Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Guidance for delivering invasive non-native plant control projects

Scottish Natural Heritage
Dualchas Nàdair na h-Alba
All of nature for all of Scotland
Nàdar air fad airson Alba air fad

Contents

Summary

The effective control of invasive non-native species in Scotland is a major long-term undertaking. It is vital to focus resources on priority sites with achievable outputs, i.e. effective, sustainable measures that are undertaken on a scale that deals with the source of the problem. If the project is planned and undertaken systematically, with the necessary commitment to ensure it is completed, then the results should make a lasting difference to the quality of Scotland's environment.

Introduction

This technical guide accompanies the series of documents covering the approach to prioritising non-native plant species in Scotland. It is intended for project managers and landowners who wish to develop an invasive non-native species (INNS) control project. It outlines how priority control projects should be planned, so that they are delivered in a coherent and co-ordinated way across Scotland. It marks a step change for control projects, from being based on one site or one land-holding, to being undertaken on a landscape scale, covering a number of sites in order tocontrol an entire local population.

1. Initiating a control project

1.1 Recognise the challenge of landscape-scale management

Invasive non-native plants are best managed at a landscape scale enabling collaborative actions to be negotiated and coordinated over a number of land holdings. This approach to prioritising invasive non-native plant control limits the high number of non-coordinated projects on a site-by-site basis and instead aspires to control a smaller number of entire local populations across a landscape (this is explained in section 1.3 below).

By reflecting on evidence and experience (see for example Parrott & MacKenzie, 2013 for invasive Rhododendron and the case studies of landscape-scale projects described at Appendix 1), it is clear that prioritising control projects requires a number of challenges to be met:

- A focussed project-based approach on priority sites that works at a landscape scale.
- A thorough planning phase.
- Dedicated resources available for the long-term.
- A high level of commitment.
- Acceptance that it may take a long time before final results are achieved.

1.2 Define the project area and timeframe

It could be most expedient to define a project area by the geographical or financial borders of an organisation with the capacity to support and host it, such as a National Park or Forestry Commission Scotland Conservancy or Forest District. A river catchment or peninsula of land may also form a realistic project area, with landowners and stakeholders brought together with a shared interest and point of reference.

The project will also need to continue into the long term. For example a minimum period of 10 years is suggested for rhododendron and 8 years for Giant Hogweed so that control and monitoring effort can be sustained for the appropriate duration necessary to be fully effective.

Table 1. Suggested minimum durations for monitoring and control of a selection of most common invasive non-native plant species.

Rhododendron
Rhododendron ponticum

7 years Expected Period of Control Effort

Post-control Monitoring Period 3 years

Giant Hogweed
Heracleum mantegazzianum

4 years Expected Period of Control Effort

Post-control Monitoring Period 4 years

Japanese Knotweed
Fallopia japonica

4 years Expected Period of Control Effort

Post-control Monitoring Period 2 years

Himalayan Balsam
Impatiens glandulifera

2 years Expected Period of Control Effort

Post-control Monitoring Period 5 years

Making this long-term commitment is essential, particularly for annual flowering species, to ensure that following the initial clearance phase all recovering or missed mature plants and new seedlings are controlled before they can flower and disperse seeds. It will also ensure that all dormant seeds are allowed to germinate and that these seedlings in the seedling bank can grow to a size that is visible and targetable for control.

For example, a rolling monitoring programme would allow a proportion of the project area to be checked each year for any signs of seedlings or regrowth and enable follow-on control to be planned and implemented.

1.3 Identify the population to be controlled

Control projects that target entire local populations are likely to cover a cluster of sites. Across the project area there will typically be core areas of mature seed-producing plants and more recently established areas, progressively expanding in the prevailing direction of dispersal.

For example, rhododendron seedlings rarely disperse more than 150m from flowering bushes except through facilitated long-distance dispersal. So, for the purposes of defining and mapping discrete rhododendron populations, the national approach will use a buffer zone of 150m from flowering bushes. Reference to 'entire local populations' normally means the core area(s) plus a 150m buffer zone.

However in some circumstances the extent of mature flowering bushes can extend to large areas of open hillside, some 100 ha in area, or extensive linear populations along wooded habitats, lochsides and riparian areas. In these cases other features may need to be used to identify the limit of the population to enable sensible planning and delivery of a control programme.

For some species that are dispersed along riparian areas (e.g. Giant Hogweed and Himalayan Balsam) it is essential that up-stream sources of seed bearing plants are controlled before expending effort in down-stream control projects since re-infection is highly likely and could undo the good work of a local project.

Many plant seeds are dispersed chiefly by wind, with most falling relatively close to the parent plants, although a few seedlings do establish at distance from the parent plant. Some species, e.g. Japanese knotweed, have root rhizomes that can be transported by water or as fragments in contaminated soil. This requires the setting of a suitable buffer around the target population to take account of the potential local natural and assisted dispersal mechanisms.

As seedlings might sometimes be found beyond the project buffer, the later stages of a control programme might need to search for them beyond the initial buffer zone.

1.4 Plan the project

An effective control project will have five main stages – planning and communication, initial removal, follow-up, maintenance, and recovery/restoration. Each stage can be split into manageable phases with defined objectives and milestones. The following is provided as a suggested approach for landscape clearance of invasive plants but it can be used for animal species too:

Planning and communication - Objectives and milestones

- Seek and secure the support for the project from landowners and local communities.
- Obtain information on the location, extent and type of plant to be controlled, plus information on site conditions (e.g. slope, associated vegetation, presence of ravines), risks (e.g. location of water bodies, heritage features, public access, possible positions for burning material) and suitability of site access for machinery (e.g. mulchers or chippers).

- Prepare a costed control plan that encourages all landowners to cooperate and target all local populations in the project area. Details of non-native species projects can be obtained from the GB Non-native Species Secretariat web site (http://www.nonnativespecies.org/maps/index.cfm)
- Identify the most effective control methods to be used in the project (for more information see the Non-Native Species Secretariat pages on Management Guidance)
- Identify all health and safety aspects, any permissions or licences that will be required (e.g. the application of herbicide in or near water) and approved disposal methods (Disposing of invasive plants and contaminated soil off site).
- Identify and then plan to prevent new sources of invasive non-native species coming into the control area, e.g. encourage gardeners and landowners to replace invasive non-native species with non-invasive species.
- Engage in a plan of communicating the project aims and benefits and engagement with stakeholders before the project starts. Continue communication during the project and highlight the success of the project when it has finished.

Initial Removal - Objectives and milestones

- Ensure that any permissions or licences are in place to cover any disposal methods (e.g. SEPA permissions will be required for Disposing of invasive plants and contaminated soil off site). This is particularly important where large volumes of soil or plant debris could be removed from site.
- Implement the control plan: where necessary starting with all mature flowering plants to reduce seed dispersal.
- Where necessary, work systematically on large populations: e.g. for wind dispersed plants - from the leeward edge working in the same direction as the prevailing wind: for water dispersed species - start up-stream and work downstream.
- Seek to achieve a zero seed-set by targeting any flowering plants that could disperse seed into the cleared areas.

Follow-up - Objectives and milestones

- Ensure initial control efforts have been fully effective before moving to new local mature populations. This may require a programme of monitoring at a frequency that is appropriate for the species of concern (e.g. annual or biannual flowering plants should ideally be monitored at the start of each growing season). Perennial plants can be monitored less frequently but certainly before they reach maturity and set seed.
- Remove all remaining plants before they flower/reproduce.
- Consider a search beyond the project buffer zone for outlying plants missed from the initial planning stage which could disperse into the cleared areas.

Maintenance - Objectives and milestones

- Continue to remove new seedlings, or control recovering plants, so that the rate of removal is greater than the rate of spread or recovery.
- If significant numbers of new seedlings are being continually located inside the control area, check to see if a seed source or parent population is present and dispersing into the controlled area.

Recovery and restoration - Objectives and milestones

- Consider restoring affected habitats, e.g. by enrichment planting of native trees and shrubs and wild flower reintroduction through seed sowing (if natural recovery is inhibited). Ensure any introductions are compliant with the Scottish code for conservation translocations (http://www.snh.gov.uk/protecting-scotlands-nature/reintroducing-native-species/scct/) .
- As numbers fall, monitor according to a proportionate programme, e.g. visit 25% of the project area each year on a four-year rotation.

2. Who to involve

2.1 Funders

Responsibility for the removal of invasive non-native species - such as Giant Hogweed, Himalayan Balsam, Japanese Knotweed and Rhododendron - rests with landowners. However there are a number of sources of financial support to assist control projects. For example landscape restoration projects may be eligible for Heritage Lottery Funding or LEADER and check the SNH web page Other sources of funding.

Having dedicated resources available for the long-term is vital because it allows co-ordination and monitoring to continue until the project's aims have been met.

Many current funding mechanisms for invasive species control are only available for five years or less. This is invaluable for funding initial control and short-term follow-up treatments but not for covering long-term monitoring and restoration activities.

Landowners must take some responsibility for funding elements of the control programme, and a volunteer resource may also be available. In other words, invasive non-native species control over the longer term is likely to need a package of funding and in-kind contributions.

2.2 A co-ordinator

Control operations must be co-ordinated to ensure management is consistent across all landholdings affected by the local invasive species population. Bringing in neighbouring land is vital because it:

- protects and consolidates money spent, and minimises the chance of invasion from nearby land re-colonising cleared areas;
- shows support for landowners who have already taken the initiative to tackle invasive non-native species on their own holdings; and
- encourages landowners to join in with activities 'over the fence'.

Co-ordination might be best done by a third party (such as an individual project officer, a liaison forum or an umbrella group) because they can act as brokers, seeking out the best results for the project.

A co-ordinator may be responsible for:

- liaising with and securing the support of all affected land-holders;
- surveying and mapping invasive non-native species to identify discrete populations;
- identifying and mapping ownership boundaries;
- sourcing funds and accepting liabilities attached to the contract;
- drawing up management plans and budgets, including those for the recovery of the site;
- negotiating with owners to agree work programmes;
- ensuring that control measures are implemented effectively;
- recording progress until local control is achieved; and
- monitoring site recovery.

One scenario is that a co-ordinator commissions a dedicated task force to clear the invasive non-native species and return at appropriate intervals for monitoring and follow-up actions. Once the area has stayed clear for an agreed number of years, each individual landowner then takes responsibility to maintain it in this state and undertake any clearance work if needed.

Under the Wildlife & Natural Environment Act 2011 there is a statutory mechanism whereby landowners, where a non-native species has spread from their land to the wild, can be encouraged to enter into a voluntary Species Control Agreement that can be followed up with an enforceable Species Control Order if appropriate action is not taken. Project co-ordinators would play a role in this process, ideally by encouraging landowners to seek grant aid for invasive non-native species control to enable them to carry out the required actions in the Species Control Agreement.

There could also be a creative and effective role for co-ordinators in using broadcast and social media to inform and include land managers, communities and the public in a local control project.

2.3 Landowners

Good, sustainable landowner engagement and involvement is key to the effective control of invasive non-native species, which in turn brings a number of benefits to landowners. It can help restore access for harvesting, deer management and recreation, reduce land management costs, encourage native plants, animals and trees to regenerate or expand into the area, and improve the quality of watercourses and fisheries.

Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to plant or to cause invasive non-native plant species to grow in the wild. Landowners are expected to take reasonable steps to prevent invasive non-native species from spreading into the wild: joining a local control project that follows this national approach will help demonstrate that reasonable steps were taken to comply with the Act.

2.4 Volunteers

It is crucial to involve local communities in a control project, and there will be different routes for involvement at different stages of the project.

In the early stages of a project there may be concerns that controlling some invasive non-native species (e.g. rhododendron) will cause unsightly damage or rob the area of the brightly-coloured flowers known to attract visitors. Communicating the reasons for control and the planned recovery/restoration programme, is vital.

As the project progresses, encouraging local people to volunteer on some control operations will help long-term buy-in to the project. In the later stages, local communities can be an invaluable part of monitoring for re-invasion and maintaining some restored areas.

2.5 Public bodies

Working closely with public bodies will help anchor the project in the local community and land management arenas. Examples of where there is potential for local projects to join in with larger public organisations comprise: the rhododendron control programmes set up by Forest Enterprise Scotland; and three Local Biodiversity Action Partnerships (Argyll & Bute, Highland, and Loch Lomond & the Trossachs National Park).

3 Undertaking the control project

3.1 Work in a flexible way

It can be hard to judge in advance what conditions will be encountered on site, so contracts should allow for different control methods to be used as appropriate for each site within the project area. The key principle is to identify and use whatever combination of techniques is most cost effective for that site and that will cause least environmental damage.

For example, invasive plant control operations are notoriously difficult to cost accurately because of the difficulty in gauging what plant types and density of plants are present. The range of terrain types occupied can effect control options and costs, especially rhododendron in extensive mature stands. As a consequence, contractors are generally bound to err on the side of caution when pricing jobs. Also be aware that if contractors are asked to use unfamiliar techniques such as stem treatment or hand pulling, they are likely to feel exposed to higher risk and will price accordingly.

3.2 Use the most effective control method(s) for each site

A number of methods are available for controlling invasive non-native species. Where local guidance is not available, contact the habitat lead organisation either through SEARS or direct:

General non-native species enquires and reports:

SEARS (Scottish Environment and Rural Services) 24/7 customer service number
08452 30 20 50 or email **info@sears.scotland.gov.uk** **www.sears.scotland.gov.uk**

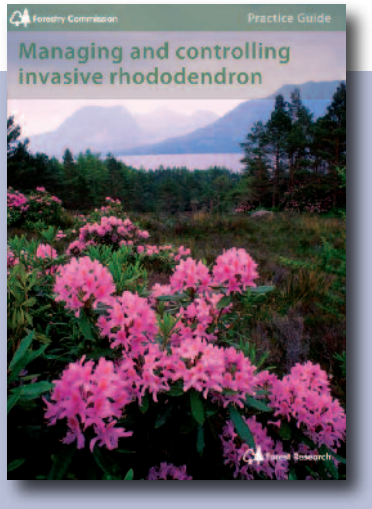
For habitat-specific enquiries, you can contact the Habitat Lead directly:

Native range (all species), terrestrial and wetland species – contact **SNH**
Woodland species – contact **FCS**
Marine species – contact **Marine Scotland**
Freshwater species – contact **SEPA**

Effective control example.

The most effective rhododendron control techniques to use are determined by the combination of bush type, terrain and post-treatment objectives for the site. Control projects should support the principles of Integrated Pest Management, by recommending minimal pesticide input, seeking non-chemical methods where possible and following good biosecurity protocols to prevent the risk of spreading another invasive species onto site.

The best practice guidance given in Edwards (2006) should be followed, and any subsequent advice published on the FCS website.



3.3 Seek advice and support

Co-ordinators should look for advice and support from public agencies, research organisations and other control projects whenever it is needed. Attending training and demonstration events are good ways to build the skills and capabilities of practitioners.

References

Edwards, C., 2006.
Managing and controlling invasive rhododendron. Forestry Commission Practice Guide. Forestry Commission, Edinburgh.

Parrott, J. & MacKenzie, N.A., 2013.
A critical review of work undertaken to control invasive rhododendron in Scotland: a report commissioned by Forestry Commission Scotland and Scottish Natural Heritage. Coille Alba, Inverness.

Appendix 1

Landscape-scale projects to control invasive plant species in the UK

1. Rhododendron control in Snowdonia

Rhododendron is a significant problem in the Snowdonia National Park in North Wales, where it affects over 2,000 ha of farmland and woodland. It poses a major threat to the Park's Atlantic oakwoods, and makes an economic impact on agriculture (loss of grazing and associated subsidies), forestry (increased costs of establishment, spread of Phytophthora) and recreation (loss of access).

The blooms have been a popular tourist attraction for many years and some owners of large gardens have expressed concern that the removal of rhododendron will result in a loss of privacy. However, public attitudes are changing, with a growing awareness of the negative impacts of rhododendron on landscape and environment. In a survey of 100 landowners, over 95% were sympathetic in principle to controlling it.

Attempts at controlling rhododendron began in the early 1970s. In 1986, a comprehensive survey was undertaken, and the Snowdonia Rhododendron Group was set up to plan and co-ordinate a control programme. This is led by the Park Authority, which commissioned the preparation of a control strategy, and the control work has been largely funded by their core funds and monies from EU Objective 1 and the Countryside Council for Wales.

The Park has trialled and refined a number of control methods over the years. Stem treatment now accounts for 40-50% of control operations, which has often been found to be the most cost-effective method. They are also exploring more creative approaches, for example looking at the possibility of providing other shrubs to garden owners to replace cleared rhododendron.

2. Giant Hogweed control on the River Tweed

The Tweed Invasives Project has been controlling giant hogweed, Japanese knotweed and Himalayan balsam on the River Tweed since 2003. Giant hogweed once dominated long sections of riverbank, riparian woodland and gravel islands. It now occurs only as occasional plants regenerated from long-buried seed.

The project is a partnership of local landowners, farmers, ghillies, fishermen and volunteers, and is led and co-ordinated by Tweed Forum. The Forum runs a range of land management, environmental and heritage projects and enjoys wide-ranging support from government agencies, the fishery trust and angling associations.

The project has taken a determined, adaptable and innovative approach to funding. It initially received Heritage Lottery Fund monies as part of a larger area-based initiative, augmenting this with agency grants and commercial sponsorship. The project has used a range of grants, LEADER and SRDP funding to maintain effort. It has also built effective partnerships with other rivers in Scotland and Ireland to gain EU INTERREG funding. The project has made good use of reports and maps to demonstrate progress and highlight the need for more effort.

The hogweed eradication programme operates at a catchment scale. Control effort has been systematic and sustained; preventing seeding was an early priority. The project has put long-term monitoring in place to prevent re-invasion.

Many local communities and angling associations were keen to rid the Tweed of giant hogweed. The project used this aspiration to help recruit volunteers, and provided training. In some areas 'river champions' have emerged to motivate and coordinate local effort. Contractors are used where volunteers are not available or specialist work such as roped access is required.

Forestry Commission Scotland
Coimisean na Coilltearachd Alba

Forestry Commission Scotland serves as the forestry directorate of the Scottish Government and is responsible to Scottish Ministers.

Contact
Forestry Commission Scotland National Office
Silvan House
231 Corstorphine Road
Edinburgh EH12 7AT

Tel: 0300 067 5000
Fax: 0300 067 3003
E-mail: fcscotland@forestry.gsi.gov.uk
www.forestry.gov.uk/scotland

If you need this publication in an alternative format, for example, in large print or in another language, please contact:

The Diversity Team
Forestry Commission
Silvan House
231 Corstorphine Road
Edinburgh EH12 7AT

Tel: 0300 067 6575
E-mail: diversity@forestry.gsi.gov.uk

Published by Forestry Commission Scotland March 2017. © Crown Copyright 2017
All images from the Forestry Commission Picture Library unless otherwise stated.