

**SCOTTISH
NATURAL
HERITAGE**



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Commissioned Report No. 223

**Survey of Giant Hogweed,
Japanese Knotweed and Himalayan
Balsam on five major Lothian rivers**

(ROAME No. F02LJ01)

For further information on this report please contact:

Ewan Campbell
Scottish Natural Heritage
Laundry House, Dalkeith Country Park
DALKEITH
Midlothian
EH22 2NA
Telephone: 0131-654 2466
E-mail: ewan.campbell@snh.gov.uk

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Background

Of several thousand alien plant species occurring throughout the British Isles, only a small proportion are aggressively invasive. Invasive non-native plants are a great threat to natural botanical diversity by out-competing native species and forming dense stands through suitable habitats. These mono-dominant stands themselves support little wildlife and greatly reduce the overall biodiversity of areas they invade. Rivers, which are also important corridors for wildlife, provide an easy means for the most invasive of these species to spread by seed or vegetatively depending on their individual means of reproduction. Three of the most invasive of these species are *Impatiens glandulifera*, *Fallopia japonica* and *Heracleum mantegazzianum*.

Main finding

Over the five Lothian rivers surveyed:

- *Fallopia japonica* (Japanese Knotweed) was by far the most extensive of the three species, often forming semi-continuous stands along riverbanks which were frequently, on the North and South Esks in particular, within important habitats such as native riparian woodland. The location of populations are hard to predict with frequent isolated stands being found where garden refuse has been dumped or disturbance to the bank has occurred for example. In general the plant occurs much more extensively in and around built-up areas and is much rarer in the more rural locations of the river systems' upper reaches.
- *Heracleum mantegazzianum* (Giant Hogweed) was the least widespread species which occurred only on the lower Esk in any profusion. Elsewhere it occurred as isolated small stands with at least one record on each catchment. Incidental sightings of this species were also made from the A1 where there are more extensive populations locally.
- *Impatiens glandulifera* (Himalayan Balsam) shows a quite distinct pattern of distribution with well-defined upstream and downstream limits between which it occurs at near constant or very high frequency. On the rivers where it occurs the downstream limit is always the sea or a little inland where there is tidal influence as on the River Tyne. On some rivers there are small populations, which occur upstream of the main length of affected river and these populations should be treated as priority in order to stop colonisation of "free" stretches between them and the main population downstream. It is also important that searches are carried out in subsequent years after removal due to it being an annual.

For further information on this project contact:

**Ewan Campbell, Scottish Natural Heritage, Laundry House, Dalkeith Country Park, Dalkeith
Midlothian EH22 2NA Tel: 0131-654 2466**

For further information on the SNH Research & Technical Support Programme contact:

Policy and Advice Directorate Support Unit, Scottish Natural Heritage, Great Glen House, Leachkin Road, Inverness IV3 8NW
Tel: 01463 725000 or ascg@snh.gov.uk

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1 SPECIES STATUS/BACKGROUND

1.1 *Impatiens glandulifera* (Himalayan/Indian Balsam/Policeman's Helmet)

Native to the western Himalayas, *Impatiens glandulifera* is an invasive garden escape, first introduced to Britain as an ornamental garden plant in the 1830's and recorded in the wild in the middle of the 19th century. As an annual it only has the capability to spread by seed through 'explosive' dispersal of large quantities of seed (approx. 800/plant). As the tallest annual in Britain *Impatiens glandulifera* often shades out other species in tall, dense stands leading to reduced botanical diversity of its preferred habitats. The commonest habitat, where it spreads most rapidly downstream, presumably through water, tends to be river banks where it often forms dense linear stands which dominate native bank vegetation. It is however also found through damp woodlands, where it is moderately shade-tolerant, and through flushes. A certain level of soil moisture is necessary for its success and plants surviving in drier habitats tend to be reduced in stature and vigour. *Impatiens glandulifera* is currently still increasing through suitable habitats in Britain with only limited control or eradication projects.

1.2 *Fallopia japonica* (Japanese Knotweed)

A native of eastern Asia, *Fallopia japonica* was introduced from Japan as a garden ornamental in 1825. By 1886 it was recorded as a naturalised alien, becoming established by 1940 and greatly increasing since 1962. Regeneration is vegetative by means of extensive rhizome systems, which occurs naturally adjacent to rivers, becoming more reliant on human interaction elsewhere (ie in movement of contaminated soil or disturbance of roots). Viable seeds are not produced in the UK. *Fallopia japonica* forms a dense canopy early in the growing season which is 2–3m high, beneath which few species are able to survive. Stem litter build up is also a problem further preventing growth of our native species. It is found predominantly around urban areas, along river banks, railways and road verges as well as waste ground, spoil heaps and sea-loch shores and able to grow in all soil types. Rhizome fragments can be dispersed through disposal of garden refuse and other rubbish as well as through water and in particular by river floods. The young shoots of *F. japonica* are used as a vegetable in Japan. In Britain it is used as cattle fodder locally in Wales (although thought to be toxic to some species of livestock) and is becoming increasingly popular as a vegetable (shoots can be made into pies and leaves are cooked like spinach).

1.3 *Heracleum mantegazzianum* (Giant Hogweed)

Heracleum mantegazzianum has been present in Britain for over 150 years, having first been introduced by the Victorians from the Caucasus mountains as an ornamental garden plant. It grows to 5m high with leaves as large as 1.5m taking up to 4 years to flower and reach this height. Due to the large size of its leaves, rapid growth and density of established stands, *H. mantegazzianum* is able to shade out native flora along river banks which in turn causes increased bank erosion, when leaves die back in the winter leaving areas of extensive bare ground. Up to 5,000 seeds are produced from each plant (approx. 1,500 from each flower head) and can remain dormant in the soil for many years. As it often grows adjacent to rivers these seeds can be transported great distances.

Sap in the stem of *H. mantegazzianum* causes severe blistering of the skin when subjected to direct sunlight. Due to these health concerns eradication projects are often high priority, particularly through areas of increased public access.

2 OBJECTIVE

The survey was carried out to assess the distribution and abundance of these three key species through five main Lothian rivers to determine the severity of their aggressive invasion.

3 METHOD

Initial field survey was undertaken in September/October 2003 with walked surveys carried out over rivers and their main tributaries. Shortly after the first frost in October, and subsequent leaf/flower loss by key species, field work was halted in order to eliminate error in locating species which were harder to see. The survey was resumed and completed in June/July 2004. Prior to survey access permission was sought from adjacent farms where possible. Where access was restricted either topographically or due to private gardens these sections were noted or viewed using binoculars. Some lengths of river were not seen for various reasons, most commonly steep or dense woodland and private housing and grounds. Where this happened grid references of the limits of these were recorded. Some sections were, for similar reasons, only seen intermittently and again the reason recorded.

All upstream limits of survey were also noted on main rivers and tributaries. Where there were many occurrences of stands of plants an upstream and downstream grid reference was noted for the limits and a density rating given, eg where Himalayan Balsam occurs it is generally constant over long sections of river with an upstream limit and then nothing beyond that. Where stands occur as isolated patches on lengths of river with banks generally free of aliens then a point location was noted, eg Japanese Knotweed, unlike Himalayan Balsam, tends to grow in well-defined stands of varying size.

A variety of other alien (sometimes invasive) species, although not specifically searched for, were noted during the course of the survey.

A handheld GPS unit was used to increase accuracy in obtaining location grid references for stands. However it was not always possible to take a reading due to trees blocking a clear view of the sky.

Field survey was carried out by Tim Rafferty and Kate Proctor.

4 DATA INPUT

Data was entered into an excel spreadsheet (from field recording forms – Appendix 3) in a suitable format for GIS capture for each of the main river catchments. Each species was given a different numerical ID:

- 1 *Impatiens glandulifera* (Himalayan Balsam);
- 2 *Fallopia japonica* (Japanese Knotweed);
- 3 *Heracleum mantegazzianum* (Giant Hogweed) and entered using common names.

The broad Phase 1 habitat type associated with each stand was also entered as in Table 4.1. Where no suitable habitat type existed in the standard Phase 1 methodology new codes were added (ie vegetated shingle 'SH'). If more than one habitat type was encountered then these were all entered (ie SS/TR).

Table 4.1 Lettered codes for Phase 1 habitat types

Woodland and scrub	
BW	Semi-natural broadleaved woodland
PBW	Plantation broadleaved woodland
PCW	Plantation coniferous woodland
PMW	Plantation mixed woodland
SS	Scattered scrub
SBW	Scattered broadleaved trees
DS	Dense scrub
Grassland and marsh	
SAG	Semi-improved acid grassland
SNG	Semi-improved neutral grassland
I	Improved grassland
MG	Marsh/marshy grassland
Tall herb and fern	
SB	Scattered bracken
TR	Tall ruderal
NR	Non-ruderal
Swamp, marginal and inundation	
SP	Swamp
MV	Marginal vegetation
SH	Vegetated shingle
Miscellaneous	
A	Arable
AM	Amenity grassland
ESP	Ephemeral/short perennial
IS	Introduced shrub
EB	Earth bank
BG	Bare ground
VE	Verge
H	Housing

Surveyors initials (KP/TR) and the date of survey are also included. Where discrete stands of plants were encountered these were recorded, where possible, as point data with the NGR as a 6-figure Easting and 6-figure Northing in separate columns. An assessment of the density of the stand was made as a record of individual plants and stand size (see Table 4.2 below).

Photographs were taken of representative stands throughout the survey area and are referenced in the file notes column of the data tables along with target note references. Photographs are supplied on CD and as prints.

Table 4.2 Population and stand size ratings for point data

Rating	No. of individuals
1	1-10
2	11-30
3	31-50
4	51-100
5	≥100
Rating	Size of stand
1	1-10m ²
2	11-30m ²
3	31-50m ²
4	51-100m ²
5	≥100m ²

Where longer sections of river exhibited similar densities an upstream and downstream grid reference was noted and a descriptive assessment of the relative densities of each species noted. These descriptive assessments were then allocated a rating for ease of data input (Table 4.3). Each of the three species was given a separate rating due to their differing growth habits.

Table 4.3 Density ratings for section data

Rating	Density description
<i>Impatiens glandulifera</i> (Himalayan Balsam)	
1	Very sparse or infrequent
2	Occasional small stands/frequent sparse
3	Constant sparse/frequent medium stands
4	Frequent dense stands
5	Continuous/dense
<i>Fallopia japonica</i> (Japanese Knotweed)	
1	Rare/occasional small stands
2	Frequent small/occasional medium stands
3	Frequent medium stands
4	Semi-continuous/very frequent large population
5	Continuous dense stand
<i>Heracleum mantegazzianum</i> (Giant Hogweed)	
1	Rare individuals/small stands
2	Occasional/sparse stands
3	Scattered but frequent small stands
4	Frequent large dense stands
5	Continuous and dense

5 RESULTS – DISTRIBUTION OF ALIENS THROUGH LOTHIAN RIVERS

5.1 River Almond and tributaries

The River Almond and tributaries were surveyed from Whitburn and Greenburn in the west to the Firth of Forth at Cramond. Of the five river catchments surveyed the Almond passes through the most urban areas. This in turn makes access frequently restricted. Outwith these built-up areas the adjacent land-use is primarily lowland agricultural.

5.1.1 *Impatiens glandulifera* – Himalayan Balsam

Impatiens glandulifera occurs through the lower reaches of the river from just inland at Cramond upstream to the Newbridge Industrial Estate. The plant occurs as a virtually constant feature along both banks and tends to grow amongst other tall herbs and does not generally form large dense stands on its own. It also occurs sparsely along a short section of the Niddry Burn tributary at Newbridge itself.

Above Newbridge Industrial Estate it was not recorded on the main river except once at Mid Calder where it occurs as just a few sparse plants over approx. 30m of bank. Clearly, this small population will expand and its seed will already be getting swept downstream. This should be treated as an immediate priority in the event of an eradication programme as it would be easy to control now in such small amounts but a much greater problem if left much longer. A re-survey of the river from Mid Calder to Newbridge Industrial Estate should also be carried out to ascertain how much seed has already been able to colonise from these plants and any occurrences dealt with accordingly.

On the Beugh Burn (south Broxburn to Newbridge) there are infrequent small stands between Burnside (NT 094721) and Newbridge (NT 117731) on arable margins and within riparian woodland. The Brox Burn within the town of Broxburn also supports small stands.

5.1.2 *Fallopia japonica* – Japanese Knotweed

Japanese Knotweed occurs consistently along the whole river from Cramond upstream to Livingston and beyond. The concentration of stands varies from occasional small and medium stands to virtually continuous or frequent long stands, eg Hallyards by Kirkliston. The plant increases in frequency and stand size around the built-up area of Livingston and at Almondell and Calderwood Country Park just downstream of the town. Upstream, beyond the outskirts of Livingston, it tends to become much more occasional or rare, being seemingly completely absent from some farmland tributaries, eg Bog Burn.

5.1.3 *Heracleum mantegazzianum* – Giant Hogweed

Giant Hogweed was recorded at only one location on the river (NS 13895 73816) where it grows as a small patch of less than 10 plants. This should therefore be treated as priority to stop the spread of the plant.

5.1.4 Other aliens

Rumex pseudoalpinus (Monk's Rhubarb) was recorded from only one location through the course of the survey at NS 96886 61718 where the Woodmuir Burn joins the Breich Water. Despite being an alien the status of this species within the British Isles is a little uncertain. An archaeophyte dating back from medieval

times, *R. pseudoalpinus* is now significantly declining throughout Britain but remains locally common in Western Scotland. It is also listed on the JNCC web-site as nationally scarce although without IUCN protection status. Due to its non-invasive nature and uncertain status, eradication of this species is deemed unnecessary/inappropriate.

Symphoricarpos albus (Snowberry) is a common plant throughout the river system but tends to be concentrated around the more built-up urban areas, eg the riverside amenity walks around Livingston, and housing.

Rhododendron ponticum (Rhododendron) occurs as a feature of amenity woodland/parkland and some larger houses. It was noted at high levels in the public riverside grounds at Cramond and Almondell Country Park.

5.2 River Esk

The River Esk was surveyed from its 'source', at the confluence of the North and South Esks, to the sea at Musselburgh. Upstream there is frequent mixed (plantation) woodland adjacent to the river as well as farmland, with the landscape becoming increasingly built up downstream. Despite increased urbanisation access to the river is generally good throughout. No additional tributaries were surveyed over this stretch.

5.2.1 *Impatiens glandulifera* – Himalayan Balsam

Impatiens glandulifera occurs throughout the whole of the lower Esk. At Musselburgh town centre it occurs occasionally on islands in the river but, inland, soon builds up in frequency and concentration so that upstream of the A6095 road bridge it becomes a constant feature on both banks. It is found both as large mono-dominant stands and growing through other tall herb vegetation, sometimes at a considerable distance (50m or more) from the river bank. Along with Giant Hogweed and Japanese Knotweed this is probably the worst area of the current survey for this species, the banks through Monktonhall golf course being particularly affected. Upstream of the golf course it occurs at somewhat lower levels though it remains a constant feature up to the confluence of the North and South Esks and beyond.

5.2.2 *Fallopia japonica* – Japanese Knotweed

Fallopia japonica occurs as frequent medium and large stands, at times semi-continuous over long sections of bank from just inland at Musselburgh upstream. It is particularly concentrated from here up to just beyond Monktonhall Golf course, upstream of which it occurs somewhat less profusely up to Smeaton. Between Smeaton and the confluence of the North and South Esks it is generally less frequent.

5.2.3 *Heracleum mantegazzianum* – Giant Hogweed

Heracleum mantegazzianum occurs through the whole lower Esk. There are particularly large and dense stands around the area of Monktonhall golf course where it can occur some considerable distance from the river, to 100m or more. Above the golf course it remains a consistent feature of both banks although less frequently and of much smaller stands up to the confluence of the North and South Esks and beyond. See sections 5.3.3 and 5.4.3.

5.2.4 Other aliens

No other alien species were noted over this watercourse.

5.3 River North Esk and tributaries

The North Esk was surveyed from an upstream limit 1 mile north of Carlops (NT 1556) to its confluence, downstream, with the South Esk at the northern edge of the Dalkeith Country Park (NT 3369). In addition several of the main tributaries to this river were surveyed including Park Burn (NT 3268), Black Burn (NT 2358), Nine Mile Burn (NT 1757) and Harlawmuir Burn (NT 1754). In its upper reaches the watercourse is of an upland nature with a varied structure of exposed rocks and shingle, with corresponding diverse flow patterns. Immediately adjacent land is predominantly open pasture with occasional mixed plantations and scrub. Downstream, where the river is not passing through urban environments, it is frequently associated with broad-leaved gorge woodland, which is often of the richer *Fraxinus excelsior-Ulmus glabra* communities. Due to the inaccessible nature of some of these habitats all sections of the channel and associated banks were not always clearly seen.

5.3.1 *Impatiens glandulifera* – Himalayan Balsam

The plant occurs frequently along both banks of the North Esk, sometimes growing very sparsely amongst other tall herbs, at other times as mono-dominant stands of small or medium size. There is an initial upstream limit to these frequent stands at Hawthornden Castle grounds. However, further upstream there are also smaller populations at Nine Mile Burn. These plants exist at the margins of private gardens and wet woodland (NT 17953 57649 and NT 17975 57610). The furthest upstream record consists of only two plants with a denser stand occurring immediately downstream. Downstream of these 'source' plants there are scattered individuals and small stands which become less frequent, smaller, and sparser downstream until the lowest of these upstream 'population' NT 22732 59307.

Stands downstream of Hawthornden Castle (NT 2863) are generally small and infrequent, becoming more frequent for a stretch around Lasswade (NT 3066).

Between the join of two tracks within Dalkeith Country Park a small stand was noted, where garden refuse has been dumped, growing in amongst *Tussilago farfara*, *Cirsium arvense* and *Rumex obtusifolius* on a mound of spoil. This was an incidental sighting as any areas away from watercourses were not systematically searched.

5.3.2 *Fallopia japonica* – Japanese Knotweed

The plant occurs throughout the river system in varying amounts with its upstream limit immediately upstream of the A701 road-bridge (NT 23596 59576), south of Penicuik town centre. However, a short length of channel immediately upstream of here was not clearly seen due to limited urban access. Downstream of here stands are frequent and of moderate size. In the more downstream reaches of this river stands typically become even more frequent and larger. These stands are usually associated with broad-leaved riparian woodland which tends to be semi-continuous over the course of the river. *Fallopia japonica* was generally encountered more frequently than either *Heracleum mantegazzianum* or *Impatiens glandulifera*. None of the main tributaries surveyed had any occurrences of *Fallopia japonica*.

5.3.3 *Heracleum mantegazzianum* – Giant Hogweed

The distribution of *Heracleum mantegazzianum* on the North Esk is restricted to its very lower reaches upstream of its confluence with the South Esk. The upstream limit appears to be within the Dalkeith Country

Park on a minor tributary (Park Burn) which joins the main channel at NT 33400 68886. The furthest upstream record on this tributary is at NT 33334 68895 where only one (flowering) plant exists. The stand at the confluence itself has not flowered this season, probably indicating plants under 4 years old. All plants occur within broad-leaved (plantation) woodland within the Dalkeith Country Park.

5.3.4 Other aliens

Mimulus guttatus agg. (Monkey Flower) occurs frequently through appropriate habitats particular in the more diverse sections of channel in the river's upper reaches. Here it occurs through the river's margins on exposed shingle or around protruding rocks where the water is generally shallower and faster flowing. It was noted particularly frequently downstream of Carlops although there were no further sightings upstream of Carlops.

Symphoricarpos albus (Snowberry) tends to be concentrated around built-up environments and was particularly noted around Mavisbank House (NT 2965), Dalkeith and along riverside walkways in Penicuik where it becomes quite extensive locally.

Rhododendron ponticum (Rhododendron) within the North Esk catchment is mainly found through the grounds of Penicuik House where it forms quite dense stands locally and usually through mixed plantation/broad-leaved woodland. Elsewhere, less extensive stands occur around Penicuik and Roslin.

5.4 River South Esk and tributaries

The South Esk was surveyed from Rosebery Reservoir (NT 3056) upstream to its confluence with the North Esk at the northern edge of the Dalkeith Country Park (NT 3369). Tributaries surveyed include Dalhousie Burn (NT 3163), Redside Burn (NT 3058), Gore Water (NT 3759 to NT 3361), Middleton North (NT 3558) and South Burns (NT 3657), Purvies Hill Burn (NT 3258), Castleton Burn (NT 3358), Bleakley Burn (NT 3756) and various others without names on the Ordnance Survey map. For the majority of its length the river, and its tributaries, are buffered by mainly broad-leaved, mature riparian woodland. Where this woodland becomes very steep, particularly in the middle to upper reaches access becomes frequently restricted by the topography and associated vegetation. In the upper reaches of some of the main tributaries in the south, adjacent land is mainly enclosed pasture. The watercourses themselves have greatly varied structure and flow patterns, which are similar to those of the North Esk.

5.4.1 *Impatiens glandulifera* – Himalayan Balsam

Impatiens glandulifera is quite limited in its distribution through the South Esk catchment area. All stands occur within the Dalkeith Country Park downstream of Dalkeith town centre. Only six individual stands were noted, the majority of which are small (<10m²) and with few individual plants growing in amongst tall herbs and associated vegetation. Only one large stand (>100m²) occurs at the confluence of the North and South Esk (NT 339691) with scattered bracken in broad-leaved woodland.

5.4.2 *Fallopia japonica* – Japanese Knotweed

Stands of *F. japonica* occur throughout the majority of the river system with even a small stand being noted as far upstream as NT 33142 58334 close to Castleton Burn on a roadside verge. Despite this stand and a further two adjacent to the B6372 downstream on this tributary, the main South Esk river has no stands of

this vegetation upstream of Dalhousie Castle (NT 323635). Between here and Lothian Bridge no alien species were noted either.

A short stretch of the Gore Water between Shank Bridge (NT 337614) and its confluence with the main South Esk downstream also provides a locus for this invasive vegetation in the form of two large stands and several smaller ones within this area of broad-leaved woodland.

Through the Dalkeith Country Park this species is the least widespread of the three, with only one large stand occurring at NT 338680 with tall ruderals and introduced shrubs and a very small stand (1–10 individuals) at NT 339683 on river shingle.

5.4.3 *Heracleum mantegazzianum* – Giant Hogweed

Once again, as on the North Esk, *H. mantegazzianum* is only found on the lower reaches through Dalkeith Country Park. Several mainly small stands were noted and distribution here is generally greater than on the North Esk. This higher population is likely to be a reflection on the greater availability of suitable habitat for colonisation by new stands (ie shingle side-bars and the margins of broad-leaved woodland).

5.4.4 Other aliens

Mimulus guttatus (Monkey Flower) is an occasional plant through the river margins of the Gore Water between Borthwick and Gorebridge where the channel is fairly shallow with suitable rocky substrate for this species.

Symphoricarpos albus (Snowberry) is an occasional plant throughout the river system tending to be concentrated around built-up areas around Dalkeith and Gorebridge. Upstream it is also frequent around North Middleton and Borthwick in gardens and along the river-banks.

Rhododendron ponticum (Rhododendron) occurs occasionally and usually through the grounds of large country houses such as Arniston (NT 3259), around Edgelaw Reservoir (NT 3058) and through Dalkeith Country Park (NT 3368).

Prunus laurocerasus (Cherry Laurel) occurs occasionally as quite dense stands and was particularly noted around the small village of Temple within mixed planted woodland.

5.5 River Tyne and tributaries

The River Tyne was surveyed from the upper reaches of the Tyne Water (NT 3959) to the North Sea at Tyne Sands, John Muir Country Park, Dunbar (NT 6279). A network of tributaries to the south of Haddington and Pencaitland were also surveyed and include Humber Water, Salters Burn, Fala Dam Burn, Linn Dean Water, Birns Water, Gifford Water, Colstoun Water and Newhall Burn. In the upper reaches of the catchment the watercourses tend to be small burns with a varied structure in accordance with local topography. Correspondingly the flow types are also greatly varied. As the river approaches its downstream reaches the mainly gravel and rocky substrates are replaced by increasing mud with steep banks characteristic of lowland watercourses. Bankside habitats in these western areas tend to be mainly arable with frequent small woodlands, both semi-natural and plantation.

5.5.1 *Impatiens glandulifera* – Himalayan Balsam

The lower reaches of the River Tyne downstream of East Linton have extensive populations of *I. glandulifera* growing as narrow, linear stands along the river banks. For the last 2km or so of this watercourse these stands are absent, presumably due to tidal influence and a possible intolerance by *I. glandulifera* to increased salinity. A little upstream of where the A1 crosses the river at East Linton a moderate stand marks the apparent upstream limit of this species with populations and stand size gradually increasing downstream of here. Habitats in which this species was recorded were quite limited and restricted to tall ruderal, scattered bank-top trees and broad-leaved semi-natural woodland.

However, immediately downstream of the confluence of the Gifford Water and the Newhall Burn (NT 525600) a single plant was recorded on the left bank. All flowers and seeds were removed from this plant at the time of survey (16/10/03) although due to the lateness of the season it is likely that many seeds had already been released. Upstream explorations of both of these watercourses revealed no further plants indicating that further survey needed to be undertaken in this area to determine the location of any possible source population. One possible source area is the more formal grounds of Yester House upstream of Gifford which were not accessed for the full length of the watercourse due to their private nature. It was intended that this area would be surveyed in 2005 once necessary access permissions had been gained. A letter was sent to the owner and to date no response has been received. Several small tributaries in this area were surveyed in 2005 and no further plants recorded. It is therefore quite likely that the source population is within the grounds of Yester House.

5.5.2 *Fallopia japonica* – Japanese Knotweed

Of the 3 species, *Fallopia japonica* has the most widespread distribution through the River Tyne catchment, occurring frequently as small to moderately sized stands along the banks and occasionally a short distance from the river in suitable habitats. It tends to be much less frequent on the upper reaches and sometimes, eg the upper Tyne Water and the Humber Water upstream of the Keith Water confluence, completely absent. Unusually no stands were found in the very lower reaches of this river downstream of East Linton, where it is frequent. The upstream limits of this species appear to be at Gifford (NT 532678) and Fala Dam (NT 429615) with nearby records on roadside verge at Haugh Head House. As is typical *Fallopia japonica* occurs in a variety of habitats along the course of the river although predominantly through riparian woodland which is semi-continuous over parts of the river particularly in its upper reaches. The frequency of invasion with these habitat types is more likely a reflection of their abundance rather than any preference by *F. japonica*.

5.5.3 *Heracleum mantegazzianum* – Giant Hogweed

Through the whole of the length of this river and its tributaries (surveyed to date) only one smallish stand of *Heracleum mantegazzianum* was found, where arable fields buffer the river bank in its slower flowing lower reaches (NT 60989 78219). Therefore, this stand should be treated as priority to prevent its spread.

However an extensive stand was noted where the main A1 crosses the river along the embankment. This population was only noted from a moving vehicle.

5.5.4 Other aliens

Mimulus guttatus agg. (Monkey Flower) occurs frequently through appropriate habitats particularly in the more diverse sections of channel in the river's upper reaches. Here it occurs through the river's margins on exposed shingle or around protruding rocks where the water is generally shallower and faster flowing. This species was not noted downstream of East Linton.

Symphoricarpos albus (Snowberry) occurs occasionally through the river system. It was recorded in particularly frequent and large patches in the riverside public woodland at Pencaitland (44323 68929).

Rhododendron ponticum (Rhododendron) occurs occasionally usually in the grounds of large country houses such as Saltoun Hall (46090 68673), Johnstounburn Hotel (46000 61700) and Oxonfoord Castle (39114 65456).

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Appendix 1 Target notes

- 1 Dense stand becoming more scattered upstream for further 20 x 3m and also 100+ individuals. [KP/North Esk]
- 2 Dense stand with scattered outliers. [KP/North Esk]
- 3 Frequent scattered small and moderate stands with dense concentration of stems. Woodland on LB more inaccessible. Stands between 2 x 4m and 15 x 5m (>100m² total over section) and approx. 12–15 such stands. [KP/North Esk]
- 4 Mainly dense stands overhanging the river. [KP/North Esk]
- 5 Main stand occurs adjacent to the river with a smaller stand 30–40m back from right bank. 50m upstream there is another stand 15m² and 51–100 individuals – no GPS signal. [KP/North Esk]
- 6 Frequent dense stands on both banks. [KP/North Esk]
- 7 Immediate river terrain difficult in terms of accessibility (very steep) and limited GPS signal. There may be another smaller stand between here and bridge downstream. Upstream of this record there are frequent semi-continuous dense stands of Japanese Knotweed for approx. 60 x 3m and then becoming more scattered and less frequent. Visibility of immediate river bank is poor as GPS signal absent. [KP/North Esk]
- 8 Semi-continuous dense stand 50 x 2m overhanging channel and dominating bank between path and river. [KP/North Esk]
- 9 Moderately dense stand in parts and approx. 150m² becoming sparser upstream. [KP/North Esk]
- 10 Grid reference taken from bridge. Downstream dense stands occur on both banks: left bank 80m²/right bank 15m². Upstream only occurring on left banks 25m² dense stand. [KP/North Esk]
- 11 One further Himalayan Balsam plant was found between here and previous record. No GPS signal due to trees. [KP/North Esk]
- 12 Away from river and between the join of two tracks where organic/garden refuse has been dumped. [KP/North Esk]
- 13 Plants occur 100m downstream of GPS reading. [KP/South Esk]
- 14 No GPS signal at this point. 20m upstream of weak signal used for previous record. [KP/South Esk]
- 15 Weak GPS signal. Accuracy unknown. [KP/South Esk]
- 16 Extensive dense stand of Japanese Knotweed at edge of planted trees which is approx. 50 x 7m in size. [KP/Almond]
- 17 Plants occurring as four separate stands. [KP/Almond]
- 18 Four small stands of Japanese Knotweed. [KP/Almond]
- 19 Very large, dense stand (approx. 10 x 40m) spreading away from the river over floodplain at edge of broadleaved woodland. [KP/Almond]

- 20 Part of this stand of Japanese Knotweed has been cleared. [KP/Almond]
- 21 Three individual stands of Japanese Knotweed which have been partially cleared/browsed? [KP/Almond]
- 22 Population of Japanese Knotweed is quite sparse due to browsing by cattle? [KP/Almond]
- 23 Bank between railway and road which is densely vegetated by Japanese Knotweed. Stand is probably about 200m² with 10 stems/m². Stand was only seen from the road with adjacent land inaccessible gardens etc. [KP/Almond]
- 24 Section of data from roadside verges (B792) rather than riverine habitat. [KP/Almond]
- 25 Extent of population not clearly seen, but dense and established on left bank and sparser/smaller stands on right bank. [KP/Almond]
- 26 Stand is approximately 150m² with a density of 10/m² although not clearly seen. [KP/Almond]
- 27 Stand of Japanese Knotweed at edge of planted Poplars and Sycamore which is about 100m² with the usual density of 10/m². 100m downstream there is another dense stand (30m²) on the right bank where there is no GPS signal. [KP/Almond]
- 28 Dense stand of Snowberry adjacent to minor tributary which spreads up this channel and along cycleway/disused railway. Stands vary between quite sparse to denser thickets. GPS reading may not be accurate due to tree canopy. This tributary was not followed upstream due to dense impenetrable vegetation. [KP/North Esk]
- 29 Several stands Japanese Knotweed average size 8 x 2m. [TR/North Esk]
- 30 Himalayan Balsam is sparsely frequent along the river downstream from here but fades out upstream of here, a steep wooded valley at Hawthornden Castle. The plant has invaded the woodland up to 30m from the channel. [TR/North Esk]
- 31 Frequent stands of Japanese Knotweed to 8 x 4m. [TR/North Esk]
- 32 Rhododendron is very frequent, dense and a problem throughout the woods at Hawthornden castle. [TR/North Esk]
- 33 Monkey Flower present on river bed gravels. No 8 figure GPS reading was available due to dense woodland cover. [TR/North Esk]
- 34 Scattered small patches (1 x 1m) of Japanese Knotweed along banks here. [TR/North Esk]
- 35 A small tributary opposite factory with Japanese Knotweed patch 10 x 3m. [TR/North Esk]
- 36 Monkey Flower frequent in small stands on river bed gravel. To 4 x 2m. [TR/North Esk]
- 37 Densely wooded glen. Monkey Flower rarer here but still present on rare small patches. [TR/North Esk]
- 38 Monkey Flower is particularly common along this stretch, sometimes patches reaching 10 x 4m. Not seen again above Carlops. No other aliens seen on uppermost reaches of the North Esk. [TR/North Esk]

- 39 Frequent small river bed patch of Monkey Flower along length of Black Burn. No other aliens seen. [TR/North Esk]
- 40 Giant Hogweed present as scattered small patches and individuals. [TR/Esk]
- 41 Himalayan Balsam is constant along both banks growing through other tall herbs and frequently forming dense stands upstream to above the golf course where it starts to thin a bit but still remains pretty constant. [TR/Esk]
- 42 Japanese Knotweed here becomes a constant feature forming very frequent long stands which at times are almost continuous. [TR/Esk]
- 43 From here upstream Giant Hogweed forms some very large stands which in places can be seen 100m or so away from the banks. It is fairly constant along with the other two aliens up to the upstream end of the golf course where they start to become somewhat less dominant. [TR/Esk]
- 44 Giant Hogweed is absent above Dalkeith Country Park. It is not possible to say exactly where the last plant occurs as the whole of the river was not fully seen due to the steep, inaccessible nature of some of the banks. Japanese Knotweed is still fairly frequent in small to medium patches and Himalayan Balsam is a fairly constant feature although growing very sparsely generally amongst other tall herb vegetation. [TR/North Esk]
- 45 Dense woodland and very private big houses and land – river seen intermittently up to Lasswade. Himalayan Balsam (generally sparse but thickening up at times) and Japanese Knotweed (small to medium stands) are both still fairly frequent. [TR/North Esk]
- 46 Japanese Knotweed in grounds of Dalhousie Castle. Rhododendron abundant here. No aliens were seen downstream of here to Lothian Bridge (332672/664678). [TR/South Esk]
- 47 Abundant big patches of Snowberry in the public woodland here. Japanese Knotweed is also frequent in medium to large patches. Rhododendron also frequent. [TR/Tyne]
- 48 Japanese Knotweed occurs rather sparsely over 30m on both banks. [TR/Tyne]
- 49 Occasional Snowberry present through woods. [TR/Tyne]
- 50 Several patches of Japanese Knotweed present over 50m of bank at Haddington. [TR/Tyne]
- 51 Scattered Japanese Knotweed have colonised a fairly new flood bank over approx. 30m. [TR/Tyne]
- 52 Rhododendron a problem throughout Saltoun Woods. [TR/Tyne]
- 53 Himalayan Balsam is present from Cramond (approx. 500m inland) upstream to Newbridge Industrial Estate. It is quite a constant feature of both banks and generally tends to grow amongst other tall herbs and not forming dense stands on its own. Beyond the upstream limit it was seen only as a sparse few plants at Mid Calder so it may well soon establish itself down to Newbridge if not dealt with. [TR/Almond]
- 54 Japanese Knotweed forms several stands up to 20m long in this area. [TR/Almond]
- 55 Japanese Knotweed becomes much more frequent along this section forming some very long dense stands (see P32). [TR/Almond]

- 56 Japanese Knotweed forms almost continuous dense stands along the banks by Hallyards. [TR/Almond]
- 57 Japanese Knotweed is present in frequent medium to large stands right through Livingstone. The habitat is largely riverside amenity grassland with scrub and planted broadleaves. Along the banks is mainly tall herbs and ruderals with scattered or patchy dense scrub. [TR/Almond]
- 58 Himalayan Balsam, not seen since Newbridge Industrial Estate downstream, is present here as just a few sparse plants over about 30m of bank. It was not seen again upstream of here. These should be dealt with a.s.a.p. to stop downstream spread. [TR/Almond]
- 59 Japanese Knotweed present on tributary up to 20m from main river. Otherwise not seen upstream on this tributary. [TR/Almond]
- 60 Giant Hogweed present as less than 10 individuals. This was the only sighting of this plant on the Almond. [TR/Almond]
- 61 Some small sections not seen here due to flowing through private houses/gardens. [TR/Almond]
- 62 *Rhododendron ponticum* is frequent through majority of Yester House grounds that were seen. [KP/Tyne]
- 63 Upstream there are a few more stems of Japanese Knotweed on the right bank. [KP/Tyne]
- 64 Large stand of Japanese Knotweed (approx. 150m² with a density >10/m²) which appears to have been browsed by cattle over the fence. [KP/Tyne]
- 65 Giant Hogweed is in amongst other garden escapes on this roadside verge and has probably been dumped in amongst garden refuse. [KP/Tyne]
- 66 There is also possibly a further small stand of Japanese Knotweed upstream between track and road. This stand was only seen using binoculars. [KP/Tyne]

Appendix 2 Data tables

River North Esk

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	TR	KP	15/09/03	325166	661726	5	4						Print 13
2	Japanese Knotweed	BW	KP	15/09/03	325099	661812	4	2						Print 14
2	Japanese Knotweed	BW	KP	15/09/03	325084	661810	4	1						Print 15
2	Japanese Knotweed	BW	KP	15/09/03	325019	661808	5	5						Print 15
2	Japanese Knotweed	BW	KP	15/09/03	324984	661804	5	4						TN1
2	Japanese Knotweed	BW	KP	15/09/03	324949	661809	5	5						TN2
2	Japanese Knotweed	BW	KP	15/09/03	324865	661752	3	4						
2	Japanese Knotweed	BW	KP	15/09/03	324849	661715	5	5						
2	Japanese Knotweed	BW	KP	15/09/03	324832	661669	2	2						
2	Japanese Knotweed	BW/SNG	KP	15/09/03					324712	661384	324800	661637	3	TN3
2	Japanese Knotweed	BW	KP	15/09/03	324744	661351	5	3						
2	Japanese Knotweed	BW	KP	15/09/03	324751	661323	5	4						
2	Japanese Knotweed	BW	KP	15/09/03	324762	661269	5	4						
2	Japanese Knotweed	BW	KP	15/09/03	324767	661183	4	2						
2	Japanese Knotweed	BW	KP	15/09/03	324729	661133	5	2						
2	Japanese Knotweed	AM/BW	KP	15/09/03	324731	661047	5	4						
2	Japanese Knotweed	BW	KP	15/09/03	324740	660963	5	5						TN4
2	Japanese Knotweed	BW	KP	15/09/03	324692	660876	5	5						TN5
2	Japanese Knotweed	BW	KP	15/09/03	324630	660882	4	2						
2	Japanese Knotweed	TR/SS/BW	KP	15/09/03	324518	660646	5	5						TN6
2	Japanese Knotweed	BW	KP	15/09/03	324449	660534	2	1						
2	Japanese Knotweed	BW	KP	15/09/03	324476	660435	2	4						TN7
2	Japanese Knotweed	BW	KP	15/09/03	324193	659991	1	1						
2	Japanese Knotweed	BW	KP	15/09/03	324170	659920	5	3						
2	Japanese Knotweed		KP	15/09/03	324135	659872	5	5						TN8

Appendix 2 (continued)

River North Esk

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	SBW	KP	15/09/03	324077	659801	5	2						
2	Japanese Knotweed	SBW/IS	KP	15/09/03	324066	659787	5	4						
2	Japanese Knotweed	SS/SBW	KP	15/09/03	324031	59746	5	2						
2	Japanese Knotweed	BW	KP	15/09/03	324003	659707	5	2						
2	Japanese Knotweed	AM/BW	KP	15/09/03	323879	659740	5	5						TN9
2	Japanese Knotweed	SBW/TR	KP	15/09/03	323760	659705	2	1						
2	Japanese Knotweed	SBW/TR	KP	15/09/03	323596	659576	5	5						TN10
2	Japanese Knotweed	AM/BW	KP	15/09/03	323686	659530	5	4						
1	Himalayan Balsam	AM/BW	KP	16/09/03	317953	657649	1	1						
1	Himalayan Balsam	AM/TR	KP	16/09/03	317975	657610	4	3						
1	Himalayan Balsam	MV	KP	16/09/03	318114	657531	1	1						
1	Himalayan Balsam	MV	KP	16/09/03	318160	657536	1	2						
1	Himalayan Balsam	TR/PCW	KP	16/09/03	318153	657493	1	1						
1	Himalayan Balsam	BW	KP	16/09/03	318092	657328	1	2						TN11
1	Himalayan Balsam	PBW	KP	16/09/03	318108	657178	1	1						
1	Himalayan Balsam	SAG	KP	16/09/03	318310	656447	1	1						
1	Himalayan Balsam	MG/BW	KP	16/09/03	318656	656248	1	2						Print 17
1	Himalayan Balsam	NIR/PBW	KP	16/09/03	320914	658394	1	1						
1	Himalayan Balsam	MV	KP	16/09/03	322732	659307	1	1						
3	Giant Hogweed	PBW/SH	KP	16/09/03	333400	668886	1	1						
3	Giant Hogweed	BW/PBW	KP	16/09/03	333334	668895	1	1						
1	Himalayan Balsam	NIR	KP	16/09/03	333462	668973	1	1						TN12
1	Himalayan Balsam	NIR	TR	15/09/03	330336	666087	1	1						P1
1	Himalayan Balsam	SNG	TR	15/09/03	330135	665357	2	1						P2
1	Himalayan Balsam	BW/SS/NIR	TR	15/09/03					329255	665202	330135	665640	2	

Appendix 2 (continued)

River North Esk

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	NR/SS/BW	TR	15/09/03	329780	665357	5	4						P3, TN29
2	Japanese Knotweed	BW	TR	15/09/03	329184	665153	5	4						P4
2	Japanese Knotweed	BW	TR	15/09/03	328603	664278	3	2						P5
1	Himalayan Balsam	BW	TR	15/09/03					328307	663487	328603	664278	2	P11, TN30
2	Japanese Knotweed	BW	TR	15/09/03					328480	664371	328567	664328	3	P6, P7, TN31
2	Japanese Knotweed	NR	TR	15/09/03	327365	662628	1	1						
2	Japanese Knotweed	BW	TR	15/09/03	327402	662838	5	5						
2	Japanese Knotweed	BW	TR	15/09/03	327188	662879	2	2						P14
2	Japanese Knotweed	BW/NR	TR	15/09/03	327074	662733		5						
2	Japanese Knotweed	BW	TR	15/09/03	326631	662377	4	3						
2	Japanese Knotweed	BW/NR	TR	15/09/03	326273	662023	5	4						
2	Japanese Knotweed	NR	TR	15/09/03	326166	661783	3	2						TN34
2	Japanese Knotweed	BW	TR	15/09/03	325331	661682	4	3						TN35
1	Himalayan Balsam	BW	TR	18/09/03					333297	667759	333305	667771	2	
2	Japanese Knotweed	BW	TR	18/09/03					333297	667759	333305	667771	3	P27
3	Giant Hogweed	BW	TR	18/09/03					333253	667954	333259	668006	2	TN44
1	Himalayan Balsam	BW	TR	18/09/03					333300	668500	333414	668570	3	P26
2	Japanese Knotweed	BW	TR	18/09/03					333500	668942	333516	668947	2	P24
3	Giant Hogweed	BW	TR	18/09/03					333457	668936	333474	668939	2	P25
1	Himalayan Balsam	BW/SNG/ AM	TR	18/09/03					330902	666838	332707	667250	1	TN45
2	Japanese Knotweed	BW/SNG/ AM	TR	18/09/03					330902	666838	332707	667250	3	P28
3	Himalayan Balsam	BW/SNG	TR	18/09/03					330336	666087	330575	666353	3	
4	Japanese Knotweed	BW/SNG	TR	18/09/03					330336	666087	330575	666353	2	

Appendix 2 (continued)

River South Esk

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing		Easting	Northing	Easting	Northing		
1	Himalayan Balsam	BW/SB	KP	18/09/03	333943	669100	3						
3	Giant Hogweed	BW	KP	18/09/03	334022	668822	1						TN13
3	Giant Hogweed	SH	KP	18/09/03	334027	668818	2						
1	Himalayan Balsam	TR	KP	18/09/03	334108	668679	1						
3	Giant Hogweed	MV/SNG	KP	18/09/03	334094	668658	1						
3	Giant Hogweed	SNG/PMW	KP	18/09/03	333903	668515	1						
1	Himalayan Balsam	BW	KP	18/09/03	333903	668515	1						
3	Giant Hogweed	SS/SH	KP	18/09/03	333731	668510	2						
1	Himalayan Balsam	TR/SH/BW	KP	18/09/03	333842	668416	2						
3	Giant Hogweed	BW	KP	18/09/03	333917	668390	1						
2	Japanese Knotweed	SH	KP	18/09/03	333970	668324	1						
3	Giant Hogweed	SH	KP	18/09/03	333970	668324	1						
1	Himalayan Balsam	TR	KP	18/09/03	333774	668262	1						
1	Himalayan Balsam	IS/TR/MV	KP	18/09/03	333815	668087	2						
2	Japanese Knotweed	IS/TR/MV	KP	18/09/03	333815	668087	5						
2	Japanese Knotweed	TR	KP	26/09/03	332724	659041	1						
2	Japanese Knotweed	PMW	KP	26/09/03	332710	658970	5						
2	Japanese Knotweed	BW	KP	26/09/03	333622	666859	5						
2	Japanese Knotweed	PMW	KP	26/09/03	333237	661948	2						
2	Japanese Knotweed	BW/TR	KP	29/09/03	333317	661772	1						
2	Japanese Knotweed	BW	KP	29/09/03	333340	661732	2						
2	Japanese Knotweed	BW	KP	29/09/03	333340	661732	2						TN14
2	Japanese Knotweed	BW/SH	KP	29/09/03	333340	661729	1						TN15
2	Japanese Knotweed	BW	KP	29/09/03	333898	661307	5						
2	Japanese Knotweed	VE/PCW	KP	30/09/03	333142	658334	3						
2	Japanese Knotweed		TR	29/09/03	332369	663539	1						TN46

Appendix 2 (continued)

River Esk

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Eastings	Northing			Eastings	Northing	Eastings	Northing		
1	Himalayan Balsam	NR/TR	TR	18/09/03	334260	672674	4	2						
1	Himalayan Balsam	NR	TR	18/09/03	334043	672527	5	5						
2	Japanese Knotweed	NR	TR	18/09/03	334043	672527	5	5						
1	Himalayan Balsam	BW/NR	TR	18/09/03					334555	671432	333785	672206	4	TN41, P18, P30
2	Japanese Knotweed	BW/NR	TR	18/09/03					334249	671778	333785	672206	3	P16, P17
3	Giant Hogweed	BW/NR	TR	18/09/03					333910	671558	333836	671798	3	TN40, P21
4	Giant Hogweed	BW/NR	TR	18/09/03					334555	671432	333910	671558	4	TN43, P22
2	Japanese Knotweed	BW/NR	TR	18/09/03					334555	671432	334249	671778	4	TN42, P19, P20
3	Giant Hogweed		TR	18/09/03					334702	670774	334555	671432	3	
2	Japanese Knotweed	BW/NR	TR	18/09/03					334702	670774	334555	671432	3	P23
1	Himalayan Balsam	BW/NR	TR	18/09/03					334702	670774	334555	671432	3	

Appendix 2 (continued)

River Almond

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	BW/I	KP	02/10/03					299098	662927	299188	662947	3	
2	Japanese Knotweed	PCW	KP	02/10/03	299227	663010	5	2						
2	Japanese Knotweed	TR/SNG	KP	02/10/03	299292	663105		3						
2	Japanese Knotweed	SNG	KP	02/10/03	299536	663070	5	4						
2	Japanese Knotweed	PMW	KP	02/10/03	299558	663104	4	3						
2	Japanese Knotweed	PMW	KP	02/10/03	299701	663104	5	5						TN16
2	Japanese Knotweed	SS	KP	02/10/03					299701	663104	300001	663085	3	
2	Japanese Knotweed	SS	KP	02/10/03	300001	663085	5	3						
2	Japanese Knotweed	SS/SNG	KP	02/10/03	300015	663101	4	4						TN17
2	Japanese Knotweed	SS/TR	KP	02/10/03	300260	663192	5	4						TN18
2	Japanese Knotweed	BW/TR	KP	02/10/03	300326	663187	5	5						TN19
2	Japanese Knotweed	BW	KP	02/10/03	300472	663243	5	5						
2	Japanese Knotweed	TR/SNG	KP	02/10/03	300940	663421	4	1						
2	Japanese Knotweed	SS/SNG	KP	02/10/03	301049	663567	4	1						TN20
2	Japanese Knotweed	SBW	KP	02/10/03	301055	663638	3	2						
2	Japanese Knotweed	TR	KP	02/10/03					301156	663661	301232	663694	3	
2	Japanese Knotweed	SNG	KP	02/10/03	301273	663698	5	2						TN21
2	Japanese Knotweed	SS	KP	02/10/03	301359	663795	5	4						TN22
2	Japanese Knotweed	SNG/A	KP	02/10/03	301613	664072	2	1						
2	Japanese Knotweed	SNG	KP	02/10/03					301630	664089	301710	664277	2	
2	Japanese Knotweed	SNG/A	KP	02/10/03	301729	664379	5	2						
2	Japanese Knotweed	TR/A	KP	02/10/03	301680	664426	5	5						
2	Japanese Knotweed	SS	KP	02/10/03	301681	664535	5	4						
2	Japanese Knotweed	MV/A	KP	02/10/03	301717	664630	5	4						

Appendix 2 (continued)

River Almond

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	BW	KP	02/10/03	301605	664811	5	3						
2	Japanese Knotweed	SS	KP	02/10/03	301718	664792	2	1						
2	Japanese Knotweed	SBW/SS	KP	02/10/03	301761	664862	3	2						
2	Japanese Knotweed	SS	KP	02/10/03	301700	664936	3	1						
2	Japanese Knotweed	MV/TR	KP	07/10/03	301674	666019	5	2						
2	Japanese Knotweed	SS	KP	07/10/03	301624	666045	5	4						
2	Japanese Knotweed	A/SBW	KP	07/10/03	298075	665458	5	4						
2	Japanese Knotweed	SS/TR	KP	08/10/03	298202	662511	2	1						
2	Japanese Knotweed	SS/SNG	KP	08/10/03	297277	661919	5	5						
2	Japanese Knotweed	PBW/SNG	KP	08/10/03	296390	661597	5	3						
2	Japanese Knotweed	SS	KP	08/10/03	295433	660913	4	1						
2	Japanese Knotweed	ESP/SS	KP	08/10/03	296273	660841	5	5						
2	Japanese Knotweed	SBW/EB	KP	13/10/03	301702	663234	5	5						TN23
2	Japanese Knotweed	SS	KP	13/10/03					300143	662859	301033	663162	3	TN24
2	Japanese Knotweed	TR	KP	13/10/03	301683	665078	5	4						
2	Japanese Knotweed	SS/TR	KP	13/10/03	301636	665592	5	3						
2	Japanese Knotweed	TR	KP	13/10/03	301650	665813	5	4						
2	Japanese Knotweed	TR	KP	13/10/03	301635	665481	1	1						
1	Himalayan Balsam	NR/BW/SS	TR	02/10/03					311178	671756	318406	676392	3	TN53, P32
2	Japanese Knotweed	NIR	TR	02/10/03	318247	676126	4	4						
2	Japanese Knotweed	BW/NIR/SS	TR	02/10/03					317707	675213	318247	676126	2	
2	Japanese Knotweed	BW	TR	02/10/03	317707	675213	5	5						TN54
2	Japanese Knotweed	NIR/SS	TR	02/10/03					316674	675132	317707	675213	2	
2	Japanese Knotweed	NR/SS	TR	02/10/03					316250	675510	316674	675132	3(4)	P33, TN55

Appendix 2 (continued)

River Almond

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	NR/SS	TR	02/10/03					315640	675046	316250	675510	2	
2	Japanese Knotweed	NR/SS	TR	02/10/03					315419	674738	315640	675046	4	
2	Japanese Knotweed	NR/SS	TR	02/10/03					312749	673881	315419	674738	2	
3	Giant Hogweed	NR/SS	TR	02/10/03	313895	673816								TN60
2	Japanese Knotweed	NR/SS	TR	02/10/03					313476	673813	312749	673881	5	TN56
2	Japanese Knotweed	NR/SS	TR	02/10/03					312364	673836	313476	673813	3	
1	Himalayan Balsam	NR	TR	02/10/03					311820	673836	311850	673426	2	
2	Japanese Knotweed	NR/SS/BW	TR	02/10/03					311929	672796	312364	673836	1	
2	Japanese Knotweed	NR/SS/BW	TR	07/10/03					308850	668991	311929	672796	2	
2	Japanese Knotweed	NR/SS/BW	TR	07/10/03					308621	668353	308850	668991	3	P34, P35
2	Japanese Knotweed	NR/SS/BW	TR	07/10/03					307675	667916	308621	668353	2	
2	Japanese Knotweed	NR/SS/BW	TR	07/10/03					305100	666905	307675	667916	3	TN57, P36, P37
1	Himalayan Balsam	NR/SS	TR	07/10/03	3107189	667743	2	1						TN58
2	Japanese Knotweed	NR/SS/BW	TR	07/10/03					302728	666689	305100	666905	2	
2	Japanese Knotweed	NR/SS/BW	TR	07/10/03	303526	666931								TN59
2	Japanese Knotweed	NR/SS/BW	TR	03/10/03	306744	665744	3	2						
2	Japanese Knotweed	NR/SS/BW	TR	03/10/03	305758	664430	2	1						
2	Japanese Knotweed	BW	TR	03/10/03	307669	667542	5	5						
2	Japanese Knotweed	AM/PBW/SS	TR	08/10/03					303333	666185	303970	666789	3	
2	Japanese Knotweed	AM/PBW/SS	TR	08/10/03					303031	665747	303333	666185	4	
2	Japanese Knotweed	AM/PBW/SS	TR	08/10/03	303250	664250	5	4						
2	Japanese Knotweed	AM/PBW/SS	TR	08/10/03	303218	663920	4	4						P38
2	Japanese Knotweed	BW/SS/H	TR	08/10/03					302650	662750	302896	663710	3	TN61

Appendix 2 (continued)

River Almond

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	BW/NR	TR	08/10/03					302380	664250	302986	665320	3	
2	Japanese Knotweed	BW/NR	TR	08/10/03					301667	663344	302380	664250	2	
2	Japanese Knotweed	BW/NR	TR	08/10/03					301096	663103	301667	663344	4	
2	Japanese Knotweed	A/BW/PBW	TR	16/06/04					311300	673184	311784	673198	2	
1	Himalayan Balsam	A/BW/PBW	TR	16/06/04					309474	672108	311784	673198	2	
2	Japanese Knotweed	H	TR	16/06/04	309350	671884	2	1						
2	Japanese Knotweed	H	TR	16/06/04					307929	672111	308115	672743	3	
1	Himalayan Balsam	H	TR	16/06/04					307929	672111	308115	672743	1	
2	Japanese Knotweed	H/BW	TR	16/06/04	306874	671817	4	4						
2	Japanese Knotweed	H/BW	TR	16/06/04					306302	671755	306471	671794	3	
2	Japanese Knotweed	H/BW	TR	16/06/04					306026	671656	306124	671662	4	
1	Himalayan Balsam	BW	KP	16/06/04	310572	672504	1	1						
2	Japanese Knotweed	A	KP	16/06/04	308981	671865	2	1						
2	Japanese Knotweed	TR	KP	16/06/04	308839	671792	5	3						
2	Japanese Knotweed	NR	KP	16/06/04	308743	371741	5	2						
2	Japanese Knotweed	A	KP	16/06/04	308698	671803	4	2						
2	Japanese Knotweed		KP	16/06/04					308167	671519	308191	671549	3	
2	Japanese Knotweed	A	KP	16/06/04	304692	671303	5	5						TN66/P40

Appendix 2 (continued)

River Tyne

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
1	Himalayan Balsam	BW	KP	15/10/03	361560	678741	2	4						
1	Himalayan Balsam	TR/SBW	KP	15/10/03					361312	678527	361521	678686	5	
1	Himalayan Balsam	TR/SBW	KP	15/10/03					360578	677573	361312	678527	4	
3	Giant Hogweed	TR/SBW	KP	15/10/03	360989	678219	2	1						
1	Himalayan Balsam	TR/SBW	KP	15/10/03					360043	677516	360578	677573	2	
1	Himalayan Balsam	SBW/BW	KP	15/10/03					359454	677798	360043	677516	3	
1	Himalayan Balsam	BW/TR	KP	15/10/03					359140	676879	359454	677798	1	
2	Japanese Knotweed	PBW	KP	15/10/03	359199	677732	4	3						
2	Japanese Knotweed	BW	KP	15/10/03	359271	677157	3	2						
1	Himalayan Balsam	TR	KP	15/10/03	359140	676875	5	3						
1	Himalayan Balsam	SBW/BW	KP	15/10/03					358781	676569	359140	676875	1	
2	Japanese Knotweed	PBW	KP	16/10/03	353293	667829	5	3						
2	Japanese Knotweed	BW	KP	16/10/03	352706	669077	5	5						TN 25
1	Himalayan Balsam	BW	KP	16/10/03	352555	668999	1	1						
2	Japanese Knotweed	BW/SB	KP	16/10/03	352578	668977	3	1						
2	Japanese Knotweed	BW	KP	16/10/03	352556	669074	5	4						Print 23
2	Japanese Knotweed	BW	KP	16/10/03	351768	669551	1	1						
2	Japanese Knotweed	BW/TR	KP	16/10/03	351644	669660	5	5						
2	Japanese Knotweed	BW	KP	16/10/03	351574	669632	5	3						
2	Japanese Knotweed	BW	KP	16/10/03					351111	669547	351454	669575	2	
2	Japanese Knotweed	BW	KP	16/10/03	350982	669617	5	4						
2	Japanese Knotweed	BW/PCW	KP	16/10/03	351170	670409	5	4						
2	Japanese Knotweed	BW/PCW	KP	16/10/03	351249	670496	5	4						
2	Japanese Knotweed	BW	KP	16/10/03	351335	670647	5	3						

Appendix 2 (continued)

River Tyne

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	TR	KP	16/10/03	351266	671056	2							
2	Japanese Knotweed	SBW	KP	16/10/03	361265	671194	5							TN26
2	Japanese Knotweed	BW	KP	16/10/03	351355	671185	5							
2	Japanese Knotweed	TR/SS	KP	16/10/03					351475	671320	351506	671307	4	
2	Japanese Knotweed	SBW	KP	16/10/03	351465	671390	4	2						
2	Japanese Knotweed	TR	KP	16/10/03	351476	671552	5	5						
2	Japanese Knotweed	PMW	KP	16/10/03	351431	671650	5	2						
2	Japanese Knotweed	PBW	KP	16/10/03	351314	671721	5	5						
2	Japanese Knotweed	PBW/IS	KP	16/10/03	351199	671712	4	3						
2	Japanese Knotweed	PBW	KP	16/10/03	351101	671683	5	5						TN27
1	Himalayan Balsam	BW	KP	17/10/03	361491	678730	5	3						
2	Japanese Knotweed	BW	TR	30/09/03	339159	666127	5	5						
2	Japanese Knotweed	BW	TR	01/10/03					343900	669430	344055	669021	4	TN47
2	Japanese Knotweed	BW	TR	01/10/03	345780	668934	5	5						TN48
2	Japanese Knotweed	NIR	TR	01/10/03	351696	674191	4	4						TN50
2	Japanese Knotweed	BW/NIR	TR	16/10/03	349137	671113	3	2						
2	Japanese Knotweed	EB	TR	16/10/03	348818	670880	3	2						TN51
2	Japanese Knotweed	BW/NIR	TR	16/10/03	348564	670902	5	4						
2	Japanese Knotweed	BW/NIR	TR	16/10/03	347306	670347	5	5						
2	Japanese Knotweed	BW/NIR	TR	16/10/03	345928	669060	4	3						P31
2	Japanese Knotweed	PMW	TR	16/10/03	345758	665526	5	4						
2	Japanese Knotweed	BW	TR	16/10/03	345916	664396	3	2						
2	Japanese Knotweed	PMW	TR	17/10/03	345817	661908	3	2						
2	Japanese Knotweed	BW	KP	15/06/04					345044	663842	345121	663864	2	

Appendix 2 (continued)

River Tyne

Sp. ID	Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
					Easting	Northing			Easting	Northing	Easting	Northing		
2	Japanese Knotweed	BW	KP	15/06/04	344966	663725	3	1						TN63/P8
2	Japanese Knotweed	BW	KP	15/06/04	344787	663627	1	2						
2	Japanese Knotweed	BW	KP	15/06/04	344741	663596	5	4						
2	Japanese Knotweed	BW	KP	15/06/04	344665	663563	1	1						
2	Japanese Knotweed	BW	KP	15/06/04	344075	663256	5	2						
2	Japanese Knotweed	BW	KP	15/06/04	344022	663222	2	2						
2	Japanese Knotweed	BW	KP	15/06/04					343659	662917	343838	663162	1	
2	Japanese Knotweed	BW	KP	15/06/04	343659	662917	5	5						TN64
2	Japanese Knotweed	BW	KP	15/06/04					342950	661505	343659	662917	2	
3	Giant Hogweed	VE	KP	15/06/04	342156	661902	1	1						TN65

Appendix 2 (continued)

Other aliens

Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
				Eastings	Northing			Eastings	Northing	Eastings	Northing		
North Esk													
Monkey Flower	SH	KP	15/09/03	324949	661809								
Monkey Flower		KP	15/09/03	324800	661637								
Rhododendron	PBW	KP	15/09/03	324628	661460	1	3						
Snowberry	BW	KP	15/09/03	324449	660534	?	5						TN28
Snowberry	AM	KP	15/09/03	324066	659787	2	2						
Snowberry	BW	KP	15/09/03	323950	659697	2	2						
Monkey Flower		KP	15/09/03	323879	659740								
Monkey Flower	AM	KP	16/09/03	317975	657610								
Rhododendron	AM/PCW	KP	16/09/03	321712	658812	locally dense							
Rhododendron	PMW	KP	16/09/03	321724	658772	1	1						
Monkey Flower	SH	KP	16/09/03	321724	658772								
Rhododendron	BW/NR	KP	16/09/03	321879	658891	1	1						
Rhododendron		KP	16/09/03	322093	659056		2						
Unknown spp.	AM/BW	KP	15/09/03	323686	659530	Garden escapes							
Monkey Flower	SH	KP	16/09/03					318175	656800	320914	658394	2	
Snowberry	BW/TR	TR	15/09/03					329259	665307	329575	665366	3	
Snowberry	BW	TR	15/09/03	328480	664371	5	4						P9
Rhododendron	BW	TR	15/09/03	328550	663870	5	5						PI0, TN32
Monkey Flower	SH	TR	15/09/03	2830	6350	1	1						TN33, P12
Monkey Flower	SH	TR	15/09/03	327388	662692	2	1						PI3
Monkey Flower	SH	TR	15/09/03	327074	662733	3	2						
Monkey Flower	SH	TR	15/09/03	326166	661783	2	1						
Monkey Flower	SH	TR	16/09/03					317322	656396	317916	656605	2	TN36
Monkey Flower	SH	TR	16/09/03					316854	656453	317322	656396	1	TN37

Appendix 2 (continued)

Other aliens

Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
				Easting	Northing			Easting	Northing	Easting	Northing		
North Esk													
Monkey Flower	SH	TR	16/09/03					316417	656605	316854	656453	3	TN38, P15
Monkey Flower	SH	TR	16/09/03					323221	657696	323430	658781	2	TN39
Snowberry	BW/SNG	TR	18/09/03	332125	667107	5	5						P29
South Esk													
Rhododendron	TR/MV	KP	18/09/03	333815	668087								
Cherry Laurel	AM/PMW	KP	18/09/03	331829	658932								
Rhododendron	AM/PMW	KP	18/09/03	331829	658932	Scattered/ locally dense							
Rhododendron	AM/PMW	KP	18/09/03	332061	659087	Abundant							
Cherry Laurel	AM/PMW	KP	18/09/03	332061	659087	Abundant							
Rhododendron	BW	KP	18/09/03	330567	658145	Locally dense							
Rhododendron	PBW	KP	29/09/03	333567	666176	Frequent scattered							
Snowberry		KP	29/09/03	333450	666003		2						
Rhododendron		KP	29/09/03	333450	666003	Occasional							
Monkey Flower	SH	KP	29/09/03	333138	665716								
Monkey Flower		KP	29/09/03	333898	661307								
Monkey Flower		KP	29/09/03	334202	657551								
Snowberry	AM	KP	29/09/03	335849	658899		2						
Snowberry	I	KP	29/09/03	336868	659522		2						
Snowberry	BW	KP	29/09/03	337000	659817		4						
Monkey Flower		KP	29/09/03	336727	659755								
Snowberry		KP	10/10/03	334712	661010	Scattered							
Snowberry		KP	10/10/03	334913	660640		5						
Monkey Flower		KP	10/10/03	334913	660640								

Appendix 2 (continued)

Other aliens

Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
				Easting	Northing			Easting	Northing	Easting	Northing		
South Esk													
Snowberry	PBW	KP	10/10/03	335074	659795								
Rhododendron	BW/PBW/ AM	TR	29/09/03	332369	663539	5							
Snowberry	MG/BW	TR	29/09/03	332700	661991	5							
Almond													
Snowberry	A/BW	KP	02/10/03	300018	665078	5							
Snowberry	AM	KP	02/10/03	298466	665354	Scattered							
Snowberry		KP	02/10/03	298113	665367	5							
Monk's rhubarb	SI	KP	08/10/03	296886	661718								
Snowberry		KP	13/10/03	301678	665432	4							
Rhododendron	BW/PMW	TR	02/10/03	318900	676900	Through parkland/ woods							
Snowberry	BW/PMW	TR	02/10/03	318406	676392	Occasional stands							
Rhododendron	BW/PMW/ AM	TR	07/10/03			Through parkland/ woods	308621	668353	308850	668991			
Snowberry	SS/NR/AM/ BW	TR	03/10/03			Occasional through riverside walks	305101	663925	306882	665999			
Rhododendron	SS/NR/AM/ BW	TR	03/10/03			Occasional through riverside walks	305101	663925	306882	665999			
Snowberry	BW	TR	03/10/03	306000	662683	4							
Snowberry	BW	TR	03/10/03	307669	667542	5							
Snowberry	BW	TR	03/10/03	302775	663508								
Rhododendron	BW/SS/ houses	TR	03/10/03			Occasional in gardens	302650	662750	302896	663710			
Snowberry	AM	KP	16/06/04	308305	671622	Dense stand							

Appendix 2 (continued)

Other aliens

Species	Habitat	Recorder	Date	Point Data NGR		Population	Size	Upstream NGR		Downstream NGR		Density	File notes
				Eastings	Northing			Eastings	Northing	Eastings	Northing		
River Tyne													
Monkey Flower		KP	15/10/03	358630	676473								
Snowberry		KP	15/10/03	357645	675996		5						
Snowberry		KP	16/10/03	351721	669648		3						
Rhododendron		KP	16/10/03	351721	669648		3						
Monkey Flower		KP	16/10/03	351644	669660								
Monkey Flower		KP	16/10/03	351335	670647								
Bamboo		KP	16/10/03	351199	671712								
Rhododendron	BW	KP	17/10/03	352133	668345								
Rhododendron	BW	KP	17/10/03	352536	668345								
Rhododendron	AM	KP	16/10/03	354000	667500								
Snowberry	BW/SNG	TR	30/09/03	339114	665456		4						TN62
Rhododendron	BW/SNG	TR	30/09/03	339114	665456								
Snowberry	BW	TR	01/10/03					343900	669430	344055	669021		TN47
Rhododendron	BW	TR	01/10/03					343900	669430	344055	669021		TN48
Snowberry	SS/NR	TR	01/10/03	341411	669803		4						
Snowberry	BW/SS	TR	01/10/03	344323	668929	5	5						
Snowberry	SS/NR	TR	01/10/03	345213	668789	5	5						
Monkey Flower	SH	TR	01/10/03	345488	668782		1						
Snowberry	BW	TR	15/10/03	356235	675191								TN49
Monkey Flower	SH	TR	15/10/03	353391	674568		1						
Snowberry		TR	15/10/03	351194	673243		4						
Rhododendron	BW	TR	16/10/03	346090	668673		5						TN52
Rhododendron	PMW/SNG	TR	17/10/03	346000	661700		5						
Monkey Flower	BW/SNG	TR	15/06/04				3	349560	663930	347146	665389		
Rhododendron	PMW	KP	15/06/04	343669	662974		3						

Appendix 2 (continued)

Unseen sections

Habitat	Recorder	Date	Upstream NGR		Downstream NGR		Reason unseen
			Easting	Northing	Easting	Northing	
North Esk							
BW	TR	15/09/03	328800	664822	328603	664278	V Steep
various	TR	18/09/03	332955	667804	333297	667759	Housing
BW	TR	18/09/03	332707	667250	332957	667574	Steep dense woods
BW	KP	15/09/03	324490	660625	324550	660875	Dense woods and scrub
BW	KP	15/09/03	324650	660875	324700	660875	Steep dense woods
AM/BW	KP	16/09/03	317975	657610	318114	657531	Private gardens – partially seen
Built up	KP	16/09/03	323076	659403	323596	659576	Built up – seen from either end but not walked
South Esk							
BW	TR	29/09/03	333050	661945	332900	661940	Private grounds
BW	TR	29/09/03	332425	662928	332307	663281	Dense woodland
SS/PCW/SBW	KP	18/09/03	333700	668500	333903	668515	Electric fence! Seen intermittently with binoculars
PCW	KP	29/09/03	334494	657693	334925	657875	Dense conifer plantation
AM/Built up	KP	29/09/03	333550	666925	333900	667575	Urban
	KP	01/10/03	334539	661124			Gardens/dense woodland downstream
BW	KP	26/09/03	331000	656950	331829	658932	Deep ravine – unseen intermittently
BW	KP	26/09/03	332550	659150	332275	659075	Private grounds
Esk							
BW	TR	18/09/03	334438	662512	334702	670774	Private, walled
River Almond							
BW	TR	03/10/03	306882	665999	307669	667544	
DS/TR	KP	02/10/03	300610	663190	300855	663400	Dense scrub blocking access
Built up	TR	16/06/04	309286	671884	309432	671917	Housing/gardens
Built up	TR	16/06/04	306874	671817	307920	671830	Housing/gardens

Appendix 2 (continued)

Unseen sections

Habitat	Recorder	Date	Upstream NGR		Downstream NGR		Reason unseen
			Easting	Northing	Easting	Northing	
River Tyne							
BW	TR	30/09/03	338972	660072	338021	660586	Steep dense woods
MG/SP	TR	30/09/03	337750	660400	337900	660800	Swamp
PMW	TR	15/10/03	350613	673053	350857	673191	Built-up housing, dense woodland
PMW	TR	16/10/03	345966	668205	345800	668750	Dense Rhododendron woods
PCW	TR	16/10/03	345751	668205	345950	667750	Dense Plantation
PMW	TR	16/10/03	346100	664600	345600	667750	Seen intermittently
	TR	16/10/03	346090	663000	346075	664575	Unseen intermittently
AM	KP	16/10/03	354295	667200	353800	667530	Private grounds
PMW	TR	15/06/04	347146	665389	346020	666168	Steep dense woods

Appendix 3 Annex C recording form



Species (tick box): Giant Hogweed <input type="checkbox"/> Japanese Knotweed <input type="checkbox"/> Himalayan Balsam <input type="checkbox"/>	Date:
Recorder(s) name:	NGR:
River/catchment name:	
Broad habitat and associated habitat (if appropriate):	

STAND SIZE (m²)	1-10	11-30	31-50	51-100	≥100 (please describe)
area occupied (tick)					

POPULATION SIZE	1-10	11-30	31-50	51-100	≥100 (please describe)
total number of individuals (tick)					