

Scottish Invasive Species Initiative Site Case Study

Japanese knotweed control at Aberfeldy, River Tay

Summary

The Aberfeldy site on the upper River Tay is a 1.5km single bank section of river in the town where Japanese knotweed was beginning to establish in a dominant fashion along the golf course side of the river. There was a risk of further spread which, had this been allowed to continue, would have seen resulting negative impacts to biodiversity and further obstruction of the existing public footpath.

The site was identified in 2018 and, after initial discussions with Aberfeldy Golf Club and Perth and Kinross Council, a solution was identified to manage the site. Work commenced in 2020 carried out by Scottish Invasive Species Initiative staff and locally recruited and trained volunteers.

The resulting control led to a significant drop in Japanese knotweed coverage of over 90% after just one year of treatment. In 2021 regrowth was much reduced, less vigorous and of a quantity that a single member of project staff or a small group of local volunteers could comfortably manage the follow up work as part of a sweep in the wider area. Since 2021, the section of riverbank has been checked annually by staff or volunteers for regrowth and any identified growth controlled.

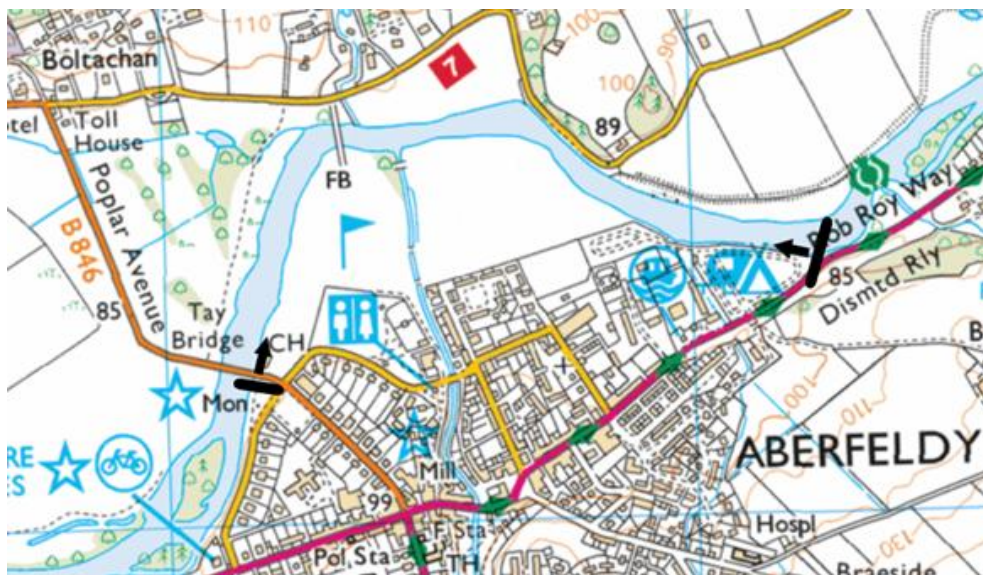
1. Site description

The Aberfeldy site is a 1.5km section of the right bank of the upper River Tay lying downstream of the Tay Bridge (grid reference NN 85150 49294) and running alongside Aberfeldy Golf Course to the end of the caravan site (grid reference NN 86240 49490).

The site is part of, and owned by, Aberfeldy Golf Course. Within the Scottish Invasive Species Initiative partnership, the Tay catchment is covered by the Tay District Salmon Fishery Board (TDSFB).

The riverbank at the site is a narrow strip of broadleaf woodland skirting the short, mown grass of the golf course. A well-used public footpath follows the treeline between the riverbank and golf course.

The River Tay is designated a Special Area of Conservation (SAC) – primary feature being the Atlantic salmon with additional qualifying features of River lamprey, Brook lamprey, Sea lamprey and Otter.



The Japanese knotweed at Aberfeldy was beginning to outcompete native flora where it grew in dense, monoculture stands. Whilst bank erosion was not identified as a current problem, the main area of established Japanese knotweed growth was on a bend of the river which may be prone to erosion when soils are left exposed after summer growth has receded.

2. Background

It is unclear when Japanese knotweed became established in Aberfeldy. However, there are significant areas of the plant upstream and so it is likely that plant fragments have become established after being washed into the site from these sources. Once it arrived on site its growth began to obstruct the riverside footpath and further local spread is likely as evidence of trampling and broken stems by human activity were seen.

The Scottish Invasive Species Initiative assessed the site in 2018 and approached Aberfeldy Golf Club to discuss potential control options – this identified the potential to work with the Upper Tay Paths Group who have a wider area of work in the upper River Tay (not just including the golf course site) and who are supported by Perth and Kinross Council. Discussions followed with the Perth and Kinross Council Greenspace Officer and it was agreed that control at the site would be started by Scottish Invasive Species Initiative staff with volunteer support, with a view to the project providing training in pesticide application for interested volunteers from the Upper Tay Paths Group. Since then, five volunteers from the group have been trained and taken the lead in the Aberfeldy area with continued project support.

3. Management works

The Japanese knotweed was treated for the first time in 2020. Glyphosate (Round-up ProVantage) was applied by stem injection (to deliver a stem specific chemical dose) in the larger more established growth areas and by foliar spray (spraying directly onto the leaves of the plant) to the smaller patches of growth.

In 2020, a second foliar spray treatment was delivered to all areas of infestation two months after the first treatment to ensure all growth was controlled. In 2021, only small regrowth was present which was treated by foliar spray. This process was continued annually from 2022 - 2025, primarily by local volunteers. Project staff became directly involved again in 2024, when it became clear that scattered areas of small knotweed growth were appearing due to cut stems and fragments washing downstream from beaver grazing activity from difficult-to-access islands a few kilometres upstream.

The site has now been moved to a biennial control program as regrowth is so minimal that it cannot be controlled annually.

Table 1 below shows a summary of the control treatments.

Table 1 – Summary of control treatments at Aberfeldy (2020 – 2025)

Year	Invasive species	Work completed by	Control work – date and method
2020	Japanese knotweed	Project staff and volunteers	16/07/21 – Foliar spray and stem injection 18/09/20 – Foliar spray
2021	Japanese knotweed	Project staff	16/09/21 – Foliar spray
2022	Japanese knotweed	Volunteers	Foliar spray
2023	Japanese knotweed	Volunteers	Foliar spray
2024	Japanese knotweed	Project staff and volunteers	Foliar spray
2025	Japanese knotweed	Project staff	Foliar spray

4. Results

4.1 Invasive species abundance

Monitoring was carried out at two representative points within the site (referred to as points A and B in **Table 2**). When work began at Aberfeldy in 2020, Japanese knotweed was recorded as ‘abundant’ and ‘frequent’ using the DAFOR scale.

Following treatment work in 2020, Japanese knotweed abundance reduced to ‘rare’ at both monitoring points from 2021 onwards. In 2024 and 2025, Japanese knotweed was recorded as ‘not present’ at monitoring point B.

Annual control has continued to be necessary at this location due to small shoots of regrowth reappearing, indicating that the rhizome has not yet been completely compromised. There has also been evidence of plant fragments arriving on site from beaver activity upstream and establishing small areas of new growth.

The abundance of Japanese knotweed was measured using the DAFOR* scale and is shown in **Table 2** below.

Table 2 - Annual Japanese knotweed abundance from surveys (2020 – 2025) at Aberfeldy

Japanese knotweed abundance by year (DAFOR* scale)						
Monitoring point	2020	2021	2022	2023	2024	2025
A	A	R	R	R	R	R
B	F	R	R	R	N	N

* - **DAFOR Scale of abundance** – D = Dominant (50 – 100% cover), A = Abundant (30 – 50% cover), F = Frequent (15 – 30% cover), O = Occasional (5 – 15 % cover), R = Rare (<5% cover), N = Not Present

Figure 1a.

Summer 2020 – Prior to any treatment work. Knotweed is abundant on the riverbank.



Figure 1b.

Summer 2021 – After one year of treatment in 2020. Knotweed has been substantially reduced.



Figure 1c.

Summer 2025 – After five years of control, Japanese knotweed is now rare on site.



4.2 Chemical usage

Foliar spray application has been undertaken annually from 2020 through 2025 using a backpack sprayer and delivered at a concentration of 20ml per litre. Stem injection treatment was completed once in 2020 with 2ml of undiluted glyphosate delivered to larger stems, with smaller stems treated by foliar application.

A foliar adjuvant (Topfilm) was incorporated into the herbicide spray in 2024 and 2025 to make the treatment more effective on the small, waxy leaves and to help eradicate the final small stems of regrowth.

Chemical use showed steady decline from 2020 to 2023 but increased slightly in 2024 as new plant fragments had arrived on site from beaver grazing activity further upstream. This control appears to have been effective and the upstream sites with beaver grazing activity are now more in hand. Chemical use dropped back down in 2025. The site will now be checked/controlled biennially as regrowth is so minimal – unless further concerns about beaver activity and resultant new knotweed growth arise.

Table 3 (below) shows the total volume of glyphosate used in each control year.

Table 3 – Volume of glyphosate used to control Japanese knotweed at Aberfeldy

Glyphosate used per year (litres)						
Site Name	2020	2021	2022	2023	2024	2025
Aberfeldy	2.7	0.25	0.1	0.005	0.16	0.01

4.3 People effort

Control was undertaken by Scottish Invasive Species Initiative staff and local volunteers in 2020. Initiative staff completed the follow up control work in 2021, volunteers in 2022 and 2023, and a combination of both in 2024. As the knotweed becomes smaller and native vegetation bounces back, it often becomes harder to find regrowth which can lead to an increase in time spent on site. Time also increased slightly in 2024 because of work required to identify and control new areas of knotweed established due to beaver activities.

Table 4 (below) shows effort in terms of hours control work per year at the site.

Table 4 – People hours used to control Japanese knotweed at Aberfeldy

Hours of control work per year						
Site Name	2020	2021	2022	2023	2024	2025
Aberfeldy	21.5	2	1	2	2.5	1

5. Conclusions and Progress Made

The impact of the Japanese knotweed control work delivered at the Aberfeldy Town site between 2020 and 2025 is significant.

This is demonstrated by the change in abundance of the plant at the site (see **Table 2** and **Figures 1a, b & c**) which show a large reduction in the extent of Japanese knotweed observed and in the DAFOR abundance score recorded, which has reduced from ‘abundant’ to ‘rare’.

The effort needed to deliver control at the site also reduced significantly between 2020 and 2022 but increased slightly in 2023 and 2024, as regrowth became harder to find and beaver activity upstream caused complications for the general area. The same is the case for chemical use, which is now a fraction of what was required in 2020. Chemical volume and hours spent on control reduced by 99.6% and 95.3% respectively between 2020 and 2025.

To date, control delivered by Scottish Invasive Species Initiative staff and volunteers has significantly reduced the scale of the Japanese knotweed problem at Aberfeldy. This highlights the potential to make an impact on an emerging problem site if treatment is delivered relatively quickly after being identified.

It also shows that while in some cases knotweed can be completely eradicated from a site in as little as three years, in other cases it can prove more stubborn and requires consistent annual monitoring and control to prevent a comeback before eradication is achieved. External vectors can also bring new outbreaks of knotweed to an area already under management.

In 2021, members of the Upper Tay Paths Group gained pesticide application qualifications supported by the Scottish Invasive Species Initiative. This allowed members of this local volunteer group to take ownership of the monitoring and control required in future years, with project staff support where required.

6. Next Steps

The Japanese knotweed problem at Aberfeldy sits in the middle of a much wider infestation on the Upper Tay, particularly upstream of Aberfeldy all the way into Loch Tay. Works are ongoing to identify and control these areas, but progress is slow due to complex terrain and beaver activity. As these works continue, it will be vital for local volunteers and the project team to continue monitoring the Aberfeldy area to ensure the site is not reinfested from upstream sources and the final remaining regrowth is entirely removed. The site will be moved to a biennial control/monitoring program in 2026.

Further information

Contact: sisi@nature.scot

Website: www.invasivespecies.scot