A Stitch in Time
Pwyth mewn Pryd

End of project report

August 2016

This document is available in English and in Welsh.

Sustainable Development Fund
Cronfa Datblygu Cynaliadwy

Parc Cenedlaethol Arfordir Penfro
Pembrokeshire Coast National Park

Contents

Project overview

The *Stitch in Time* project was funded by Welsh Government's Sustainable Development Fund, administered locally by Pembrokeshire Coast National Park Authority (PCNPA). The aim was to design and test a catchment-based, community and stakeholder-orientated approach to invasive plant control in the ecologically-sensitive Gwaun Valley catchment in the north of Pembrokeshire Coast National Park. The project was managed by PCNPA.

The project received approval for £25,318.25 of SDF funding in 2014. PCNPA provided match funding of £6,000 and made in-kind contributions. Natural Resources Wales contributed £5,000 during the project.

Volunteer time was an essential element of the project, with 140 person days contributed.

A temporary post of Invasive Non-Native Species Project Coordinator post (2 days per week) was created within PCNPA to deliver the project. The project ran from January 2015 to August 2016.

The project has resulted in a greater knowledge of the extent and degree of the three target Invasive Non-Native Species (INNS) - Japanese Knotweed, Himalayan Balsam and *Rhododendron ponticum* - within the Cwm Gwaun catchment. The catchment control approach adopted can be described as "top down and outside in". This was determined to be the most cost-effective way to protect the largest area and the most ecologically-sensitive parts of the catchment, while minimising reinfection risk along watercourses.

The project area

The project achieved a reduction in the extent of the three target species. Control was undertaken by volunteers, landowners, PCNPA staff and other partner organisations (for Japanese Knotweed, Himalayan Balsam, and *Rhododendron ponticum*, and for general vegetation clearance for access). Contractors were involved in Japanese Knotweed and Rhododendron control.

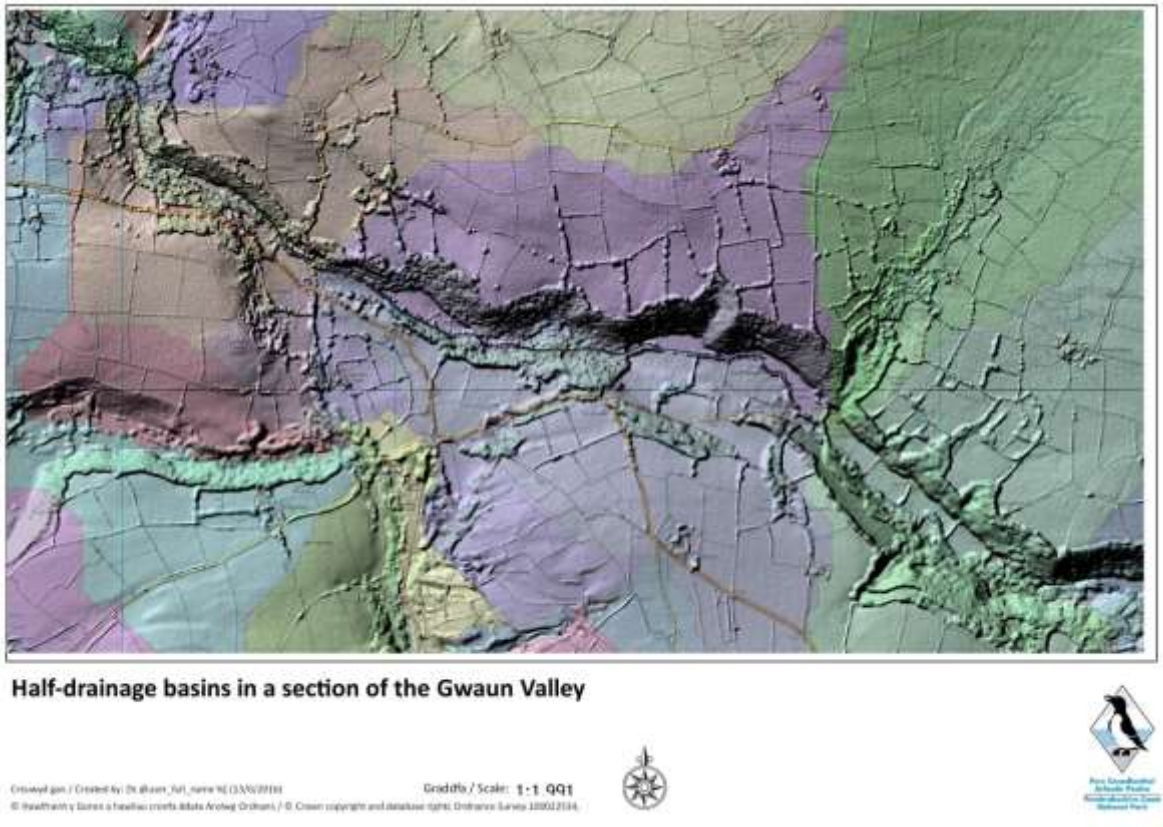
Project strategy

Pembrokeshire Biodiversity Partnership published an INNS Action Plan in 2014. This prioritises species for action according to the threat they pose. Rhododendron, Himalayan balsam and Japanese knotweed are included as priority species for control. The *Stitch in Time* project was therefore a contribution to the Biodiversity Action Plan for Pembrokeshire. The *Stitch in Time* project benefited from input from the Partnership's Biodiversity Implementation Officer.

While a number of organisations and individuals are involved with INNS control in the National Park and Pembrokeshire, the approach is often piecemeal. For example due to land ownerships, treatment may not eradicate the target species at a particular site, only control it up to a certain boundary. Such containment efforts imply indefinite treatment costs and, by leaving a source of infection, do not necessarily prevent species spread to new areas.

Systematic eradication (or near-eradication) from a defensible area is the most cost-effective solution in the long term, as management is reduced to preventing or treating any re-infestation.

Watercourses are a major dispersal pathway for INNS. Catchments, and sections of catchments, are therefore an appropriate scale at which to work. Geographic information systems (GIS) enabled the project to take a tactical approach within the catchment, based on stream order and drainage basins. Essentially, this means working from the top of a drainage unit down and from the outside in.



Half-drainage basins in a section of the Gwaun Valley

Establishing land ownerships

Existing PCNPA contacts and Land Registry services were used to establish land ownerships within the catchment where these were not known. Permission for survey was then sought.

Managing species records

The Project Coordinator and volunteers surveyed catchment sections systematically.

A feature in PCNPA's publication *Coast to Coast* (2015) sought INNS records from the public (species and location). Species records were then verified (Google Streetview proved useful for confirming records on or near highway verges), and mapped using MapInfo and QGIS/QField.

Records outside the catchment area were also mapped. All records were copied to West Wales Biodiversity Centre for central data management and sharing.

Non-target INNS were also mapped (for example Himalayan knotweed was also occasionally observed and recorded).

Approximately 65% of the catchment (southern head waters/tributaries, adjacent land where applicable including hedgerows, farm yards, property and the main river, the Afon Gwaun) have been surveyed.

Volunteer recruitment

In addition to inviting INNS records, the *Coast to Coast* feature provided a contact point for people interested in volunteering and those seeking INNS advice.

Project updates published in local press also provided contact information for volunteering opportunities within the project.

The Project Coordinator presented and displayed project information at the Pembrokeshire *Wildlife Sightings Event* and at the annual general meeting of Newport Paths Group.

Keep Wales Tidy, Pembrokeshire Rivers Trust, Cymdeithas Llandudoch and PCNPA maintain volunteer databases and potential volunteers were kept up to date with project events and work parties.

Two volunteers with no previous affiliation became registered as PCNPA Voluntary Wardens through the project.

Literature review

A literature search was conducted to establish suitable species control methods.

Control practices adopted

Himalayan balsam control took place between May and October. Volunteer work parties uprooted the plants before seed pod maturity (the pods can eject seeds 6m from the plant). A brush cutter was used by trained volunteers and the Project Coordinator to gain access to Himalayan balsam stands when surrounding vegetation was dense. Hand tools such as slashers and scythes were also used.

The Project Coordinator revisited control sites periodically to ensure that pulled plants were not re-rooting. Volunteers also subsequently monitored some sites.

The project lead of the earlier Cemaes Head Himalayan balsam Eradication Project (run by Cymdeithas Llandudoch and also funded by SDF) provided key advice on best practice.

Japanese knotweed was treated by stem injection or foliar spray between May and October. Stem injection was the preferred method (between August and October) where possible (stems >8mm), with 1-2ml of neat herbicide injected into the stem below the second node. Injection ensures direct exposure to the target plant and low/zero exposure to non-target plants or the watercourse and is therefore ideal for environmentally sensitive sites. However the subsequent regrowth of stem injected knotweed will be stunted and may not produce a stem larger enough for follow-on injection. Therefore applying for herbicide consent (for foliar spray) in good time before the following season's application is advisable.

Some areas of the catchment had been treated by contractors previously (for PCNPA) with success, and the Project Coordinator revisited these and treated other small stands, using spot spray and pull-and-dry. Volunteers who had received stem injection training via the project assisted, allowing the project's contractor resources to be directed to larger, untreated stands. In some cases, volunteers cleared vegetation near to Japanese knotweed plants to make them accessible for professional spray treatment.

In areas where past treatment has taken place knotweed stems develop too small in diameter to inject and spraying is required. Both sides of the leaves should receive chemical.

Rhododendron control was carried out by PCNPA staff and contractors between November 2015 and March 2016. Rhododendron was cut to ground level, the stump treated with herbicide and chipping, piling or removal of by-product.

Biosecurity

Biosecurity measures were taken to prevent target species spread to, within and from site.

Project impact

55% of INNS records identified during the project received treatment during 2015 and or 2016.

Himalayan balsam

The project recorded approximately 30 instances of Himalayan balsam within the catchment covering a total land area of approximately 4.5ha. Himalayan balsam was found to have formed monocultures in springs, ditches and tributary banks and has colonised farm land (some with conservation value) at tributary sites feeding the Afon Gwaun.

Effective control took place on approximately 3.5ha of sites identified with source populations. The project has achieved a reduction from thousands of stems to hundreds at target sites, allowing for example the re-colonisation of native plant species such as the nettle family (an important invertebrate life cycle plant) and more generally increasing the local diversity and abundance of native flora. Himalayan balsam control helps prevent bank destabilisation and the consequences of increased sedimentation.

Some strategic Himalayan balsam sites have been adopted by the Friends of the Pembrokeshire Coast National Park. Others have been included in PCNPA's forward work programmes and those of partner organisations and volunteer groups. Landowners have a better understanding of Himalayan balsam spread and control. Effective eradication in the catchment may be achievable by 2019.

The Project Coordinator worked with members of the Newport Paths Group to create a catchment strategy of volunteer and contractor control works on the headwater system of the Clydach valley (adjacent to

headwaters of the target catchment and a risk to it), assisted by a financial contribution by Natural Resources Wales.

Youth Rangers pulling Himalayan balsam

Friends of Pembrokeshire Coast National Park work party

Japanese knotweed

The project recorded approximately 75 instances of Japanese knotweed within the catchment, covering a total land area of approximately 9 ha. Japanese knotweed control has been focussed strategically on headwater tributaries, on sections of the main Afon Gwaun and in areas identified as an acute risk to catchment biosecurity (e.g. farmyards).

Stem injection in 2015 produced excellent results with knotweed vigour/extent reduced and/or rhizome dormancy evident in 2016. Pulling and drying was used on knotweed growing in river bank substrate during 2016. No regrowth was observed when revisited 14 days later. Japanese knotweed requires annual treatment and site monitoring into the long term. The post-project focus of resources should be on high priority sites such as headwater tributaries, designated sites and their surroundings.

Treatment at one site was compromised due to flooding in 2015 and a tree fall disturbing knotweed further in 2016.

Knotweed prior to May 2015 treatment

Impaired knotweed regrowth (May 2016)

Rhododendron ponticum

The project recorded 36 instances of Rhododendron within the catchment covering a total land area of almost 14 ha.

Control work focussed on the River Aer tributary, which rises at the head of the Trecwn valley. Access was granted to a strategic section of Trecwn valley by kind permission of Valley Management Services Ltd, for Renewable Developments Wales Ltd, who also made an in-kind contribution to the project of 13 person days. Three hectares of Rhododendron was cut, treated and processed, at Trecwn and at an adjacent site. This part of the project also benefited from additional funding from Natural Resources Wales. Coed Cymru and Tir Coed provided input and a remote sensing project (drone survey for INNS) was undertaken by a student of the University of Wales.

The work will increase the ecological integrity of Trecwn valley, reduce the amount of Rhododendron seed dispersed towards the Gwaun and the vegetative spread of Rhododendron along the River Aer. Trecwn Valley holds two strategic headwaters: the Afon Aer (Afon Gwaun) and the Nant-y-bugail (Western Cleddau).

The work has led to an ongoing partnership at Trecwn. Valley Management Services Ltd has trained its operatives in chainsaw operation in order to deliver woodland conservation management, including reduction of Rhododendron, within the valley.

Rhododendron is present to a lesser extent at other locations in the Gwaun. These instances are of limited size and have been included in PCNPA work programme.

Rhododendron control sites will require post-project monitoring for regrowth and restoration.

Cutting Rhododendron on steep slopes

Recording treatment effectiveness

QGIS was used to record the treatments applied at each site and subsequent INNS extents.

Volunteers and partner organisations

Just over 140 volunteer days were contributed to the project. 40 days were contributed in-kind by PCNPA staff and the Pembrokeshire Biodiversity Partnership's Biodiversity Implementation Officer.

The Project Coordinator contributed almost 17 additional (unpaid) days to the project.

Three volunteers and one contractor received specialist training in safe use of and application of pesticides.

Two community groups received equipment through the project to assist with control efforts within the project catchment and wider National Park.

Partner organisations included:

- Coed Cymru
- Cymdeithas Llandudoch
- Friends of the Pembrokeshire Coast National Park
- Keep Wales Tidy
- Natural Resources Wales
- Nevern Anglers
- Newport Paths Group
- Pembrokeshire Biodiversity Partnership via the Partnership's Biodiversity Implementation Officer
- Pembrokeshire Coast National Park Youth Rangers and Voluntary Wardens
- Pembrokeshire Rivers Trust
- Tir Coed
- University of Wales
- Valley Management Services Ltd and Renewable Developments Wales Ltd

Members of the Newport Paths Group mapped, liaised with landowners, organised and led Himalayan balsam work parties in the Clydach Valley in 2016.

Members of Cymdeithas Llandudoch and the Pembrokeshire Rivers Trust provided expertise throughout the whole project, including input to a Himalayan balsam leaflet.

Thanks are extended to all *Stitch in Time* volunteers and project partners.

Communication

Press releases in local newspapers and in PCNPA's own media were issued periodically.

Pembrokeshire Rivers Trust, Cymdeithas Llandudoch, Keep Wales Tidy, Natural Resources Wales and PCNPA contributed to the creation of a practical advice leaflet for Himalayan balsam control strategies.

End-of-project communication and feedback

A bilingual letter of thanks highlighting project successes and seeking feedback was sent to landowners and partners involved in the project.

An end of project social event was held by way of thanking volunteers.

Learning

Some practical points, observations and lessons learned are listed below.

Survey

Proactive survey was prioritised within and between drainage basins on a risk basis. Some gaps in survey coverage remain. A full picture of catchment infestation (tributaries, main river, adjacent land including hedgerows and animal tracks) is desirable. Survey could be subcontracted or form part of a student project. Only in very few cases (two) was access refused.

Treatment

No two sites are quite the same – all are liable to unique combinations of factors such as flooding, human disturbance etc.

Variation due to microclimate influences flowering and seeding times, which in turn affect control window and methods. Some Rhododendron was still flowering in Trecwn in November 2015, for example, while Rhododendron near Pontfaen had completed flowering by July 2015. Himalayan balsam flowered and set seed quicker (before August) at well-lit sites such as farmyards, hedges, adjacent fields; within dense undergrowth Himalayan balsam had not started to seed during August 2015. Japanese knotweed flowering also varied greatly within the catchment, with well-lit sites flowering first.

Poor weather can result in postponement of volunteer events, wet and/or windy weather prevents foliar application and flooding in winter can impact the clearance of knotweed die-back. Summer flooding (e.g. August 2015) increases rhizome, fragment and seed dispersal.

Contractors often get booked up well in advance of the treatment season (this was only an issue in the first treatment season). Early booking enables contractors to take on more operators if needed, bringing a local socio-economic benefit. Adequate time should be allowed for inspection of contractor works.

It was advantageous that the Project Coordinator already held relevant training in the safe use and application of pesticides. An additional part-time herbicide trained operative would have been advantageous. However, treatment capacity increased when 3 volunteers and one contractor received training and pledged to return 7 hours of treatment time each to the project during 2016.

The Project Coordinator furthered debate in PCNPA regarding invasive species operational policy and an informal ‘triage’ approach to prioritising INNS for treatment was developed.

Separately to the project, the Project Coordinator helped to survey and treat INNS, and procure contractors to control INNS, at other PCNPA sites and small catchments including coastal streams.

INNS transmission pathways

Collaboration is required on INNS biosecurity, awareness and education due to the transmission routes of spread such as water, contractor machinery spread, farm-to-farm spread, utility service provider spread past and present, fly tipping, etc. Landowner awareness is a key part of prevention.

River blockages can facilitate the build-up of Himalayan balsam seed banks. Flooding then spreads seed to surrounding banks, contributing to bank erosion.

Excluding river banks using fencing appears to facilitate the establishment and spread of Himalayan balsam (while also hampering management of it). Bankside INNS physically degrade habitat and reduce the ecological integrity which the un-grazed corridors might otherwise provide (i.e. INNS can disproportionately impact landscape connectivity). Grazed banks appear to be less susceptible to INNS establishment.

Other (plant) INNS, e.g. Cherry laurel and Himalayan knotweed, were recorded during survey but no control action was taken as they were outside the agreed project definition. Had additional staff and cash resources been available, it could have been be cost-effective to treat them alongside the target INNS.

Collaboration in creating a contractor service provider accreditation in the delivery of biosecure services in terms of invasive species, especially Japanese knotweed, could be worthy of investigation.

Volunteering

Practical conservation often relies heavily on volunteers and INNS projects are no exception. Involving people in INNS identification and control was a stated objective of the project and the total volunteer time contributed during the project (140 person days) is a success in itself. Without volunteers the project would have been severely limited. Any volunteer involvement should be well acknowledged and celebrated through socials, press, events and training (which doesn't necessarily need an INNS focus).

Himalayan balsam reduction success was due to large volunteer work parties. These included Friends of Pembrokeshire Coast National Park as well as Pembrokeshire Rivers Trust, Cymdeithas Llandudoch and PCNPA Voluntary Wardens, who put in continual intense effort throughout 2015 resulting in a dramatic reduction in plants present during 2016.

Not all Himalayan balsam sites are suitable for large work parties. Four volunteers (including dedicated individuals with no group affiliation) worked solely with the Project Coordinator, spending full working days undertaking survey and control. A focus for these "core volunteers" was the control of isolated Himalayan balsam stands along inaccessible ditches and hedgerows joining key tributaries.

Recruiting core volunteers (including university students who may be able to take on sub-catchment projects) before the active control season would be advantageous, and project funds could be allocated for relevant training, equipment and clothing. A number of programmes require volunteer hours (e.g. the Duke of Edinburgh's Award, Welsh Baccalaureate, and some conservation land management modules in schools and colleges). Greater use of social media could have been made in terms of core/independent volunteer recruitment.

Four trained volunteers also worked solely with the Project Coordinator treating Japanese knotweed. Occasionally, mixed availability resulted in separate dates being booked with individuals rather than the full trained group.

Local INNS projects were visited by the Project Coordinator. However it would be advantageous to budget for travel further afield to view other relevant projects, and possibly to set up a volunteer exchange programme.

Post-project

Himalayan balsam sites adopted by volunteer groups will require monitoring, with a schedule of site visits (at least once a month during key life cycle periods) for follow-up control. It may be possible to combine INNS survey with other activities, e.g. invertebrate or path survey.

Next steps

The *Stitch in Time* project has begun an adaptive, catchment- based approach to control of the three target species in the Cwm Gwaun catchment, areas of which fall outside the National Park boundary.

Effective eradication of the target species is the goal. If and when an area is deemed to be clear, monitoring for regrowth or reinfection will be needed. Volunteer effort is key to this and will be a valuable legacy of the project.

The Gwaun Valley workload would be expected to decrease in successive years, allowing new catchments to be taken on, including small catchments such as coastal streams.

Delay gives a chance for invasive species to re/colonise, so it is highly desirable to hit catchments hard and keep up the momentum of control - not least to safeguard resources already invested.

Accordingly, PCNPA is seeking funding for project continuation.