional to the scale of the translocation and the associated risks. The greater the distances involved, the more sentient the organism, the greater the biological and socio-economic risks, the greater the need for extensive and detailed monitoring.

Monitoring programmes should be designed to enable progress against goals/objectives/milestones to be assessed to determine whether the translocation has been successful and/or the need for any management interventions.

The duration of the monitoring will vary on a case-by-case basis, but it should continue until either:

(a) The population is stable

(b) The population is expanding or declining in a well understood, predicable, and benign fashion

(c) The translocation has failed and the population is extinct, or

(d) The translocation is failing, and no further interventions are likely to be successful/feasible, and all necessary steps have been taken to avoid unnecessary harm, mortality or suffering to the translocated organisms.

Ongoing and adaptive management

Following translocation, ongoing management will often be necessary before the translocated population becomes self-sustaining. Management interventions may range from general habitat management aiming to maintain or establish favourable conditions, through to the nurture/care/feeding/watering of individual organisms.

'Self-sustaining' is always the desirable end-point. However, there are some situations where management interventions 'in perpetuity' may be necessary if the conditions for survival are marginal. This may occur if the available habitat at the release site is too limited in extent and/or quality for 'unsupported' survival, but no other more suitable release sites exist. There may also be a need to manage in the long-term to minimise conflict with other land uses.

In addition to 'planned' management interventions, there is typically some degree of uncertainty as to how the translocated organisms will interact with other individuals, resident species and the environment at the release site. There may thus be a need for adaptive management. This consists of a cycle starting with the translocation and monitoring. The results of the monitoring programme should be reviewed and if the translocation is not proceeding as planned, management interventions can be used to improve the health and viability of the translocated population. Similarly, if there are unintended and undesirable environmental or socio-economic impacts, existing management can be stopped or altered to minimise harm. Monitoring and refinement of management interventions should proceed in a cyclical fashion until the desired conservation outcomes are achieved. Alternatively, if the translocation has resulted in unacceptable harm, it may be necessary to implement/attempt an exit strategy to reverse the translocation.

A review of adaptive management and the lessons that can be learned from applying this approach to species conservation in Scotland will be published by SNH during 2015.

Communication

Effective and appropriate communication of conservation translocation outcomes is important.

- Landowners and land managers should be kept informed of the status, abundance, and location of translocated organisms on their land
- Conservation translocations are an effective mechanism for harnessing wider societal engagement with biodiversity and environmental challenges
- Support for conservation translocations from local communities and other stakeholders is most likely if they are well-informed
- Licences are often granted with the stipulation that the outcomes of the translocation will be recorded and the results made available
- Well-recorded and appropriately communicated translocations help develop scientific understanding and future approaches to moving organisms for conservation purposes

While information sharing and diligence in reporting are best-practice, there are nevertheless some constraints on the types of information that can be made fully accessible. Restrictions are appropriate/required where:

- Disclosure of the locations of species may result in harm due to hunting, collection, persecution or excessive disturbance
- Disclosure of personal information (e.g. landowner or stakeholder addresses) may violate **data protection rules**

A template Translocation Project Form is given in **Appendix 1**. From 2015 there will also be a web-based repository housing project details, monitoring information and published outputs from translocation projects. In addition, dissemination of information via scientific publications ('open access' where possible) and other forms of media is recommended (e.g. internet, social media, popular press, workshops, lectures and meetings).

Appendix 1: Translocation project form

Purpose of the form

- To provide a checklist of the issues to consider and address when planning conservation translocations in Scotland
- To summarise the key information needed to underpin consultation with other people or organisations that may be affected by a translocation
- To serve as a formal Project Proposal Form where translocations require permissions from Scottish Natural Heritage (including the granting of species licences)
- To provide a mechanism to document and record translocations to help inform future projects

What is in the form?

The form is structured as follows:

Sections 1-4	Contact details, the species involved and the purpose of the translocation
Section 5	Details of the donor and release sites
Section 6	Translocation methodology
Section 7	Summary of the benefits
Section 8	Permits and legal issues
Section 9	Assessment of biological risks
Section 10	Assessment of socio-economic risks
Section 11	Details of monitoring and ongoing management plans
Section 12	Summary of communication plan
Sections 13-14	Data confidentiality statement and declaration

Do I have to fill it in?

- Completion of this Translocation Project Form is recommended for all conservation translocations in Scotland as part of 'best-practice' planning
- Completion is mandatory for all conservation translocations which require licences from SNH

How to fill it in

This *Translocation Project Form* is based on *The Scottish Code for Conservation Translocations* and associated *Best Practice Guidelines for Conservation Translocations in Scotland*, and the Code/Guidelines should be consulted when completing the form. If further assistance is needed, contact **Scottish Natural Heritage**.

For low risk and uncontentious translocations, filling in the form should be straightforward. For instance, in sections 8-10, where your responses fall into the 'green light' category, just a few words are needed explaining that there are no appreciable risks or legislative issues.

Where risks or legislative constraints are identified, additional information should be provided. There is no set word-limit to this. The guidance is to succinctly express sufficient detail to enable the issues to be evaluated and understood in a clear and transparent fashion. Text boxes in the form can be expanded as required. Where translocations require a licence, but the translocation itself is intrinsically 'low risk', then the licence application process can be very straightforward. In the case of unusually complex and/or controversial translocations additional supporting information can be appended to the form.

A 'WORD' version of the form can be downloaded at **www.snh.gov.uk/translocation-code**. An example of a completed copy of the form for a relatively 'straightforward' translocation is available in Appendix 2 of the *Best Practice Guidelines for Conservation Translocations in Scotland*.

What to do with this form

For projects requiring a licence from SNH, send the completed form to:

Licensing Team
Scottish Natural Heritage
Great Glen House
Leachkin Road
Inverness
Email: **licensing@snh.gov.uk**

The licensing team will then respond to the application.

All other completed forms should be sent to:
translocations@snh.gov.uk

What happens next?

The form will be added to the Scottish Conservation Translocation database which will be accessible from 2015 (environmentally sensitive information and personal data will not be made public).

1. Lead applicant details

Name
Address
Telephone number
Email
Organisation
Position

2. Project partners (add more boxes as required)

Name
Organisation
Email
Role in project
Organisation

3. Project details

Project title
Focal species
Desired outcome(s)
Expected timescale for outcome(s) to be achieved
Goals
Proposed start date (capture/collection date(s))
Proposed release date(s)
Type of translocation (reinforcement, reintroduction, assisted colonisation, ecological replacement)
Donor source type (wild or *ex situ* or both)

4. Rationale

Overview of the project
Why is a translocation necessary?
What other options have been considered, and why have they been discounted (see **Chapter 3**)?

The level of detail provided should be proportionate to the potential impacts of the translocation

Please expand text boxes or provide additional information as required, to enable a thorough and balanced evaluation of the translocation

5. Population information

5.1. *Donor population details* (add additional pages for each donor population)

Donor Population 1
Population name
Population location (region, country)
Grid reference / coordinates (including details of coordinate system, datum etc)
Date(s) of removal

If sampled from the wild
Land owner name
Land owner contact details
Land manager name (if different to above)
Land manager contact details
Land owner/manager permission granted? (including date permission granted)
Conservation protection afforded to the site (if yes, what type)
Population size of focal species
How population size was estimated (survey method, date(s) of estimate)

If sampled from an* ex situ *collection
Name of collection owner
Collection owner contact details
Name of collection
Population size of original donor population
How original population size was estimated (survey method, date(s) of estimate)
Population size of *ex situ* population
How *ex situ* population size was estimated (survey method, time of estimate)
Ex situ population consists of captive bred/reared individuals or is the original wild-collected stock?

Number of donor individuals to be removed /sampled
Nature of donor material (e.g. eggs, seeds, larvae, adults etc)
Donor selection method (e.g. random sampling vs selection for specific traits; number of mothers when progeny sampled; collection area etc)
Habitat type of donor population (e.g. Phase 1 habitat category, NVC or HIS)
Intra-specific classification of donor population (e.g. sub-species/variety/ecotype/race)

Additional information about donor population relevant to the translocation

5.2. *Release site details* (add additional pages for each release site)

Release site 1
Population name
Population location (region, country)
Grid reference/coordinates (including details of coordinate system, datum etc)
Inside or outside of native range of translocated species or type?
Inside or outside of natural range of translocated species or type?
Date(s) of release

Land owner name
Land owner contact details
Land manager name (if different to above)
Land manager contact details
Land owner / manager permission granted? (including date permission granted)
Conservation protection afforded to the site (if yes, what type)

Habitat type (e.g. Phase 1 habitat category, NVC or HIS, or general description)
Proximity and context to other populations of the focal species

Which donor populations are being released at this site?
Distance of donor population(s) to release site
Is the donor population in the same country as release site?
Number of individuals to be released
Nature of released material (e.g. eggs, seeds, larvae, adults, sex ratios etc)
If multiple donor sources are used, what are the proportions of the mix?

If an existing population is present at the release site (reinforcement)
Population size of resident population
How population size was estimated (survey method, date(s) of estimate)
Reason for reinforcement
Intra-specific classification of *resident* population (e.g. sub-species/variety/ecotype/race)
Intra-specific classification of *donor* population(s) (e.g. sub-species/variety/ecotype/race)

Release strategy summary (including details of *what* is released *where*)

Additional information about the release site relevant to the translocation

6. Methodological summary

Outline the approaches that will be used in undertaking the translocation, including key relevant aspects of the species' biology and any specialist advice received. This should provide sufficient information to demonstrate that achieving the desired conservation outcome is feasible (see **Chapter 6** for more details of relevant issues)

How to fill in the benefits, legislation and risk sections

The following sections of the Translocation Project Form include tables summarising benefits, legislative considerations, biological risks and socioeconomic risks.

For the benefits table, indicate the types and levels of benefit.

For the tables of legislation/biological risk/socio-economic risk, delete and edit the pre-entered text to capture the relevant issues for your translocation. Use the Best Practice Guidelines to assist in this process.

Add additional rows as required if important issues for your translocation are not captured in the templates.

Where there is an appreciable benefit, legislative issue or risk (e.g. a response in the '**medium**' or '**high**' columns for any row in any table), use the text box below each table to expand on **each individual issue**:

- Benefits: explain the nature of the benefits
- Legislation
    - Where a species licence or a non-native species licence is required complete the additional *Species* or *Non-native species Licence Application Information*
    - List other permits/permissions required and obtained and the steps taken to ensure the translocation is legal
- Biological risks: outline the steps taken to mitigate against risks
- Socioeconomic risks: outline the steps taken to mitigate against problems

7. Benefits

7.1. Benefits Table (tick as appropriate)

Beneficiary	Benefit type	Level of benefit* Low	Medium	High
Focal Species	***Reducing extinction risk and/or improving the conservation status of a species by:***			
	Increasing the number of individuals, improving population structure, and/or increasing the number of locations at which a species occurs			
	Improving the genetic health and resilience of a population by directly introducing genetic diversity			
	Establishing 'bridging populations', to facilitate migration and/or gene flow			
	Establishing populations in areas where the species will experience reduced levels of threat (e.g. by moving organisms into more suitable 'climate space', disease-free areas, or localities with suitable management)			
Habitat/Ecosystem	***Improving the conservation status of an ecosystem, habitat and/or other species by:***			
	Increasing the overall species richness of a habitat to enhance its biodiversity value			
	Increasing habitat quality (e.g. translocating species to change grazing regimes)			
	Improving ecosystem services and functions (e.g. translocating species to provide pollinator services)			
People	***<u>Additional</u> socio-economic benefits that may arise as a result of conservation translocations through:***			
	Enriched human experiences and environmental awareness due to increased contact with biodiversity			
	Increased benefits to humans from ecosystem services (e.g. pollination)			
	Increased income (e.g. revenue from ecotourism where the translocated species leads to increased visits or spend)			

* Low value benefits are those which make little appreciable difference to people or the conservation status of the species/habitats/ecosystems concerned. Medium value benefits are those which bring some gains, such as improving the local or regional conservation status of a species or habitat, or socioeconomic benefit to a small number of individuals. High value benefits are those which improve the national/international conservation status of a species or habitat, or bring appreciable socioeconomic benefits to communities or wider groups of society.

7.2. Details of benefits (expand on the 'medium' and 'high' benefits identified above)

8. Legislation

8.1. Legislation table (delete/edit as applicable to present the legislation relevant to your translocation – see **Chapter 5** for further details on legislative issues)

Degree of constraints (statutory and non-statutory) on:	Low	Medium (should involve consultation with SNH or other relevant body)	High (covered by formal legislation)
Translocated species	No formal species protection	Scottish Biodiversity List	EPS, protection under the Wildlife & Countryside Act 1981 or equivalent All freshwater fish species
Release site (current)	No formal conservation protection – landowner permission should be sought	Release site is (or is in proximity to) a National Park, Important Plant Area, Local Nature Reserve, National Scenic Areas or similar	Release site is (or is in proximity to) a SSSI, SAC, SPA, NNR, Ramsar site Release site is outwith the native range of focal species Release site contains protected species which may be affected by the translocation
Release site (post-release)	No change likely	Establishment of the translocated species may result in legal protection being applied to some specific places (e.g. its breeding sites/ resting places) that may impact on its management (e.g. may add hurdles to planning applications)	Establishment of the translocated species may result in site designation
Source population site	No formal conservation protection - landowner permission should be sought	Source population is located in a National Park, Important Plant Area, Local Nature Reserve, National Scenic Areas or similar	Source population is located in a SSSI, SAC, SPA, NNR, or Ramsar site Source population is from another country
Animal welfare	No legislative welfare protection (e.g. invertebrates)	Handling and movement of vertebrates	Actions that may cause harm to vertebrates
Quarantine/biosecurity	Local movements of species not covered by biosecurity legislation and not known to pose a biosecurity risk	Any long distance translocations Any cases where there is the possibility (or uncertainty as to the possibility) of pest and pathogen transmission	Species carries serious disease/biosecurity risks (e.g. on list of notifiable diseases/ restricted movement) and/ or any translocation across international borders
Dangerous species	Benign organisms	Organisms that could potentially harm humans during the translocation process	Animals listed by the Dangerous Wild Animals Act 1976

8.2. Species or Non-native Species Licences - Additional Information (see Chapter 5)

Only complete section 8.2. if a Species or Non-native Species licence is required

When do you need a licence/licences for (start & end dates)?
Provide names, addresses and organisations (if applicable) of any additional persons you want to include on the licences (either as Agent or Assistant)
Provide your previous experience in carrying out species translocations or related activities (including details of any previous licences held in Scotland or the wider UK for similar work)
Please provide the contact details of a referee (Name, address, telephone number, email, plus licence numbers held by the referee if applicable) - only complete this if the applicant has not held a licence for similar work in the last five years

8.2.1. Species licences

List the species for which a 'species licence' is required (e.g. focal species, and/or any other species that may be affected - see Chapter 5 for more details)
What activities require a species licence? (Capture, injure, kill, pick, uproot, take, disturb, possess, transport, etc.?)
What other solutions have been considered and why have these been discounted (i.e. why can't you undertake the work in a way which does not require a licence)?
What will the impact of the proposed translocation be on the conservation status of the population/species concerned?

8.2.2. Non-native species licences

Do you need a 'non-native species licence' for the species you wish to translocate (see Chapter 5 for more details)?
What alternative options have been considered and why have these been discounted (e.g. promoting natural recolonisation)? (give further details in Section 4)
Summarise any threats the translocated species poses to the release site and wider environment? (give further details in Section 8 and 9)
Summarise actions that will be taken to reduce the risk of the translocated species causing negative impacts, how any risks will be monitored and how remedial action will be implemented if any risk is realised? (give further details in Section 8, 9 and 11)

8.3. Legislation other than Species or Non-native Species Licences

Provide a summary of permits/permissions obtained, consultation undertaken, and the steps taken to ensure the translocation is legal. This should include details of any consents needed for protected places (see Chapter 5).

9. Biological risks

9.1. Biological risk table (delete/edit as applicable – see **Chapter 7** for further details)

Risk attribute	No/Low risk: Self-certification	Medium risk: Advisory (should involve consultation with SNH or other relevant body)	High risk: Detailed evaluation (and specialist advice)
Distance of the translocation	Local movement (e.g. within local authority area), typically covering distances that are within dispersal potential for the species under 'ideal' habitat conditions	Regional movement (e.g. between major regions within Scotland)	(Inter)national movement. This applies to 'outwith Scotland' but particular attention will be given to translocations from outwith Great Britain
Threat to the source population	Source population is one of many that is large in size and removal of individuals/ propagules for the translocation will have no discernible effect	Individuals are sourced from moderately sized populations of species of conservation importance, or from one of only very few remaining large populations	All potential source populations are small in size, and removal of individuals may have a direct and measurable impact on the remaining population
Establishment following the translocation may cause loss/ reduction of important habitat	Very unlikely (e.g. most bryophytes)	May result in moderate changes in species composition (e.g. some small generalist herbivores)	May lead to clearly recognisable impacts and major habitat change (e.g. some large herbivores)
Establishment may cause loss/ reduction of important species	Very unlikely (e.g. most bryophytes)	May lead to impacts on vulnerable species (e.g. scrub restoration may negatively impact on an existing ground flora)	May lead to clearly recognisable impacts and/ or loss of other species (e.g. predators)
Translocation may spread pests and diseases	No known significant problems (e.g. small cow-wheat)	Known to suffer significantly from native pathogens and pests (e.g. montane willows)	Known to suffer from major problems (e.g. amphibians/ chytrid fungi) Translocations of aquatic species
Hybridisation threat (intra-specific races or inter-specific)	No known problems (e.g. translocating individuals of a self-pollinating plant species which does not hybridise with other species of conservation concern)	Potential for significantly increased hybridisation with uncommon species or translocation involves mixing populations that have been separated for long periods of time and hence may lead to genetic incompatibilities	Known to hybridise with economically important species, or species of conservation concern, that occur at (or close) to the release site (e.g. salmonids)
Species is likely to spread beyond the confines of the release site	Poorly dispersed and likely to be contained within the confines of the release site	Species has potential for effective spread beyond the release sites	Species has the potential to be invasive (e.g. is known to be invasive in other places)
Potential for animal welfare concerns to released animals or those they interact with	No concerns due to perceived lack of sentience (e.g. plants)	Moderate concern (e.g. invertebrates) and/or general concerns associated with handling and movement	Significant (vetebrates), especially where actions may cause harm (e.g. improper/ inappropriate transit cases for vertebrates)

9.2.

Details of steps taken to mitigate any biological risks and an appraisal of whether it is 'safe to proceed'. Also detail any consultation undertaken and specialist advice received.

10. Socioeconomic risks

10.1. Socioeconomic risk table (delete/edit as applicable – see **Chapter 8** for further details)

Risk attribute	No/Low risk: Self-certification	Medium risk: Advisory (should involve consultation with SNH)	High risk: Detailed evaluation (and specialist advice)
Likelihood of strong social resistance by some to translocation	Unlikely	Some minor concerns (e.g. bats - concerns that roosts would impact on building permits)	Likely to cause major opposition from some groups (e.g. predators being released near commercially important species)
Harm to human health and well-being	No known risks to human health	Presents a minor risk to human health (e.g. stings, irritation) or rare occurrence of serious impact (e.g. bats and rabies)	Presents a potential risk to human health i.e. serious illness or injury (e.g. large carnivore or vector for harmful pathogen)
Harm to human livelihoods	Unlikely	Small scale impacts on pets and livestock	Significant concern (e.g. killing livestock, harming populations of commercially important species, restricting access to commercially important sites)
Insufficient resources may prevent successful implementation of the translocation plan	Translocation is low cost	Translocation is expensive but well resourced	The translocation may run over multiple years making it difficult to guarantee funding and a shortfall may lead to animal welfare issues, or inadequate management (resulting in negative conservation outcomes or socioeconomic problems)
Major financial costs once the translocation has been completed (e.g. control measures if the population has greater impacts than envisaged)	Unlikely	There is a concern that the translocation may have impacts which require ongoing management	There is a possibility of a very expensive and large scale 'reversal' programme should the translocation have adverse outcomes

10.2.

Details of steps taken to mitigate socioeconomic problems and an appraisal of whether it is 'safe to proceed' (including information on stakeholder consultation, specialist advice received, and how any concerns have been addressed)

11. Monitoring and adaptive management (see Chapter 9)

Outline the type, frequency, and duration of planned monitoring

Outline the arrangements for ongoing management, including an appraisal of the feasibility of reversing the translocation should unacceptable outcomes occur

Will biological specimens (e.g. DNA samples, museum specimens) be collected during the translocation and monitoring?
If so, describe the nature of the specimens
Where will they be housed? (institution and contact person)

12. Communication plan (see Chapter 9)

Outline the plan for communicating the process and outcomes of the translocation (including steps to inform future translocations, stakeholder communication, and public engagement)

13. Data confidentiality (delete/edit as applicable)

I give my permission for the information in this form to be included in the Scottish Translocation Database I give my permission for the information in this form to be included in the Scottish Translocation Database with the following exceptions: specify *Note that personal information and geographically sensitive information will not be made public*

14. Declaration

- I declare that this translocation will be undertaken in accord with ***The Scottish Code for Conservation Translocations*** and associated Best Practice Guidelines.
- For translocations which require SNH to grant a Species and/or Non-native species licence, I agree to the terms of the licence application:
    - *Applicants should note that it is an offence under Section 17 of the Wildlife and Countryside Act 1981 and under Regulation 46 of the Conservation (Natural Habitats &c) Regulations 1994 to knowingly or recklessly provide false information in order to obtain a licence.*
    - *I understand that failure to comply with any conditions included on any licence granted in respect of this application may constitute an offence.*
    - *I declare that the particulars given in this application and any accompanying documents are true and accurate to the best of my knowledge and belief, and I apply for a licence in accordance with these particulars.*
    - *If a licence is granted, I agree to send to SNH a written report of the licensed activities within one month of the expiry of the licence.*

Signed
Date

Appendix 2: Worked example of a translocation project form

Note the example given here is for a real species, but a hypothetical translocation.

1. Lead applicant details

Name	Josephine Bloggs
Address	Department of Biology, Biology Building, Newtown, Scotland
Telephone number	**********
Email	**********
Organisation	University of Middle Scotland
Position	Lecturer in Conservation Ecology

2. Project partners (add more boxes as required)

Name	Anne Another
Organisation	SNH
Email	**********
Role in project	Advisory
Name	Dr John Smith
Organisation	Forest Research
Email	**********
Role in project	Advisory

3. Project details

Project title	*Melampyrum sylvaticum* Recovery Project
Focal species	Small cow-wheat *Melampyrum sylvaticum*
Desired outcome(s)	To increase the number of populations of small cow-wheat in Scotland
Expected timescale for outcome(s) to be achieved	5 years
Goals	To undertake an experimental translocation to reintroduce small cow-wheat into a single site with success defined as more than 100 individuals successfully established at the site after 5 years
Proposed start date (capture/collection date(s))	August 2014
Proposed release date(s)	August 2014
Type of translocation	Reintroduction
Donor source type (wild or *ex situ* or both)	Wild-collected seed

4. Rationale

Overview of the project

Small cow-wheat is an annual plant found in Scotland at 19 isolated sites. Of these, only five sites have >500 plants and seven have <100 individuals. The species was previously more widespread in Scotland and recent surveys undertaken by the Scottish Wildlife Trust suggest 84% loss of previously occupied sites.

This translocation aims to establish the species at a new site within its natural range. The translocation is experimental and aimed at understanding whether current protocols will work in establishing a new viable population. The outcomes of this translocation will be used to refine procedures for future translocations into new sites.

Why is a translocation necessary?

Translocation is necessary as the limited dispersal of the species reduces the likelihood of expanding its current range and/or recolonizing previous sites. Existing populations are threatened by changes in grazing, leading to an increase in ground vegetation, disturbances such as landslides, vehicles, trampling and the unauthorised dumping of waste (e.g. aggregates from track maintenance), and a warming climate. At most locations small cow-wheat persists in fragments of suitable habitat that are vulnerable to one or more of these threats and whilst some threats can be managed, many sites are so inaccessible and the populations so small that it is impossible to guarantee their protection into the long-term. There is therefore, a strong case for finding sites that can support the species in the long-term, moving seeds to these sites manually to overcome the dispersal limitation and acting quickly to undertake the translocations whilst there are healthy donor populations to source seeds from.

What other options have been considered, and why have they been discounted (see **Chapter 3**)?

Small cow-wheat in Scotland occurs at sites that are already managed for conservation or are marginal to commercial interests and therefore have escaped intensive human use. Most land owners are therefore happy to maintain the status quo and small cow-wheat persists in Scotland as a result. Positive management steps have been taken to protect some populations such as fencing and interpretive materials to increase the awareness of visitors and prevent trampling. Small scale translocations have been implemented to move seeds into patches of suitable habitat that surround existing populations and canopy thinning has been undertaken to maintain the open woodland that favours the species. Despite these measures, small cow-wheat still faces an uncertain future due to its presence in small and isolated populations. In addition, small cow-wheat is a species of cool conditions and prefers sites with relatively high humidity, usually provided by a neighbouring burn or loch. For some populations, it may be impossible to maintain the microclimate required by small cow-wheat and its limited dispersal ability makes natural migration to other suitable sites unlikely.

The level of detail provided should be proportionate to the potential impacts of the translocation

Please expand text boxes or provide additional information as required, to enable a thorough and balanced evaluation of the translocation

5. Population information

5.1. *Donor population details* (add additional pages for each donor population)

Donor Population 1	
Population name	Old wood
Population location (region, country)	Perthshire, Scotland
Grid reference / coordinates (including details of coordinate system, datum etc)	**********
Date(s) of removal	August 2014

If sampled from the wild	
Land owner name	**********
Land owner contact details	**********
Land manager name (if different to above)	**********
Land manager contact details	**********
Land owner/manager permission granted? (including date permission granted)	June 2014
Conservation protection afforded to the site (if yes, what type)	None
Population size of focal species	2000
How population size was estimated (survey method, date(s) of estimate)	Direct count. Surveyed July 2012

If sampled from an* ex situ *collection	
Name of collection owner	n/a
Collection owner contact details	n/a
Name of collection	n/a
Population size of original donor population	n/a
How original population size was estimated (survey method, date(s) of estimate)	n/a
Population size of *ex situ* population	n/a
How *ex situ* population size was estimated (survey method, time of estimate)	n/a
Ex situ population consists of captive bred/reared individuals or is the original wild-collected stock?	n/a

Number of donor individuals to be removed/sampled	500 seeds
Nature of donor material (e.g. eggs, seeds, larvae, adults etc)	Seeds
Donor selection method (e.g. random sampling vs selection for specific traits; number of mothers when progeny sampled; collection area etc) Selection of ripe seed pods from throughout accessible areas of the population. Collection area is approximately 20m x 10m. A maximum of 200 mother plants sampled.	
Habitat type of donor population (e.g. Phase 1 habitat category, NVC or HIS) U16 Luzula sylvatica–Vaccinium myrtillus tall-herb community with patches of W17 Quercus petraea–Betula pubescens– Dicranum majus woodland	
Intra-specific classification of donor population (e.g. sub-species/variety/ecotype/race)	Not known

Additional information about donor population relevant to the translocation

Each plant can produce >50 seeds and hence the total number of seeds removed is a small proportion of the total produced.

5.2. *Release site details* (add additional pages for each release site)

Release site 1	
Population name	New wood
Population location (region, country)	Perthshire, Scotland
Grid reference/coordinates (including details of coordinate system, datum etc)	**********
Inside or outside of native range of translocated species or type?	Outside
Inside or outside of natural range of translocated species or type?	Inside – but see comment below
Date(s) of release	August 2005

Land owner name	**********
Land owner contact details	**********
Land manager name (if different to above)	**********
Land manager contact details	**********
Land owner / manager permission granted? (including date permission granted)	June 2014
Conservation protection afforded to the site (if yes, what type) The site is within the Highland Perthshire Forest Habitat Network (no formal legislative protection)	

Habitat type (e.g. Phase 1 habitat category, NVC or HIS, or general description)	W11
Proximity and context to other populations of the focal species Geographically isolated from all other populations of small cow-wheat (nearest population is 25 km away).	

Which donor populations are being released at this site?	Old wood, Perthshire, Scotland
Distance of donor population(s) to release site	25 km
Is the donor population in the same country as release site?	Yes
Number of individuals to be released	Approximately 500
Nature of released material (e.g. eggs, seeds, larvae, adults, sex ratios etc)	Seed
If multiple donor sources are used, what are the proportions of the mix?	n/a

If an existing population is present at the release site (reinforcement)	
Population size of resident population	n/a
How population size was estimated (survey method, date(s) of estimate)	n/a
Reason for reinforcement	n/a
Intra-specific classification of *resident* population (e.g. sub-species/variety/ecotype/race)	n/a
Intra-specific classification of *donor* population(s) (e.g. sub-species/variety/ecotype/race)	n/a

Release strategy summary (including details of *what* is released *where*) Releases will comprise of seeds sown into small exclosures to prevent removal by animals. The area within which the seeds will be sown will be no more than 10m x 20m reflecting the extent of natural populations.

Additional information about the release site relevant to the translocation The release site falls within the general area occupied by the species' natural range, although there is no definitive evidence that the species has occurred at this particular site before.

6. Methodological summary

Outline the approaches that will be used in undertaking the translocation, including key relevant aspects of the species' biology and any specialist advice received. This should provide sufficient information to demonstrate that achieving the desired conservation outcome is feasible (see **Chapter 6** for more details of relevant issues)

Seeds will be taken from throughout the accessible areas of the donor population and sampled from ripe seed pods. Translocations will be implemented rapidly with seed being in transit for no more than 48 hours and using established horticultural protocols for this species. Trials of germinating small cow-wheat seeds in garden, glasshouse and field conditions indicate that 40% germination of seed is a realistic expectation. Seeds will be protected using 30 x 30 x 30 cm mesh 'exclosures' to prevent removal of seeds or grazing of plants.

Reference: Crichton *et al*. (2012). Horticultural protocols to aid the conservation of *Melampyrum sylvaticum*, Orobanchaceae (Small cow-wheat), an endangered hemiparasitic plant. *Sibbaldia* 10, 57-69

How to fill in the benefits, legislation and risk sections

The following sections of the Translocation Project Form include tables summarising benefits, legislative considerations, biological risks and socioeconomic risks.

For the benefits table, indicate the types and levels of benefit.

For the tables of legislation/biological risk/socio-economic risk, delete and edit the pre-entered text to capture the relevant issues for your translocation. Use the Best Practice Guidelines to assist in this process.

Add additional rows as required if important issues for your translocation are not captured in the templates.

Where there is an appreciable benefit, legislative issue or risk (e.g. a response in the '**medium**' or '**high**' columns for any row in any table), use the text box below each table to expand on **each individual issue**:

- Benefits: explain the nature of the benefits
- Legislation
    - Where a species licence or a non-native species licence is required complete the additional *Species* or *Non-native species Licence Application Information*
    - List other permits/permissions required and obtained and the steps taken to ensure the translocation is legal
- Biological risks: outline the steps taken to mitigate against risks
- Socioeconomic risks: outline the steps taken to mitigate against problems

7. Benefits

7.1. Benefits Table (tick as appropriate)

Beneficiary	Benefit type	Level of benefit* Low	Medium	High
Focal Species	***Reducing extinction risk and/or improving the conservation status of a species by:***			
	Increasing the number of individuals, improving population structure, and/or increasing the number of locations at which a species occurs		✓	
	Improving the genetic health and resilience of a population by directly introducing genetic diversity	✓		
	Establishing 'bridging populations', to facilitate migration and /or gene flow	✓		
	Establishing populations in areas where the species will experience reduced levels of threat (e.g. by moving organisms into more suitable 'climate space', disease-free areas, or localities with suitable management)		✓	
Habitat/Ecosystem	***Improving the conservation status of an ecosystem, habitat and/or other species by:***			
	Increasing the overall species richness of a habitat to enhance its biodiversity value		✓	
	Increasing habitat quality (e.g. translocating species to change grazing regimes)	✓		
	Improving ecosystem services and functions (e.g. translocating species to provide pollinator services)	✓		
People	***<u>Additional</u> socio-economic benefits that may arise as a result of conservation translocations through:***			
	Enriched human experiences and environmental awareness due to increased contact with biodiversity		✓	
	Increased benefits to humans from ecosystem services (e.g. pollination)	✓		
	Increased income (e.g. revenue from ecotourism where the translocated species leads to increased visits or spend)	✓		

* Low value benefits are those which make little appreciable difference to people or the conservation status of the species/habitats/ecosystems concerned. Medium value benefits are those which bring some gains, such as improving the local or regional conservation status of a species or habitat, or socioeconomic benefit to a small number of individuals. High value benefits are those which improve the national/international conservation status of a species or habitat, or bring appreciable socioeconomic benefits to communities or wider groups of society.

7.2. Details of benefits (expand on the 'medium' and 'high' benefits identified above)

Improving the conservation status of the focal species: this is a relatively small-scale experimental translocation of a threatened Scottish species. If it is successful, it has the benefit of establishing translocation protocols and increasing the number of places at which the species occurs. This provides insurance against loss at other sites.

Improving the conservation status of a habitat: the presence of an additional rare species will increase the biodiversity value of the release site

Socio-economic benefits: Although a relatively diminutive species, there will ultimately be some benefits to people who enjoy seeing species of conservation importance in the wild.

8. Legislation

8.1. Legislation table (delete/edit as applicable to present the legislation relevant to your translocation – see **Chapter 5** for further details on legislative issues)

Degree of constraints (statutory and non-statutory) on:	Low	Medium (should involve consultation with SNH or other relevant body)	High (covered by formal legislation)
Translocated species		Scottish Biodiversity List - SNH area office consulted; they are supportive of the translocation	
Release site (current)	No formal conservation protection - landowner permission has been obtained		
Release site (post-release)	No change expected as species lacks statutory protection		Release site is outwith the native range, a non-native species licence is required
Source population site	No formal conservation protection - landowner permission has been granted		
Animal welfare	n/a		
Quarantine/biosecurity		Consultation with pathologists at Forest Research. No known legislative issues	
Dangerous species	Small herbaceous plant - benign		

8.2. Species or Non-native Species Licences - Additional Information (see **Chapter 5**)

Only complete section 8.2. if a Species or Non-native Species licence is required

When do you need a licence/licences for (start & end dates)? 1st August 2014 – 30th August 2014
Provide names, addresses and organisations (if applicable) of any additional persons you want to include on the licences (either as Agent or Assistant) n/a
Provide your previous experience in carrying out species translocations or related activities (including details of any previous licences held in Scotland or the wider UK for similar work) Applicant is an expert on small-cow wheat conservation biology and has extensive experience of growing the plant from seed, and its habitat requirements.
Please provide the contact details of a referee (Name, address, telephone number, email, plus licence numbers held by the referee if applicable) - only complete this if the applicant has not held a licence for similar work in the last five years Prof Mary Jones, Head of Conservation, Plant Ecology Institute, Oldtown, Scotland (tel: ********; email********)

8.2.1. Species licences

List the species for which a 'species licence' is required (e.g. focal species, and/or any other species that may be affected - see **Chapter 5** for more details) n/a
What activities require a species licence? (Capture, injure, kill, pick, uproot, take, disturb, possess, transport, etc.?) n/a
What other solutions have been considered and why have these been discounted (i.e. why can't you undertake the work in a way which does not require a licence)? n/a
What will the impact of the proposed translocation be on the conservation status of the population/species concerned? n/a

8.2.2. Non-native species licences

Do you need a 'non-native species licence' for the species you wish to translocate (see **Chapter 5** for more details)? YES – the translocation is outwith native range
What alternative options have been considered and why have these been discounted (e.g. promoting natural recolonisation)? (give further details in Section 4) Natural recolonisation unlikely, effective dispersal distances are measured in metres. The species is undergoing a steep decline in Scotland and long term persistence at many current sites is uncertain. See Section 4 for further details
Summarise any threats the translocated species poses to the release site and wider environment? (give further details in Section 8 and 9) No threats identified (see sections 8 and 9). The species is benign, carries no known biosecurity risks, is poorly dispersed, and with a limited seed bank - the greatest challenge will be preventing the loss of the translocated population, rather than any harm it might cause. The translocation will adopt stringent biosecurity measures, following the SEARS guidelines. As only seed is moved between population, the risks of pathogens carried on associated substrates are low. The overall distance of the translocation is small (25km)
Summarise actions that will be taken to reduce the risk of the translocated species causing negative impacts, how any risks will be monitored and how remedial action will be implemented if any risk is realised? (give further details in Section 8, 9 and 11) Advice will be taken from the site managers about any sensitive areas / species at the donor and release sites. The release site will be visited twice after the translocation in 2014 to check that the exclosures are stable, and then followed by twice yearly visits in 2015 and 2016 to check germination and seed set. No negative impacts are envisaged. Monitoring will either be once or twice yearly from 2017-2020.

8.3. Legislation other than Species or Non-native Species Licences

Provide a summary of permits/permissions obtained, consultation undertaken, and the steps taken to ensure the translocation is legal. This should include details of any consents needed for protected places (see **Chapter 5**). Consultation undertaken with SNH area office to ensure that the species, and the donor and release sites are not subjected to legal conservation legislation

9. Biological risks

9.1. Biological risk table (delete/edit as applicable – see **Chapter 7** for further details)

Risk attribute	No/Low risk: Self-certification	Medium risk: Advisory (should involve consultation with SNH or other relevant body)	High risk: Detailed evaluation (and specialist advice)
Distance of the translocation	Local scale, 25km		
Threat to the source population	Previous research has demonstrated that hundreds of seeds may be removed from source population without harm		
Establishment following the translocation may cause loss/ reduction of important habitat	No risk: small cow-wheat cannot alter habitat beyond a few cm		
Establishment may cause loss/ reduction of important species	No risk: although parasitic, small cow-wheat has not been shown to kill hosts		
Translocation may spread pests and diseases	No known pests or diseases recorded in UK small cow-wheat (although species carries pine rust fungus in N. Europe)		
Hybridisation threat (intra-specific races or inter-specific)	No conspecifics at release site; species almost entirely self-pollinating making hybridisation highly unlikely		
Species is likely to spread beyond the confines of the release site	Highly unlikely: poorly dispersed and likely to be contained within the confines of the release site		
Potential for animal welfare concerns to released animals or those they interact with	None		

9.2.

Details of steps taken to mitigate any biological risks and an appraisal of whether it is 'safe to proceed'. Also detail any consultation undertaken and specialist advice received.

Biological risks are anticipated to be minimal or non-existent. Monitoring will be undertaken at the release site to ensure that any unforeseen impacts are dealt with early. Translocation planning has been undertaken in consultation with the UK BAP National Steering Group for small cow-wheat. Pathologists at Forest Research have been consulted and no known problems were identified. The Scottish Natural Heritage area office has been consulted, and they are satisfied with the proposal. Translocation will follow the SEARS biosecurity guidelines.

10. Socioeconomic risks

10.1. Socioeconomic risk table (delete/edit as applicable – see **Chapter 8** for further details)

Risk attribute	No/Low risk: Self-certification	Medium risk: Advisory (should involve consultation with SNH)	High risk: Detailed evaluation (and specialist advice)
Likelihood of strong social resistance by some to translocation	Very unlikely due to small size of plant, dispersal limitations and lack of environmental impact		
Harm to human health and well-being	None		
Harm to human livelihoods	None		
Insufficient resources may prevent successful implementation of the translocation plan	Low risk: due to ease of transportation and ability to carry out translocation in any weather, it is unlikely that resources will constrain action		
Major financial costs once the translocation has been completed (e.g. control measures if the population has greater impacts than envisaged)	Highly unlikely due to lack of dispersal ability and ecological impacts of the species		

10.2.

Details of steps taken to mitigate socioeconomic problems and an appraisal of whether it is 'safe to proceed' (including information on stakeholder consultation, specialist advice received, and how any concerns have been addressed)

Landowners have been consulted at every stage of planning and permission to remove/release seed sought. They will be informed of any results of the translocation. No concerns have been raised.

11. Monitoring and adaptive management (see Chapter 9)

Outline the type, frequency, and duration of planned monitoring

Following checks that the exclosures are secure in the weeks following release, seed germination will be assessed by seedling counts in April 2015. Surveys of adult population will be undertaken in July 2015. These surveys will be repeated for at least one year, and in later years until 2020 if the population survives.

Outline the arrangements for ongoing management, including an appraisal of the feasibility of reversing the translocation should unacceptable outcomes occur

No active management of translocated population is likely to be required beyond monitoring protocols mentioned above. The plants are highly unlikely to spread beyond the place they are planted. Even if they do spread, it would be meters at most, and their environmental impacts are minimal.

Will biological specimens (e.g. DNA samples, museum specimens) be collected during the translocation and monitoring?
Yes

If so, describe the nature of the specimens

Silica dried leaf tissue from each seed donor plant.

Where will they be housed? (institution and contact person)

Dr John Smith, Northern Research Station, Forest Research

12. Communication plan (see Chapter 9)

Outline the plan for communicating the process and outcomes of the translocation (including steps to inform future translocations, stakeholder communication, and public engagement)

The community of people expected to show interest in the translocation is likely to be limited to botanists and conservationists. Communications will include a project summary on the internet, and when the outcome of the translocation is known, an article in the newsletter of Botanical Society of Scotland and (if sufficiently interesting) a scientific paper. Landowners of donor and release sites have been, and will continue to be consulted/kept up to date. The outcome of the monitoring will be reported to SNH for inclusion in the Scottish Conservation Translocations Database

13. Data confidentiality (delete/edit as applicable)

I give my permission for the information in this form to be included in the Scottish Translocation Database

I give my permission for the information in this form to be included in the Scottish Translocation Database with the following exceptions: specify

**Detailed locality information on the plants should not be widely released

Note that personal information and geographically sensitive information will not be made public

14. Declaration

- I declare that this translocation will be undertaken in accord with ***The Scottish Code for Conservation Translocations*** and associated Best Practice Guidelines.
- For translocations which require SNH to grant a Species and/or Non-native species licence, I agree to the terms of the licence application:
    - *Applicants should note that it is an offence under Section 17 of the Wildlife and Countryside Act 1981 and under Regulation 46 of the Conservation (Natural Habitats &c) Regulations 1994 to knowingly or recklessly provide false information in order to obtain a licence.*
    - *I understand that failure to comply with any conditions included on any licence granted in respect of this application may constitute an offence.*
    - *I declare that the particulars given in this application and any accompanying documents are true and accurate to the best of my knowledge and belief, and I apply for a licence in accordance with these particulars.*
    - *If a licence is granted, I agree to send to SNH a written report of the licensed activities within one month of the expiry of the licence.*

Signed Signature inserted

Date 29 May 2014

Appendix 3: Glossary

Definitions relate to the context in which the terms are used in this document

Adaptation: individuals or populations that are suited to a particular set of environmental conditions

Adaptive management: a cyclical approach to conservation management in which the outcomes of management actions are used to improve and refine future management activity

Allee effect: Benefits to individuals from being present at or above a certain density (e.g. more plants can attract more pollinators and hence result in increased seed-production from any given plant)

Archaeophyte: a plant that was introduced in 'historic' times (sometimes defined as before 1500 AD) and which has become naturalised

Assisted colonisation: translocation of an organism outwith its natural range where the primary purpose is to benefit the focal species

Biosecurity: preventative measures to minimise the spread of invasive species, pests and diseases

Commensalisms: relationships among organisms where one benefits without affecting the other

Conservation introduction: a conservation translocation outwith the natural range

Conservation translocation: the intentional movement and release of a living organism where the primary objective is a conservation benefit

Demography: measuring populations including the number of individuals, representation in different age classes, and birth and death rates

Donor site/location/population: the place where translocated organisms are taken from

Ecological replacement: translocation of an organism outwith its natural range where the primary purpose is to perform a specific ecological function that has been lost through extinction

Ecosystem services: benefits received from nature and the environment

Ecotype: a variant of a species that is adapted to a particular set of environmental conditions

Ex situ: individuals or populations housed away from their natural habitat (e.g. in zoos, botanic gardens, seedbanks, cryopreservation)

Focal species: the species being translocated.

Former native: species or type that were previously native in a location but became extinct there and no longer have the potential to recolonise that location naturally. (The term 'former native' is used in Scotland in relation to 'native range', see Chapter 5 for more detail)

Genetic incompatibility: barriers to breeding and/or the production of healthy viable offspring

Genetic swamping: the replacement of the genetic types in a resident population with those of the translocated individuals

In situ: individuals or populations in their natural habitat

Indigenous: occurring naturally in a particular place

Intra-specific: within a species

Introgression: the transfer of genetic material from one species to another via hybridisation

Invasive species: species which, if not kept under control of any person, would be likely to spread and have a significant effect on biodiversity, or other environmental or socio-economic interests

Migrant sink: an area of lower-quality habitat into which individuals disperse but are ultimately less successful at surviving or breeding

Monitoring: observation and measurement of the performance of a population or the state of a habitat

Mutualist: interactions between organisms where both organisms benefit

Native range: the locality to which the animal, plant or fungus of that type is indigenous. It does not refer to any locality to which that type of animal, plant or fungus has been imported (whether intentionally or otherwise) by any person. (Note that once a type of animal or plant becomes extinct in a locality, and it is unable to re-colonise naturally, that locality is now outwith its 'native range'. The term 'native range' is used in Scottish legislation, see Chapter 5 for more detail. It is subtly different to the term 'natural range')

Natural range: the natural past or present distribution of a species or other taxonomic entity but for the direct intervention of man (natural range includes all locations where a species is *or was* indigenous).

Notifiable disease: a disease which if detected by law, must be reported to the relevant government agency

Organism: individuals or their propagules such as seed, eggs, spores, sperm or pollen

Phylogeographic structure: variation within a species which corresponds to genetically distinct geographical races

Population: a group of individuals that occur in the same place

Recipient site/location/population: the place where translocated organisms are released

Reinforcement: translocation of an organism into an existing population of the same species

Reintroduction: translocation of an organism inside its natural range from where it has disappeared

Release: the placement of living organisms into the wild

Release site/location/population: the place in which translocated organisms are released

Socio-economic: factors related to people and livelihoods

Soft-release: provision of housing and/or food etc. to help translocated organisms become established at the release site (as opposed to 'hard-release' where such provisions are not made available)

Source population: the place where translocated organisms are taken from (the donor site)

Symbionts: relationships between organisms where both organisms are dependent on each other

Taxonomic entity: a related group of organisms such as a species, or a discrete grouping within a species (e.g. a sub-species or local variants)

Translocation: the deliberate movement of organisms from one place to another

Zoonotic disease: diseases which can be transmitted between animals and humans

Appendix 4: List of acronyms

AHVLA	Animal Health and Veterinary Laboratories Agency
CITES	Convention on the International Trade in Endangered Species
DEFRA	Department for the Environment, Food and Rural Affairs
EPS	European Protected Species
EU	European Union
GB	Great Britain
IUCN	International Union for the Conservation of Nature
LAR	Live Animal Regulations
MA	Management Authorities
NNR	National Nature Reserve
NSRF	National Species Reintroduction Forum
ORC	Operation Requiring Consent
SAC	Special Area of Conservation
SEARS	Scotland's Environment and Rural Services partnership
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
UK	United Kingdom
WILDCOMS	Wildlife Disease and Contaminant Monitoring and Surveillance Network

Appendix 5: Further reading

Brooker R, Britton A, Gimona A, Lennon J, Littlewood N (2011). Literature review: species translocations as a tool for biodiversity conservation during climate change. *Scottish Natural Heritage Commissioned Report No. 440*.

Ewen JG, Armstrong DP, Parker KA, Seddon PJ (eds) (2012). *Reintroduction Biology: Integrating Science and Management.* Wiley Blackwell, Oxford, UK. pp 528.

IUCN/SSC (2013). ***Guidelines for Reintroductions and Other Conservation Translocations***. Version 1.0. IUCN Species Survival Commission, Gland, Switzerland. pp 57.

Maschinski J, Haskin KE (2012). *Plant Reintroduction in a Changing Climate.* Island Press, Washington. pp. 402.

Moehrenschlager A (accessed 2014). IUCN/SSC *Reintroduction Specialist Group* ***website***.

Soorae PS (ed) (2013). Global Reintroduction Perspectives: 2013. *Further case studies from around the globe.* IUCN/SSC Re-introduction Specialist Group & Environment Agency, Abu Dhabi, UAE. pp 282. [fourth book in a series documenting conservation translocations, all freely available **online**]

Appendix 6:	Specialist conservation organisations and natural history societies in Scotland

Organisation	Website
Amphibian and Reptile Conservation	www.arc-trust.org/
Bat Conservation Trust	www.bats.org.uk
British Arachnological Society	www.wiki.britishspiders.org.uk/
British Bryological Society	www.britishbryologicalsociety.org.uk/
British Dragonfly Society	www.british-dragonflies.org.uk/
British Lichen Society	www.thebls.org.uk/
British Trust for Ornithology*	www.bto.org
Botanical Society of Britain and Ireland	www.bsbi.org.uk
Buglife*	www.buglife.org.uk/
Bumblebee Conservation Trust*	www.bumblebeeconservation.org/
Butterfly Conservation*	www.butterfly-conservation.org/
Centre for Ecology and Hydrology	www.ceh.ac.uk/
Forestry Commission Scotland	www.forestry.gov.uk/scotland
Freshwater Life	http://new.freshwaterlife.org/home
Froglife	www.froglife.org/
Fungus.org.uk	www.fungus.org.uk/
Game and Wildlife Conservation Trust*	www.gwct.org.uk/
James Hutton Institute	www.hutton.ac.uk/
Mammal Society	www.mammal.org.uk/
Marine Conservation Society	www.mcsuk.org/
Marine Scotland	www.scotland.gov.uk/Topics/marine
People's Trust for Endangered Species	www.ptes.org
Plantlife*	www.plantlife.org.uk/scotland
Royal Botanic Garden Edinburgh*	www.rbge.org.uk/science/home
Royal Society for the Protection of Birds*	www.rspb.org.uk/scotland/
Royal Zoological Society of Scotland*	www.rzss.org.uk/
Scottish Marine Institute	www.sams.ac.uk/
Scottish Natural Heritage*	www.snh.gov.uk/
Scottish Ornithologists' Club*	www.the-soc.org.uk/
Scottish Wildlife Trust*	www.scottishwildlifetrust.org.uk/
Scottish Environment Protection Agency*	www.sepa.org.uk/
Vincent Wildlife Trust	www.vwt.org.uk/
Wildfowl and Wetland Trust	www.wwt.org.uk
Woodland Trust	www.woodland-trust.org.uk

These different organisations (and individuals within them) may have different viewpoints on the circumstance in which they support conservation translocations, and also different levels of resources. This may impact on the nature of the responses and the degree to which they are able to respond to requests for information. Their inclusion in this table should not be taken as indicative of any commitment/ views with respect to translocations.

Many of the UK-wide organisations have offices based in Scotland; details will be available via their web-sites. Organisations marked with an asterisk are members of the National Species Reintroduction Forum.

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British Association for Shooting and Conservation
Beaver-Salmonid Working Group
Buglife
Confederation of Forest Industries
Cairngorms National Park Authority
Forestry Commission Scotland
Game and Wildlife Conservation Trust
Highland Wildlife Foundation
Royal Botanic Garden Edinburgh
Royal Society for the Protection of Birds
Royal Zoological Society of Scotland
Scottish Countryside Alliance
Scottish Government
Scottish Gamekeepers Association
Scottish Environment Protection Agency
Scottish Land and Estates
Scottish Natural Heritage
Scottish Wildlife Trust

CORRESPONDING MEMBERS:

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NSRF
National Species Reintroduction Forum

Association of Salmon Fishery Boards
BASC SCOTLAND
Beaver - Salmonid Working Group
buglife Scotland
Bumblebee Conservation Trust
Butterfly Conservation Scotland
CAIRNGORMS NATIONAL PARK AUTHORITY
ÙGHDARRAS PÀIRC NÀISEANTA A' MHONAIDH RUAIDH
Confor
Forestry Commission Scotland
Game & Wildlife Conservation Trust Scotland
Highland Foundation for Wildlife
LOCH LOMOND & THE TROSSACHS NATIONAL PARK
Plantlife
Royal Botanic Garden Edinburgh
THE ROYAL ZOOLOGICAL SOCIETY OF SCOTLAND
RSPB
Scottish Canals
SCOTTISH COUNTRYSIDE ALLIANCE
The voice of the countryside
The Scottish Government
Riaghaltas na h-Alba
Scottish Land&Estates
SOC
Scottish Water
Always serving Scotland
Scottish Wildlife Trust
SEPA
Scottish Environment Protection Agency
Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad