Hampshire & Isle of Wight Wildlife Trust

The New Forest Non-Native Plants Project

Report of activities during the first ten years:
May 2009 – December 2019

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Front Cover: Photograph by Catherine Chatters of Guides pulling Himalayan balsam

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Summary

The New Forest Non-Native Plants Project was set up in May 2009 to stop the spread of invasive non-native plants in the New Forest area, particularly along river valleys and in wetland habitats. The Project is hosted by Hampshire and Isle of Wight Wildlife Trust and supported by a partnership of organisations.

The New Forest Non-Native Plants Project was funded initially as a three year Project. Additional funding has enabled the Project to continue beyond the initial three year period and this report summarises the activities during the first ten years from May 2009 to December 2019.

The introductory section of this report outlines the need for the Project, summarises the aims of the Project and emphasises the importance of effective partnership working to implement, at the local level, a strategic approach to address the problems caused by invasive non-native species.

Recording and distribution mapping is the subject of the second section of the report.

The report emphasises the need for effective partnership working with landowners to achieve control and eradication at the catchment scale.

Work to control a wide range of invasive non-native plants, undertaken by professional contractors and by volunteers, is summarised in the fourth section of the report. Case studies are provided as examples of the effectiveness of control work.

The research undertaken on behalf of the Project is highlighted. Examples include research commissioned by the Project to control New Zealand pygmyweed, research into the impact of American skunk cabbage on native vegetation and a study of the quality of habitats affected by Himalayan balsam. Examples of research undertaken by students and volunteers are also featured.

Awareness-raising is an important element of the Project and the report describes a number of techniques used to increase understanding of the problems caused by invasive non-native plants.

The report outlines the Project's participation in RINSE, a European funded initiative which aimed to improve the management of invasive non-native species across four partner countries in Western Europe by sharing best practice and adopting strategic approaches to tackle the threats posed by invasive non-natives.

The Project's success is dependent on a large number of enthusiastic volunteers. The report highlights the wide range of opportunities for volunteer involvement, including practical control work, undertaking research and surveys and helping at awareness-raising events.

The report outlines the Project's participation in the Lottery-funded 'Our Past, Our Future' New Forest Landscape Partnership Scheme.

Other activities undertaken by the Project are featured in the report. These include responding to consultations relating to proposed changes in legislation; responding to the review of the Great Britain Invasive Non-Native Species Framework Strategy; responding to consultations relating to proposals for biological control; tackling the problem of dumping of garden waste and liaison with other organisations and projects which aim to stop the spread of invasive non-native plants.

The report concludes by considering the future of the Project during 2020/21 and beyond.

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APPENDICES

1. INTRODUCTION

1.1. Hampshire and Isle of Wight Wildlife Trust

Hampshire and Isle of Wight Wildlife Trust (hereafter 'the Trust') is the leading nature conservation charity in the two counties of Hampshire and the Isle of Wight. With support from over 25,000 members and 1,500 volunteers, HIWWT works to protect wildlife and wild places, managing nature reserves, running education centres and offering advice to landowners and land managers. HIWWT is part of a UK-wide partnership of 46 local Wildlife Trusts, with a collective membership of more than 800,000 people working together to conserve our precious natural heritage.

1.2. The New Forest Non-Native Plants Project

The New Forest Non-Native Plants Project (NFNNPP) was set up in May 2009 to help stop the spread of invasive non-native plants in the New Forest area, particularly along watercourses and in wetland habitats. The Project is hosted by the Trust and supported by a partnership of organisations.

Many non-native plants have been introduced to the UK as garden plants, where they have grown quickly, spread rapidly and invaded the countryside, causing damage to the environment and the economy and, in some cases, even posing a risk to human health. Some invasive non-native plants have become established in the countryside due to irresponsible disposal; others have become established in the countryside due to deliberate planting.

A number of invasive non-native plants are listed in Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). It is an offence under section 14(2) of this Act to plant these species in the wild or to otherwise cause them to grow in the wild.

A number of invasive non-native plants are included in the list of 'invasive alien species of Union Concern' relating to Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (the 'Invasive Alien Species Regulation'). In accordance with Article 7 of this Regulation, these species shall not be intentionally grown, permitted to reproduce or be released into the environment. Member States shall take all necessary steps to prevent their unintentional introduction or spread.

Although individual landowners have responsibility for preventing the spread of these species, co-ordinated control at the catchment scale is necessary if they are to be eradicated but this will realistically only be achieved if landowners are given encouragement and practical help. The NFNNPP performs a pivotal role in co-ordinating control at the catchment scale and giving support and assistance to landowners.

Catherine Chatters was appointed by the Trust as full time Project Officer to commence work on 11th May 2009 and the Project was officially launched on 22nd May 2009 (Figure 1).

During May 2010, with funding from Natural England, Joanne (Jo) Gore was appointed by the Trust as a part-time Project Officer with the NFNNPP to help stop the spread of invasive non-native plants on the River Avon and its tributaries which flow westwards off the New Forest. The Environment Agency funded the work in the Avon Valley during 2011/12.

Jo continued in this role with the NFNNPP until May 2012 when she worked as a Field Officer with 'Source to Sea', a collaborative project with Wiltshire Wildlife Trust to stop the spread of invasive non-native plants in the River Avon catchment.

Since 2016 the NFNNPP has received the majority of its funding from the Heritage Lottery Fund / National Lottery Heritage Fund through the New Forest 'Our Past, Our Future' (OPOF) Landscape Partnership Scheme. Led by the New Forest National Park Authority working with several delivery partners including the Trust, the Landscape Partnership is undertaking a range of projects to restore lost habitats, develop people's skills and inspire a new generation to champion and care for the New Forest. The Landscape Partnership aims to ensure that the New Forest's distinctive landscape survives through future change and modern-day pressures.

The NFNNPP is currently mainly resourced through a combination of the National Lottery Heritage Fund, the New Forest Higher Level Stewardship Scheme and funding from Forestry England. Catherine Chatters is employed as a full time Project Officer and Jo Gore is employed as a part-time Project Officer.

Figure 1: Launch of the New Forest Non-Native Plants Project at Lepe Country Park on 22nd May 2009 (Photograph: Peter Hutchings).

The New Forest Non-Native Plants Project aims to:

- identify where invasive non-native plants are a problem, particularly within river valleys and in wetland habitats;
- arrange for control work to be undertaken by volunteers and contractors;
- commission research into control methods;
- raise awareness of the need to control invasive non-native plants and prevent them spreading into the countryside.

A Steering Group is chaired by a representative of the Trust and meets three times a year, usually during January, May and September. Currently, the Steering Group comprises representatives of the Trust, the New Forest National Park Authority, Forestry England, Natural England and the Environment Agency.

A Forum meeting is held once a year, usually during early March. The Forum meeting is an opportunity for information exchange between the Project Officers and a wide range of interest groups including landowners, land managers, volunteers, local naturalists, non-government organisations and statutory bodies.

Since 2009 funding for the New Forest Non-Native Plants Project has been secured from a variety of sources including:

- DEFRA
- Environment Agency
- Natural England
- Forestry Commission / Forestry England
- The Heritage Lottery Fund / National Lottery Heritage Fund administered through The New Forest ‘Our Past, Our Future’ landscape partnership scheme
- New Forest National Park Authority’s Sustainable Development Fund
- The New Forest Higher Level Stewardship scheme
- The New Forest Trust
- donations from landowners.

The Project initially aimed to focus on five invasive non-native plants, namely Himalayan balsam *Impatiens glandulifera*, Japanese knotweed *Fallopia japonica*, giant hogweed *Heracleum mantegazzianum*, American skunk cabbage *Lysichiton americanus* and New Zealand pygmyweed *Crassula helmsii*.

Since then the number of target species has increased five-fold to include parrot's feather *Myriophyllum aquaticum*, orange balsam *Impatiens capensis*, Himalayan knotweed *Persicaria wallichii*, montbretia *Crocosmia* x *crocosmiiflora*, pitcher plant S*arracenia purpurea*, Venus fly trap *Dionaea muscipula*, bog arum *Calla palustris*, buddleia *Buddleia* spp, Iris *Iris laevigata*, Himalayan honeysuckle *Leycesteria formosa*, yellow azalea *Rhododendron luteum*, pickerel weed *Pontederia cordata*, floating pennywort *Ranunculus ranunculoides*, golden club *Orontium aquaticum*, variegated yellow archangel *Lamiastrum galeobdolon* subsp. *argentatum*, pink purslane *Claytonia sibirica*, cotoneaster *Cotoneaster horizontalis*, gaultheria *Gaultheria shallon*, three-cornered garlic *Allium triquetrum*, golden rod *Solidago canadensis*, periwinkle *Vinca major*, spiraea *Spiraea* sp, sheep laurel *Kalmia angustifolia*, creeping water primrose *Ludwigia grandiflora* and bamboo.

Partnership working is fundamental to the success of the Project and effective partnerships have been developed with landowners, volunteers, contractors and local naturalists. Although it is the landowner's responsibility to stop the spread of many of the plants listed above, the Project recognises that partnership working, co-operation and co-ordination are essential if invasive non-native plants are to be controlled effectively or eradicated at the catchment scale, particularly in areas characterised by a very fragmented pattern of land ownership.

The New Forest Non-Native Plants Project helped to implement, at the local level, The Invasive Non-Native Species Framework Strategy for Great Britain published in 2008 by Department for Environment, Food and Rural Affairs (DEFRA, 2008) which recognised that 'one of the greatest threats to biodiversity across the globe is that posed by invasive non-native species'.

Since the review of the original Strategy, the Project now helps to implement The Great Britain Invasive Non-Native Species Strategy published in 2015 by Department for Environment, Food and Rural Affairs (DEFRA, 2015).

This Strategy recognises that invasive non-native species 'are a significant and growing problem'. It provides a high level framework, recognises the need for control at the catchment scale and acknowledges that effective partnership working by local action groups such as the New Forest Non-Native Plants Project is critical to the successful control and eradication of invasive non-native species.

1.3. Why Control Invasive Non-Native Plants in the New Forest?

The New Forest (Figure 2) is recognised as being of high landscape and ecological importance through its designation as a National Park.

The core of the New Forest National Park is the Crown Land managed by Forestry England. The Crown Land comprises plantation woodlands and the Open Forest which is characterised by lowland heathland, acid grassland and ancient woodland habitats which retain their landscape character and wildlife value through the activities of the commoners who exercise their rights to graze their animals (ponies, cattle, donkeys, pigs and sheep) on the Open Forest.

The core area of Open Forest and plantation woodlands is fringed by privately-owned land within the National Park, some of which is managed by commoners to provide 'back-up' land for their animals to graze during the winter when the Open Forest does not provide sufficient food to sustain them. Many of the privately-owned fields surrounding the Crown Land are increasingly being managed as amenity land or are used as grazing for recreational horse-keeping, with the fields fenced to separate the animals from the adjacent watercourse. Such changes in management have implications for the spread of invasive non-native plants.

The high number of statutory nature conservation sites within the New Forest reflects its ecological importance. Much of the land within the National Park has been notified as Sites of Special Scientific

Interest in accordance with the Wildlife and Countryside Act 1981 (as amended) and the National Park contains National Nature Reserves designated under the National Parks and Access to the Countryside Act 1949.

The internationally important extensive areas of lowland heathland, ancient woodland, valley mires, river valleys and coastal marshes support a very high number of nationally rare (and some internationally rare) species.

The majority of the New Forest National Park lies within the Natura 2000 network of European Sites, through designation as a Special Area of Conservation under the EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora and/or through classification as a Special Protection Area under the Wild Birds Directive (Council Directive 79/409/EEC). Large areas are also designated as Ramsar sites (wetlands of international importance) under the terms of the Ramsar Convention held in Iran during 1971.

These ecologically important habitats in the New Forest area are vulnerable to invasion by non-native plants.

The control of invasive non-native plants in the New Forest area is justified by a) the high concentration of ecologically important habitats and b) the potential for habitat restoration.

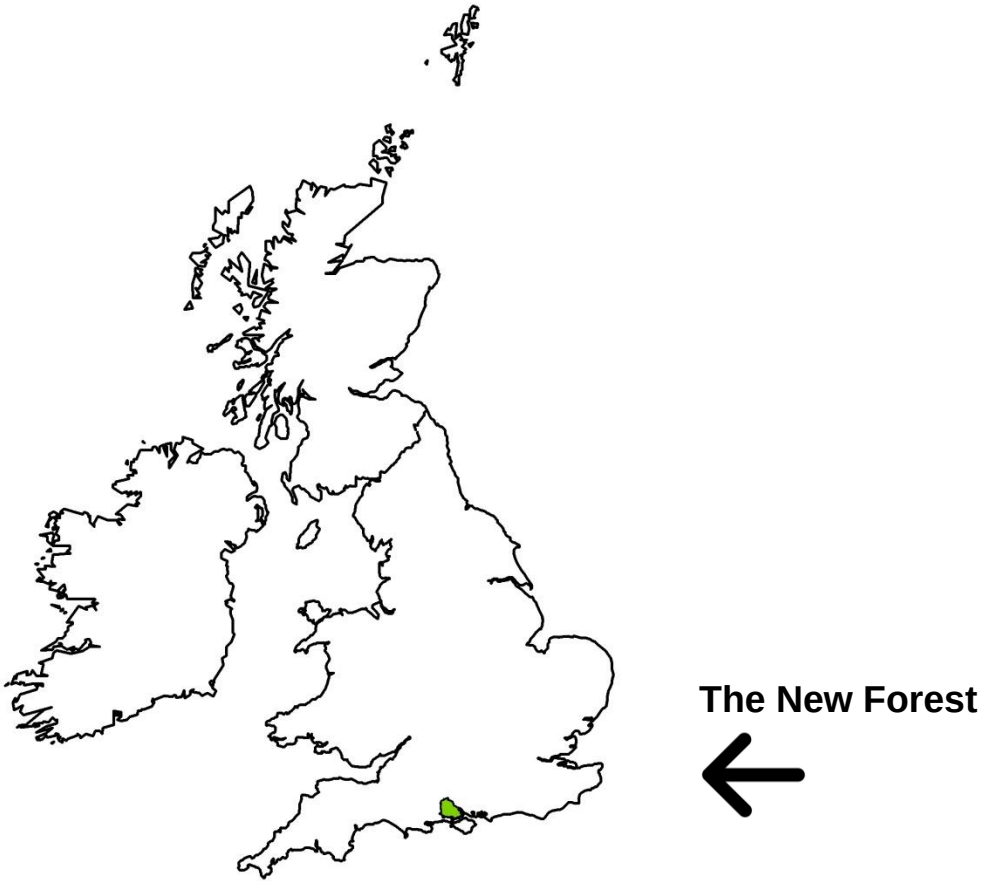

Figure 2: Location of the New Forest, Hampshire.

2. DISTRIBUTION MAPPING

One of the aims of the New Forest Non-Native Plants Project is to identify where invasive non-native plants are a problem in the New Forest area, particularly within river valleys. Records are made by the Project Officer; volunteers, local residents and naturalists also submit their sightings. A recording card was designed at the start of the Project to enable people to submit their records; alternatively records can be submitted electronically via the Trust's website (www.hiwwt.org.uk) or directly to the Project Officers.

A distribution map (Figure 3) created by the Trust helped the Project to prioritise effort and resources.

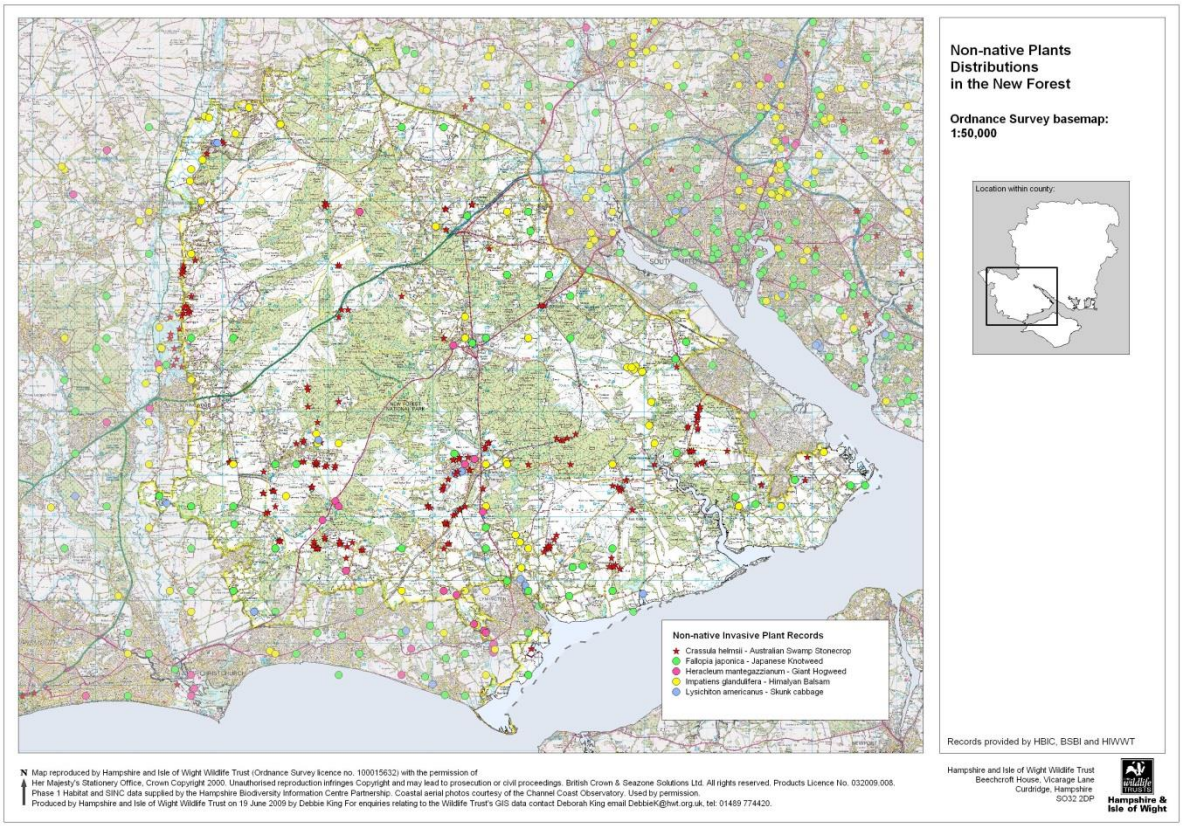

Figure 3: Distribution map created in 2009 using records collated by the Project Officer at the start of the New Forest Non-Native Plants Project.

3. LANDOWNER LIAISON

Liaison with landowners (Figure 4) has been a major element of the Project. A significant amount of time was spent, particularly at the start of the Project, identifying landowners who have invasive non-native plants on their land. This has been achieved through sending letters to relevant properties, asking neighbours, attaching notices to field gates asking the owner to make contact with the Project Officers and, in a few cases, undertaking Land Registry searches. The fragmented pattern of landownership and the frequency of land being bought and sold have added to the challenge of ascertaining the current owners.

As it is important for all relevant landowners to co-operate to achieve control and eradication at the catchment scale, the Project Officers have convened meetings to help riparian landowners understand the need for control and to foster a sense of responsibility. For example, meetings have been hosted by the Project for landowners along the Avon Water to discuss the need for a co-ordinated approach to the control of giant hogweed which had colonised over 40 separate properties along the banks of this particular river. The Project Officers have hosted meetings with groups of riparian owners along the Mill Lawn Brook and the Cadnam River to encourage them to cooperate to tackle Himalayan balsam.

The Project Officers have contacted landowners to secure their agreement to work being undertaken and to request funding towards control work undertaken by professional contractors.

Other landowners have approached the Project Officers seeking advice on the control of invasive non-native plants on their land. Where appropriate, the Project Officers have undertaken site visits and provided advice.

Figure 4: The Project Officer during a site visit with riparian owners to discuss the control of Himalayan balsam (Photograph: Clive Chatters).

4. CONTROL WORK

4.1. Control Undertaken by Contractors

4.1.1. Control of giant hogweed

Giant hogweed along the Avon Water

During 2009 the Project Officer ascertained the ownership of all sections of the Avon Water which had been colonised by giant hogweed (Figure 5). A meeting for landowners was convened by the Project Officer in October 2009 to raise awareness about the problems caused by this species. All relevant landowners subsequently agreed to a co-ordinated programme of control; a few landowners agreed to control the giant hogweed on their land by digging whilst the majority of landowners agreed to herbicide treatment by professional contractors organised by the Project Officer.

The first co-ordinated herbicide treatment was undertaken during 2010. Since then two herbicide treatments have been undertaken each year from 2011 to 2019. The costs of herbicide treatment were met by the NFNNPP in 2010, 2011, 2012 and 2013. During 2014 grant aid was provided by the New Forest National Park Authority's Sustainable Development Fund and supplemented by donations from landowners. Herbicide treatment during 2015 was funded by a grant from The New Forest Trust and donations from relevant landowners. Funding for the control of giant hogweed in 2016, 2017, 2018 and 2019 was provided by the Heritage Lottery Fund / National Lottery Heritage Fund through the 'Our Past, Our Future' Landscape Partnership scheme.

Other sites

The NFNNPP arranged for herbicide treatment of giant hogweed to be undertaken on the north bank of the Cadnam River at Wittensford House during 2013 and on Crown Land near Brockenhurst during 2018 and 2019.

Figure 5: Giant hogweed at one of many sites along the Avon Water during October 2009 prior to the control programme co-ordinated by the New Forest Non-Native Plants Project (Photograph: Trevor Renals, Environment Agency).

4.1.2. Control of Japanese knotweed

The NFNNPP has arranged for Japanese knotweed to be controlled using approved herbicides on Crown Land (on the Open Forest and elsewhere, for example within Inclosures), on other publicly-owned land and on privately-owned land. Funding for work on the Open Forest has been provided by the New Forest Higher Level Stewardship scheme and funding for work elsewhere on Crown Land has been provided by the Forestry Commission/Forestry England. Funding for work on Pennington Common has been provided by the Higher Level Stewardship scheme for this site. Since 2016, funding for work along the Cadnam River has been provided by the Heritage Lottery Fund / National Lottery Heritage Fund through the 'Our Past, Our Future' Landscape Partnership scheme.

The NFNNPP has arranged for control of Japanese knotweed at the following locations:

<u>Crown Land on the Open Forest</u>

- bank of Mill Lawn Brook in vicinity of Turf Croft Farm upstream of Burley
- bank of stream in Brockenhurst at junction of Meerut Road and Butts Lawn
- Emery Down
- bank of ditch near Home Farm, Bartley
- Bartley, near junction of Shepherd's Road and Chinham Road
- Vereley, near Burley
- Mill Lane, Burley
- Land off Beechwood Lane, Burley
- Land on former allotments at Lyndhurst

<u>Crown Land within Inclosures etc</u>

- Pondhead Inclosure
- Hawkhill Inclosure
- Busketts Lawn Inclosure
- Norleywood Inclosure
- land adjacent to Woodlands Road near Ashurst
- in vicinity of buildings at New Park
- in vicinity of The Pig Hotel, near Brockenhurst
- land behind the fire station in Lyndhurst

<u>Other publicly-owned land</u>

- Pennington Common
- Walhampton substation in vicinity of SZ 327 962
- White's Copse, Burley

<u>Privately-owned land</u>

- Forest Lodge, East Boldre
- The Yews, East Boldre
- Woodside Farm, Lymington
- Weaver's Cottage, Emery Down
- Hillview, Linwood
- Bridge Cottage, Bartley, near junction of Shepherd's Road and Chinham Road
- Newlands Manor Wood
- Campden House, Burley
- The Orchard, Burley
- Marlborough House, Burley
- Pantiles, Lyndhurst
- bank of the Cadnam River (multiple sites)

<u>Land within HIWWT nature reserve</u>

- land within Lymington Reedbeds Nature Reserve

4.1.3. Control of American skunk cabbage

Lymington Reedbeds nature reserve

The NFNNPP undertook trials during 2010 to assess the relative effectiveness of two herbicides (Roundup Pro-Biactive and 2,4-D amine) to control American skunk cabbage growing in the Trust's Lymington Reedbeds nature reserve. The trials revealed the glyphosate-based herbicide Roundup Pro-Biactive to be more effective than 2,4-D amine. The Project Officer arranged for a glyphosate-based herbicide to be used to control the American skunk cabbage growing in the nature reserve each year from 2011 to 2019.

Privately-owned land within Lymington River Reedbeds Site of Special Scientific Interest (SSSI)

The NFNNPP arranged for a contractor to control American skunk cabbage on behalf of the landowner of the part of the Lymington River Reedbeds SSSI immediately upstream of the Trust's Lymington Reedbeds nature reserve during 2011, 2012 and 2013. The work was undertaken using Roundup Pro-Biactive. No herbicide treatment was commissioned by the NFNNPP during 2014 as the landowner commissioned the contractor to undertake the work that year. The NFNNPP resumed involvement at this site during 2018 and commissioned the contractor to undertake herbicide treatment in 2018 and 2019.

Boldre

The Project Officer arranged for American skunk cabbage to be treated in wet woodland at SZ 32528 99213 using Roundup Pro-Biactive during 2010 and 2011. The Project Officer visited the site on 19th May 2012 and found a single American skunk cabbage seedling which she removed by hand.

Bull Hill, Pilley

The NFNNPP arranged for a contractor to control American skunk cabbage growing on the bank of a stream at Bull Hill Farm, Pilley at SZ 33978 97839 and SZ 33975 97842 using Roundup Pro-Biactive during 2013.

Mill Lawn Brook, Burley

American skunk cabbage plants were treated along the Mill Lawn Brook, on the Open Forest downstream of Burley using Roundup Pro-Biactive during 2010 and each year up until and including 2019. The New Forest Higher Level Stewardship scheme has contributed towards the cost of the work undertaken here.

Batchley Farm

The NFNNPP arranged for a contractor to control American skunk cabbage growing in wet woodland at Batchley Farm using Roundup Pro-Biactive during 2013.

Harcourt Wood, Minstead

Since 2016 the NFNNPP has arranged for a contractor to control American skunk cabbage each year in wet woodland along the Fleet Water near Minstead. This work has been funded by the Heritage Lottery Fund / National Lottery Heritage Fund through the New Forest 'Our Past, Our Future' Landscape Partnership Scheme.

4.1.4. Control of parrot's feather

In 2009 the Forestry Commission asked the Project Officer to arrange for parrot's feather (Figure 6) to be controlled at the following four sites on the Open Forest:

- Hincheslea Bog at SU 270 004
- Castle Hill, Burley at SU 198 039
- East End at SZ 366 976
- Bartley at SU 302 130

Herbicide treatment was undertaken using Roundup Pro-Biactive on 30 October 2009. Two treatments were undertaken each year in 2010 and at relevant sites until 2019, with a third interim treatment undertaken at Hincheslea Bog since 2016. The herbicide treatments were usually undertaken during June and September, depending on weather conditions (Figure 7). No parrot's feather was found by the contractors in the pond at Bartley during 2014. By 2015 the main part of the pond at East End was clear of parrot's feather, with only relatively small amounts growing around the margins and these

were removed by hand. By 2018 no parrot's feather was found at Castle Hill. From 2011 the cost of the treatment has been met by the New Forest Higher Level Stewardship scheme.

Figure 6: Parrot's feather at Hincheslea Bog photographed on 1st October 2009.

Figure 7: Contractors controlling parrot's feather at East End on 23rd June 2010.

4.1.5. Control of bog arum

Bog arum (Figure 8) was discovered growing in a tributary of the Beaulieu River by a Trust volunteer during 2011. The Project arranged for it to be treated with an approved glyphosate-based herbicide during 2011, 2012, 2013, 2014, 2015, 2016 and 2017. A contractor was commissioned to undertake treatment work, if necessary, during 2018 and 2019 but no bog arum was found (by the Project Officer or by the contractor) growing here in those two years.

Figure 8: Bog arum in a tributary of the Beaulieu River at grid reference SU 39524 07162 on 12th April 2011.

4.1.6. Control of Himalayan knotweed

The NFNNPP arranged for Himalayan knotweed to be treated at Pennington Common (Figure 9) in the vicinity of SZ 29929 95641 on behalf of Lymington and Pennington Town Council since 2012 during late summer or early autumn using Roundup Pro-Biactive. The contractor was commissioned to undertake work each year until 2017 since when there has been no need for further treatment. The control of Himalayan knotweed was funded by the Higher Level Stewardship agreement for Pennington Common.

Figure 9: Himalayan knotweed growing at Pennington Common on 14th October 2010 prior to herbicide treatment which commenced in 2012.

4.1.7. Control of bamboo

The NFNNPP has arranged for bamboo to be treated with an approved glyphosate-based herbicide each year since 2012 at Pennington Common in the vicinity of SZ 30013 95234 and SZ 30343 95149 on behalf of Lymington and Pennington Town Council. The work was undertaken during late summer or early autumn and has been funded by the Higher Level Stewardship agreement for Pennington Common.

4.1.8. Control of Himalayan honeysuckle

The NFNNPP arranged for Himalayan honeysuckle to be treated with Roundup Pro-Biactive at Emery Down and Nomansland during 2013 and 2014. These sites are on Crown Land within the Open Forest and the work was funded through the New Forest Higher Level Stewardship scheme. No Himalayan honeysuckle was found by the contractor at Nomansland during 2014. Although the NFNNPP commissioned a contractor to undertake herbicide treatment at Emery Down in 2015 no Himalayan honeysuckle was found here that year.

4.1.9. Control of montbretia

Montbretia was treated with the herbicide Roundup Pro-Biactive at the following locations during 2014:

- bank of the Mill Lawn Brook, downstream of Burley at SU 23094 03644 and SU 22762 03575
- bank of the Fleet Water to the west of the A337 between Lyndhurst and Cadnam at SU 29554 10061

The work to control Montbretia along the Mill Lawn Brook continued each year until 2018. By 2019 there was no need for further herbicide treatment at this location.

In 2017 a contractor was commissioned to control Montbretia on Crown Land along Woodlands Road and this work continued in 2018 and 2019. During 2017 a contractor was commissioned to control Montbretia on Crown Land in Burley and this work continued in 2018 and 2019. In 2019 a contractor was commissioned to control Montbretia in Pondhead Inclosure.

4.1.10. Control of buddleia

The NFNNPP arranged for buddleia to be controlled at SU 28577 13653 near Wittensford during 2013 and 2014. This site is on Crown Land within the Open Forest and the work was funded through the New Forest Higher Level Stewardship scheme. During 2013 the buddleia was cut down and the stump was treated with Roundup Pro-Biactive. During 2014 the Project Officer arranged for work to be undertaken, but no treatment was required as the work undertaken the previous year appeared to have been successful.

The NFNNPP arranged for buddleia to be controlled on Crown Land near Markway at grid reference SU 24753 03128 during 2016; the buddleia was cut and the stumps treated with herbicide. Further treatment was undertaken during 2017. During 2018 the Project Officer arranged for work to be undertaken, but no treatment was required as no buddleia could be found and the work undertaken the previous year appeared to have been successful.

4.1.11. *Control of Iris laevigata*

Iris laevigata (Figure 10-12) was treated with the herbicide Roundup Pro-Biactive at three locations during 2014:

- ditch to the north of Lyndhurst in vicinity of SU 29948 08775
- Latchmoor Pond between Brockenhurst and Sway at SU 29245 00370
- pond in Wootton Coppice Inclosure at SZ 24624 99569

Work continued each year until 2018 when no *Iris laevigata* was found in the pond in Wootton Coppice Inclosure. By 2019 it had been eradicated from the ditch at Lyndhurst and from Latchmoor Pond.

During 2019 the NFNNPP commissioned a contractor to control the *Iris laevigata* in the pond near Hardley Bridge at SU 420 047.

Figure 10: *Iris laevigata* growing at Latchmoor Pond photographed on 29th May 2014.

Figure 11: *Iris laevigata* growing in Wootton Coppice Inclosure photographed on 20th June 2014.

Figure 12: *Iris laevigata* growing at Latchmoor Pond and photographed on 29th May 2014.

4.1.12. Control of Himalayan balsam

The NFNNPP commissioned contractors to undertake control of Himalayan balsam (Figure 13) using herbicide treatment or hand-pulling. Chemical treatment using herbicide approved for use near water was undertaken at a few locations on the banks of the Cadnam River. This has involved Roundup Pro-Biactive and 2,4-D amine.

Figure 13: Himalayan balsam (Photograph: Ashley Basil).

Control was undertaken by a contractor along the Lymington River and its tributaries the Passford Water and the Mill Lawn Brook by hand-pulling. This was particularly effective as work continued into the autumn, thereby controlling plants which germinated relatively late in the season or which were hidden by, for example, scrub and brambles earlier in the summer. The contractor also led volunteer work parties (Figure 14) to hand-pull Himalayan balsam on the Lymington River and its tributaries.

Figure 14: Volunteers during balsam-pull led by contractor (Photograph: Ashley Basil).

4.1.13. Control of creeping water primrose

Creeping water primrose was discovered growing in Round Pond at Breamore Marsh SSSI during August 2009 and the Project Officer arranged for herbicide treatment to be undertaken using Roundup Pro-Biactive in October of that year.

In May 2010 Jo Gore joined the NFNNPP as a Project Officer and organised three applications of herbicide treatment and led a volunteer work party to hand-pull creeping water primrose plants in 2010. Further herbicide treatments and a volunteer work party were organised in 2011.

During May 2012 'Source to Sea' was set up as a collaborative project with Wiltshire Wildlife Trust to stop the spread of invasive non-native plants in the River Avon catchment. Jo worked as a Field Officer with the Source to Sea project and organised further work to control the creeping water primrose at Breamore Marsh through Source to Sea. Since then, work has continued through the NFNNPP and further details are provided in the case study at section 5.4 of this report.

4.1.14. Control of pickerel weed

The NFNNPP was alerted by a volunteer to pickerel weed (Figure 15) growing in a pond on the Open Forest near Hatchet Moor car park during 2016. A contractor was commissioned to treat it with herbicide during 2017 and work continued in 2018. Although the contractor was commissioned to undertake further treatment the following year, no pickerel weed was found here during 2019.

Figure 15: Pickerel Weed in pond near Hatchet Moor car park on 24th July 2016 (Photograph: Clive Chatters).

4.1.15. Control of yellow azalea

Yellow azalea (Figure 16) was successfully treated with herbicide by a contractor on behalf of the NFNNPP at two locations on the Open Forest:-

- to the west of the A337 between Brockenhurst and Lyndhurst;
- close to the entrance to 'Graham Lodge' near Linwood.

Figure 16: Yellow azalea on the Open Forest to west of A337 photographed on 25th May 2019.

4.1.16. Control of golden club

During April 2016 the NFNNPP was alerted by an ecological consultant to golden club (Figure 17) growing on the Open Forest at SU 212 177 in a pond near Turf Hill car park. A contractor was commissioned to undertake herbicide treatment to control the golden club during 2016, 2017, 2018 and 2019. Although the population has been substantially reduced, further work will be required in 2020.

Figure 17: Golden club photographed 7th May 2016 (Photograph: Clive Chatters).

4.1.17. Control of variegated yellow archangel

In 2018 the NFNNPP commissioned a contractor to control variegated yellow archangel (Figure 18) at the following locations:

- along fence on edge of Inclosure at SU 32608 10985;
- on Pennington Common at SZ 29904 95670.

Further work was undertaken at Pennington Common in 2019 and although NFNNPP commissioned the contractor to undertake treatment, if required, along the edge of the Inclosure, none was found here during 2019.

Figure 18: Variegated yellow archangel photographed on 29th March 2017.

4.1.18. Control of sheep laurel

The NFNNPP commissioned a contractor to control sheep laurel on the Open Forest near Ashurst Lodge during 2019 using a glyphosate-based herbicide.

4.1.19. Control of Gaultheria

The NFNNPP commissioned a contractor to control gaultheria (Figure 19) using a glyphosate-based herbicide on the Open Forest south of Rhinefield during 2019. Two treatments were undertaken as recommended by the advice written by Dr Ian Willoughby, Dr Jack Forster and Dr Victoria J Stokes and published by Forest Research in May 2016 (Willoughby, Foster and Stokes, 2016).

Figure 19: Gaultheria photographed on 25th November 2018 (Photograph: Clive Chatters).

4.1.20. Control of Cotoneaster

The NFNNPP began work to control cotoneaster (Figure 20) on the former WWI airfield at East Boldre and the former WWII airfield at Beaulieu Heath during 2016. Four species of Cotoneaster are known to occur here, namely wall cotoneaster *Cotoneaster horizontalis*, Himalayan cotoneaster *C. simonsii*, spreading cotoneaster *C.divaricatus* and Diels' cotoneaster *C.dielsianus*. The first two of these species are on Schedule 9 of the Wildlife and Countryside Act 1981.

Since then work has continued at these two sites and has been undertaken at a number of other sites on the Open Forest including the WWII airfield at Stoney Cross, land near Bramble Hill Hotel, land in the vicinity of the A31 near Slufters, land at the eastern end of Lyndhurst, land at Crockford, land at Greenmoor near Pilley, a plant growing in a thrown-open Inclosure near Acres Down and a plant growing along an Inclosure fence at Burley. The work has been undertaken by contractor using approved glyphosate-based herbicide.

Figure 20: Wall cotoneaster photographed on 15th November 2017 at Beaulieu Heath.

4.1.21. Control of periwinkle, golden rod and spiraea

The NFNNPP commissioned a contractor to control periwinkle, golden rod and spiraea on Pennington Common during 2018 and 2019.These plants had presumably all become established here due to dumping of garden waste. The treatment work was funded by the Higher Level Stewardship agreement for Pennington Common.

4.2. Control Undertaken by Volunteers

4.2.1. Control of Himalayan balsam

Volunteers have played a very important role in the control of Himalayan balsam since the start of the Project in 2009. Himalayan balsam has relatively short roots and is easy to pull up, making it an enjoyable and satisfying activity. Volunteer work parties (Figure 21) have been held on the following watercourses:

- The Cadnam River
- The Lymington River
- The Passford Water (a tributary of the Lymington River)
- The Mill Lawn Brook (a tributary of the Lymington River)
- The Avon Water
- The Beaulieu River
- The tributaries of The River Avon including Ditchend Brook, Linbrook, Dockens Water
- The Fleet Water

Figure 21: Himalayan balsam-pulling appeals to a wide range of people and ages; it requires no equipment or particular skills apart from the ability to recognise it.

4.2.2. Control of orange balsam

Volunteers have helped to control orange balsam (Figure 22) in the vicinity of the Fleet Water near Minstead during 2018 and 2019. Orange balsam was first discovered growing here during a Himalayan balsam pull at Mill Lane Farm in autumn 2018; the plants were pulled up by hand.

Figure 22: Orange balsam photographed on 27th September 2018.

4.2.3. Control of pitcher plants

Volunteers have removed pitcher plants during work parties led by the Project Officer at the following locations:

- Holmsley Bog
- Acres Down
- Matley
- East of Wootton Bridge
- Two Bridges Bottom

Small plants have been removed by hand; larger plants have required a trowel or spade. Following removal of mature plants, subsequent activity has focussed on removal of seedlings and small plants.

Further details about the control of pitcher plants at Holmsley Bog are given in section 5.3 of this report.

4.2.4. Control of floating pennywort

The Project Officer was alerted to the presence of floating pennywort (Figure 23) at Holbury Manor Ponds during early 2014. The ponds are owned by Fawley Parish Council. The Project Officer visited the ponds with representatives of the Parish Council on 13th February 2014 to discuss possible methods of control. The Parish Council decided to organise volunteers to remove the floating pennywort by hand.

Figure 23: Floating pennywort at Holbury Manor Ponds on 13th February 2014.

4.2.5. Control of pink purslane

Pink purslane (Figure 24) has become established in a number of woodlands in the New Forest area, including wet woodland habitats along the Passford Water and the Beaulieu River. One of Forestry England's Voluntary Rangers helped the Project Officer dig up the pink purslane from the woodland to the west of the Beaulieu River during July 2019.

Figure 24: Pink purslane photographed in wet woodland to the west of the Beaulieu River on 5th July 2019.

4.2.6. Control of American skunk cabbage

The Project Officer gave advice to the owner of 'The Pheasantry', Lower Sandy Down near Boldre during 2009 regarding control of American skunk cabbage growing in wet woodland along a tributary of the Lymington River; as further work was required, the NFNNPP led two volunteer work parties during 2019 to dig up a substantial population of American skunk cabbage plants at this location. Volunteers have also helped dig up isolated America skunk cabbage plants at a few other locations in the vicinity of the Lymington River.

4.3. Control Undertaken by Project Officer

4.3.1. Control of Venus fly trap

During 2014 the New Forest National Park Authority alerted the Project Officer to the presence of Venus fly trap *Dionaea muscipula* (Figure 25) growing to the west of Burley. Two clumps were removed by the Project Officer using a hand trowel at SU 19292 03892 on 30th September 2014.

Figure 25: Venus fly trap plants were dug up by the Project Officer during September 2014.

4.3.2. Control of three-cornered garlic

During 2016 the Project Officer noticed that three-cornered garlic had become established along the verge of Fletchwood Lane, near Totton. Digging commenced during May 2016 and control work continued during 2017 and 2018. By 2019 the work undertaken at this site appeared to have been successful.

4.3.3. Control of floating pennywort

During autumn 2017 the Project Officer was contacted by a local resident who reported a sighting of floating pennywort growing in the Cadnam River. On 3rd November 2019 the Project Officer contacted the relevant landowner who understood the importance of a rapid response and offered to help with its removal. The Project Officer and the landowner met later that day and carefully removed the plants. The Project Officer then sent an identification sheet and advisory note to all relevant landowners on the Cadnam River to ask them to alert her if they found floating pennywort or any plants which they thought might be floating pennywort. Further details are given in section 5.5 of this report.

5. EXAMPLES OF THE EFFECTIVENESS OF CONTROL WORK

5.1. The Beaulieu River as an Example of Successful Control of Himalayan Balsam

Hand-pulling by volunteers has resulted in a large decrease in Himalayan balsam along watercourses in the New Forest area. The impact of volunteer activity can be demonstrated by this case study relating to the Beaulieu River where the population of Himalayan balsam on the Open Forest downstream of Ipley Manor has been mapped since the start of the Project in 2009.

5.1.1. Description of the Beaulieu River and its Catchment

The Beaulieu River (Figure 26) rises at Lyndhurst and flows through Crown Land (the land managed by Forestry England) across heathland, grassland and woodland habitats on the Open Forest i.e. the area grazed by New Forest commoners' cattle and ponies. In places the Beaulieu River flows through privately-owned fields before resuming its course across the Open Forest. It then flows through the privately-owned Beaulieu Estate before entering the Beaulieu Estuary.

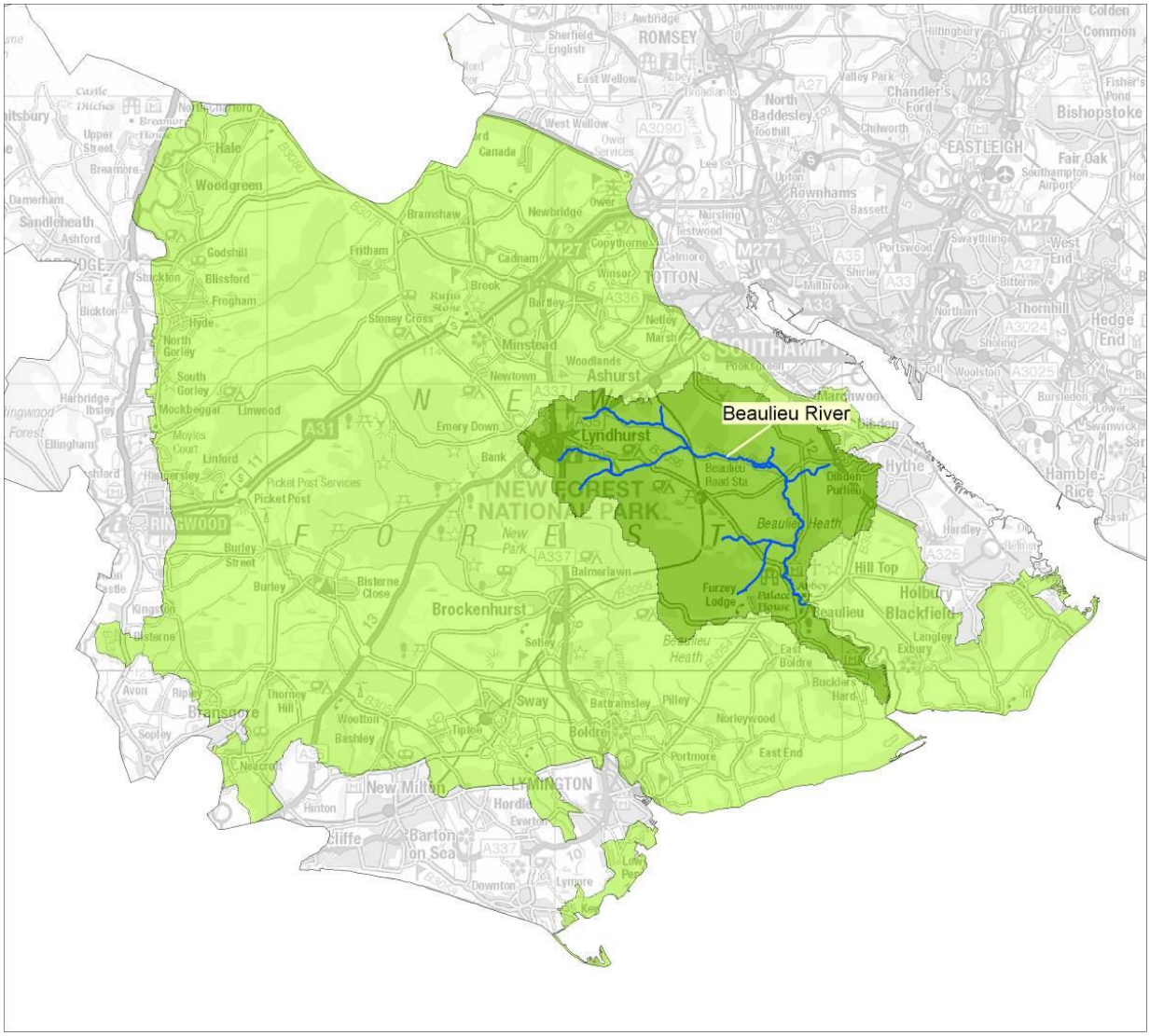

Figure 26: The location of the Beaulieu River and its catchment in the New Forest.

5.1.2. The ecological importance of the Beaulieu River

The Beaulieu River is recognised as being of high ecological quality and has a number of statutory nature conservation designations.

The Beaulieu River flows through the New Forest SSSI. The lower part of the Beaulieu River flows through the North Solent SSSI and the North Solent National Nature Reserve (NNR).

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The catchment of the Beaulieu River includes land within:

- The New Forest Special Area of Conservation (SAC) designated under the Habitats Directive (Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora)
- The New Forest Special Protection Area (SPA) designated under the Birds Directive (Directive 79/409/EEC on the Conservation of Wild Birds)
- The New Forest Ramsar Site (an international designation denoting wetlands of international importance).

5.1.3. Himalayan Balsam within the catchment of the Beaulieu River

Himalayan balsam is known to have been present within the catchment of the Beaulieu River since 1986 (Julie Thomas *pers. comm.*).

By the time the New Forest Non-Native Plants Project started in May 2009, Himalayan balsam was known to occur at Lyndhurst in the vicinity of the source of the Beaulieu River; on privately-owned land in the grounds of Ipley Manor; on the Open Forest on Crown Land downstream of Ipley; on privately-owned land within the Beaulieu Estate.

Himalayan balsam occurred in significant quantities on the Open Forest of the Crown Land downstream of Ipley, despite this area being theoretically accessible to Commoners' grazing animals, because the woodland fringing this section of the Beaulieu River is extremely wet in places and very difficult for ponies and cattle to access.

5.1.4. The control of Himalayan balsam along the Beaulieu River

During 2009 the Project Officer ascertained where the balsam occurred along the Beaulieu River and who owned/managed the land.

The balsam population near the source of the Beaulieu River at Lyndhurst was being controlled by the Forestry Commission's Voluntary Rangers and Two Trees Conservation Team volunteers. The balsam population within the North Solent National Nature Reserve was controlled by the NNR volunteers with help from the Forestry Commission's volunteers.

The landowner of Ipley Manor informed the Project Officer that he had utilised a range of techniques to control Himalayan balsam on his land (including hand-pulling, grazing, cutting, herbicide treatment) and was confident that he would be able to eradicate Himalayan balsam from his property. He informed the Project Officer that no balsam occurred further upstream on the privately-owned land at Decoy Pond Farm.

The Project Officer ascertained that the balsam population did not extend downstream of the village of Beaulieu, probably as a result of the saline influence downstream of Beaulieu Mill Pond.

The Project Officer therefore decided to focus effort on the section of the Beaulieu River on Crown Land on the Open Forest downstream of Ipley where the Forestry Commission's volunteers had already undertaken some hand-pulling. This section of the Beaulieu River is the subject of this case study.

The Project Officer liaised with the Forestry Commission and has led volunteer work parties here each year since 2010 when work parties were held on 28th May and 19th July.

The Project Officer recognised the value of having a 'river champion' to lead small groups of volunteers to 'patrol' the Beaulieu River in late summer/autumn and pull any balsam plants which might have been missed during volunteer work parties earlier in the season. Following a request for a river champion, two people volunteered to fulfil this role. The Trust took responsibility for health and

safety and insurance cover for the river champions and the people who would be volunteering with them. The Trust paid for the river champions to undertake training in outdoor first aid and lent them first aid kits and emergency throw-lines. They attracted a keen group of people who volunteered to 'patrol' the Beaulieu River with them in small teams during the summer and autumn of 2012.

5.1.5. Impact of volunteer activity along the Beaulieu River

During 2009 University of Southampton graduates, Simon Kain and Phil Latto, volunteered on behalf of the New Forest Non-Native Plants Project to map the distribution of Himalayan balsam on the Open Forest downstream of Ipley to the boundary between the Crown Land and the Beaulieu Estate at 'North Gate' as indicated in Figure 27.

The results of their research are contained in their un-published report titled 'Non-native invasive plant species in the New Forest National Park' (Kain & Latto, 2010).

Simon Kain and Phil Latto found a 'very large amount' of Himalayan balsam at a total of 31 sites. Seven of these sites were groups of five or fewer balsam plants; the remaining stands ranged widely in size "in some cases containing an estimated 3,000 individual plants. Six stands were estimated to contain over 1,000 individuals, while some patches were estimated to be hundreds of square metres in size. Himalayan balsam dominated the majority of the river corridor, with some individuals measuring over 3.5 metres in height" (Figure 28)

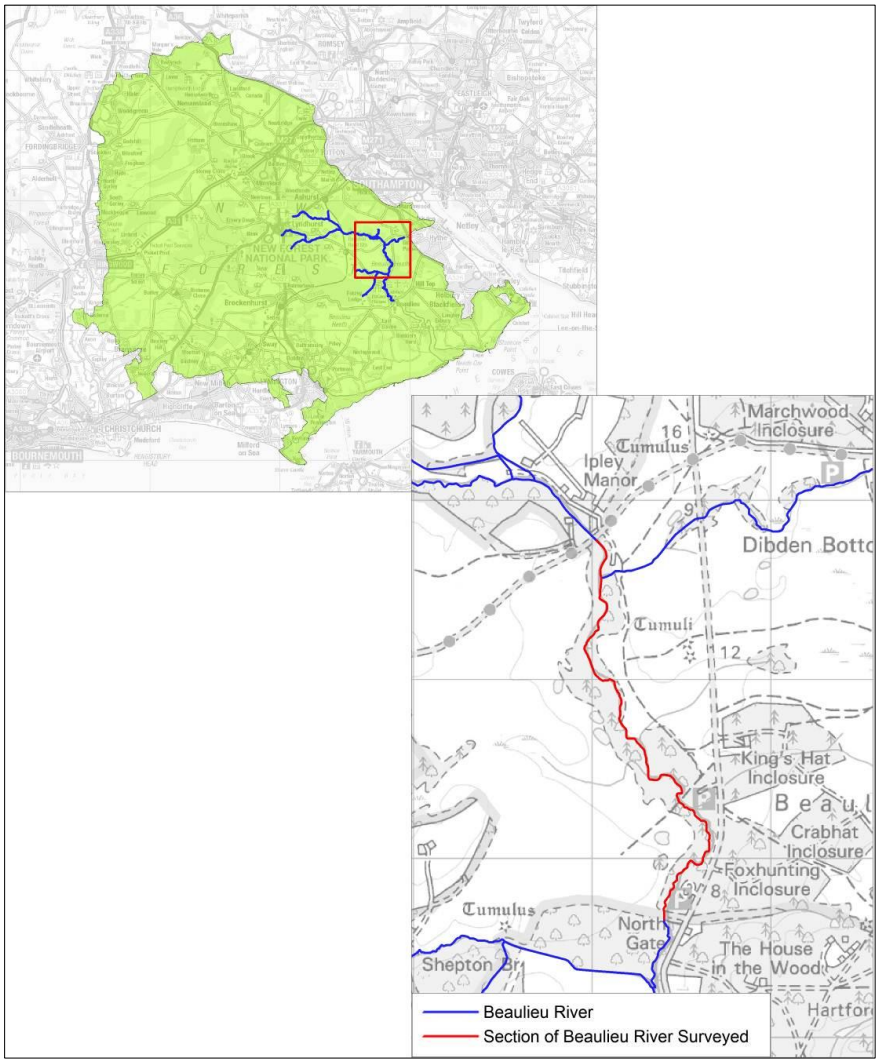


Figure 27: Section of Beaulieu River which was surveyed by University of Southampton graduates Simon Kain and Phil Latto during 2009.

During 2010 University of Southampton graduates Athene Gadsby and Thomas Fox volunteered to help the New Forest Non-Native Plants Project and surveyed a number of watercourses on 'Crown Land' in the New Forest, including the equivalent section of the Beaulieu River that was surveyed by Simon Kain and Phil Latto in 2009. The results of Tom and Athene's research are contained in the un-published report titled 'Non-native invasive plant species in the New Forest National Park 2010 report' dated September 2010 (Gadsby & Fox, 2010).

On 11th August 2010 Athene Gadsby and Thomas Fox surveyed the Beaulieu River. They recorded Himalayan balsam at nine sites, four of which contained fewer than 21 plants. There were two large sites, one containing upwards of 100 plants and the other containing more than 400 plants. The balsam plants in the smaller sites were pulled-up by the surveyors and some plants in the larger patches were also pulled by Tom and Athene. The large area of over 400 plants contained many small plants; most were smaller than 1 metre and few of them were flowering. The plants in smaller stands were upwards of 2 metres in height and flowering, often located on islands in the river or growing amongst fallen trees (Figure 29).

Tom and Athene observed that extensive management had taken place. Plenty of evidence of balsam pulling was seen across the southern section of the Beaulieu River. Regardless of this management, Himalayan balsam was recorded in this 2010 survey along almost exactly the same length of river as the previous year. In 2010 however far fewer balsam plants were present indicating that management had a positive effect (Gadsby & Fox, 2010).

On 20th September 2012, volunteer John Moore accompanied the Project Officer to undertake a survey of the Himalayan balsam remaining along this section of the Beaulieu River following the volunteer work parties to pull balsam during summer 2011 and summer 2012. A total of 198 plants were recorded. The largest stands contained 55 and 51 plants respectively; three stands contained between 10 and 20 plants; the majority of stands (16 stands) contained fewer than 10 plants. This survey revealed that the time spent by volunteers pulling balsam during summer 2011 and the 90 hours of balsam-pulling by volunteers during summer 2012 along this section of the Beaulieu River had a very noticeable impact on the Himalayan balsam population since the previous survey undertaken on 11th August 2010 (Figure 30).

Further hand-pulling of Himalayan balsam was scheduled to occur along this section of the Beaulieu River during summer 2013. However, as there had been such a substantial decrease in the balsam population, the Project Officer agreed with the Forestry Commission that it would be inappropriate to organise groups of 'Two Trees Conservation Team' volunteers as there were likely to be insufficient plants to justify a group of that size. Instead, the Project Officer led very small work parties involving two Voluntary Rangers on 17th June and 15th July 2013.

During these work parties held in 2013, GPS (Global Positioning System) readings were taken at each location where Himalayan balsam was found and the number of plants was recorded. A total of 305 Himalayan balsam plants were recorded (Figure 31). Although this is a higher total than the number recorded in September 2012, the survey in 2012 was undertaken *after* the work parties had been held, whereas the results from 2013 indicate the number of plants pulled up *during* the work parties.

During 2014 the Project Officer led two Forestry Commission Voluntary Rangers to pull Himalayan balsam on 16th June and 14th July. A total of 143 plants were pulled up. The majority (136 plants) were found at a single location on 14th July. Of the remainder, four plants were pulled up at a single location on 16th June and three plants were pulled up at a single location on 14th July (Figure 32).

During 2015 the Project Officer led two Forestry Commission Voluntary Rangers to pull Himalayan balsam on 25th June and 7th July. A total of 594 plants were pulled up. The majority (559 plants) were found along the west bank on 7th July. All the remaining plants were found on the east bank on 25th June (Figure 33).

Two volunteer work parties were scheduled during 2016 but one had to be cancelled due to an unfavourable weather forecast predicting high winds; it was considered too dangerous to be working under trees that day. A volunteer work party was held on 8th July when a total of 443 plants were pulled up, 49 on the east bank and 394 on the west bank (Figure 34).

During 2017 the Project Officer led two Forestry Commission Voluntary Rangers to pull Himalayan balsam on 22nd June and 21st July. A total of 56 plants were pulled up (Figure 35).

During 2018 the Project Officer led two Forestry Commission Voluntary Rangers to pull Himalayan balsam on 21st June and 20th July. A total of 3,246 plants were pulled up. The majority (3,175) of these plants were growing to the west of the river in an area which the Project Officer had assumed was clear of balsam since the plants were pulled there in 2013. When this area was re-visited in 2018 the Project Officer realised that it had been unwise to assume that the balsam had been eradicated from this particular area. This highlights the need for regular monitoring and to remain vigilant (Figure 36).

During 2019 the Project Officer led two Forestry Commission Voluntary Rangers to pull Himalayan balsam on 25th June and 19th July. A total of 10 plants were found. All these plants were growing in the area where 3,175 plants had been pulled up in 2018 (Figure 37). This demonstrates that thorough hand-pulling can be extremely effective. This area will be thoroughly checked during 2020.

5.1.6. Conclusions

The following maps (Figure 28 – Figure 37) demonstrate that hand-pulling by volunteers during the ten years between 2010 and 2019 has been a very effective method of controlling Himalayan balsam along this section of the Beaulieu River. The Project Officer is confident that, with sustained effort and monitoring, complete eradication of Himalayan balsam can be achieved.

This case study also demonstrates the importance of monitoring and the need to return to sites for a number of years to ascertain whether control work has been effective.

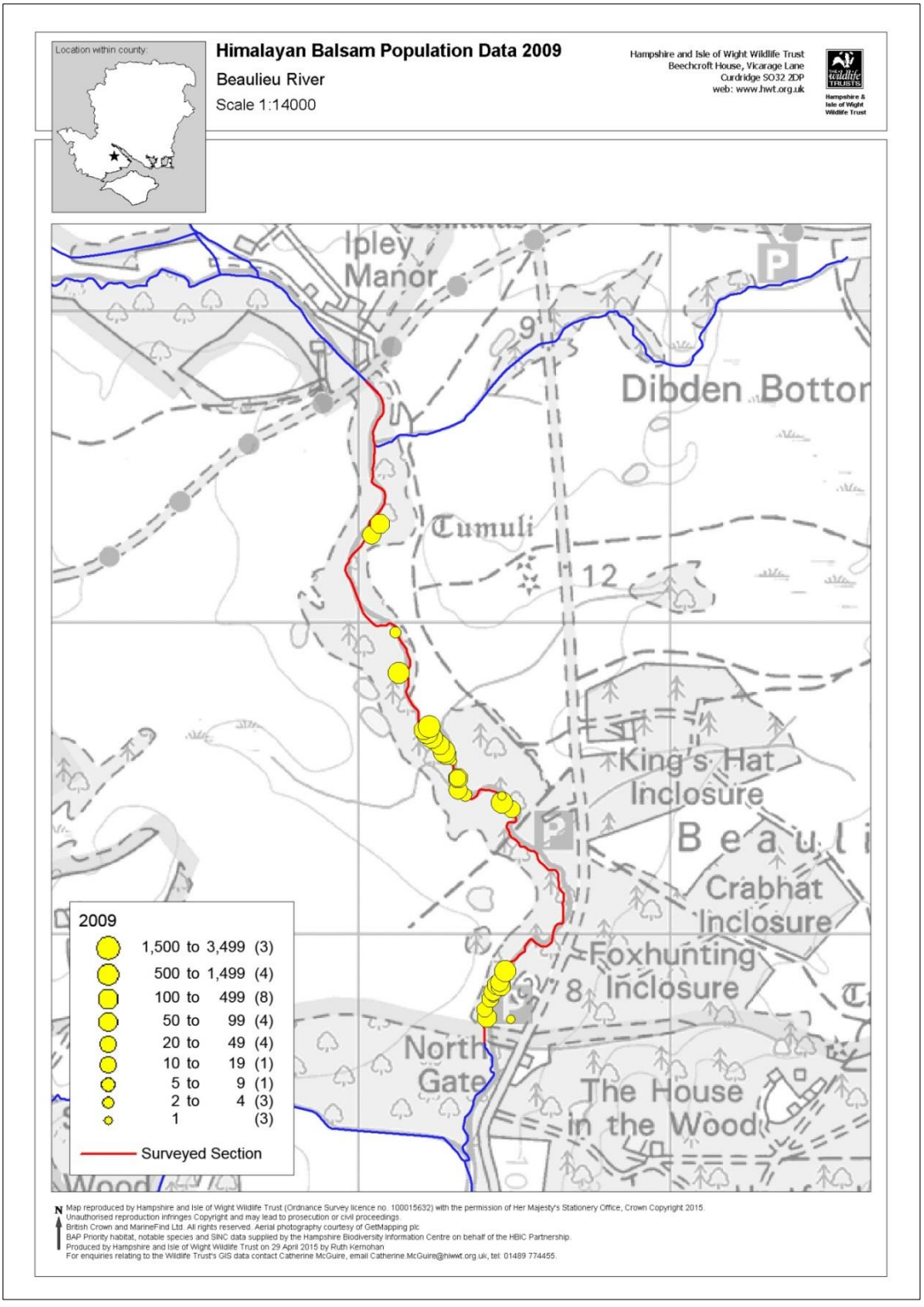


Figure 28: Himalayan balsam plants recorded along a section of the Beaulieu River by volunteers Simon Kain and Phil Latto during 2009.

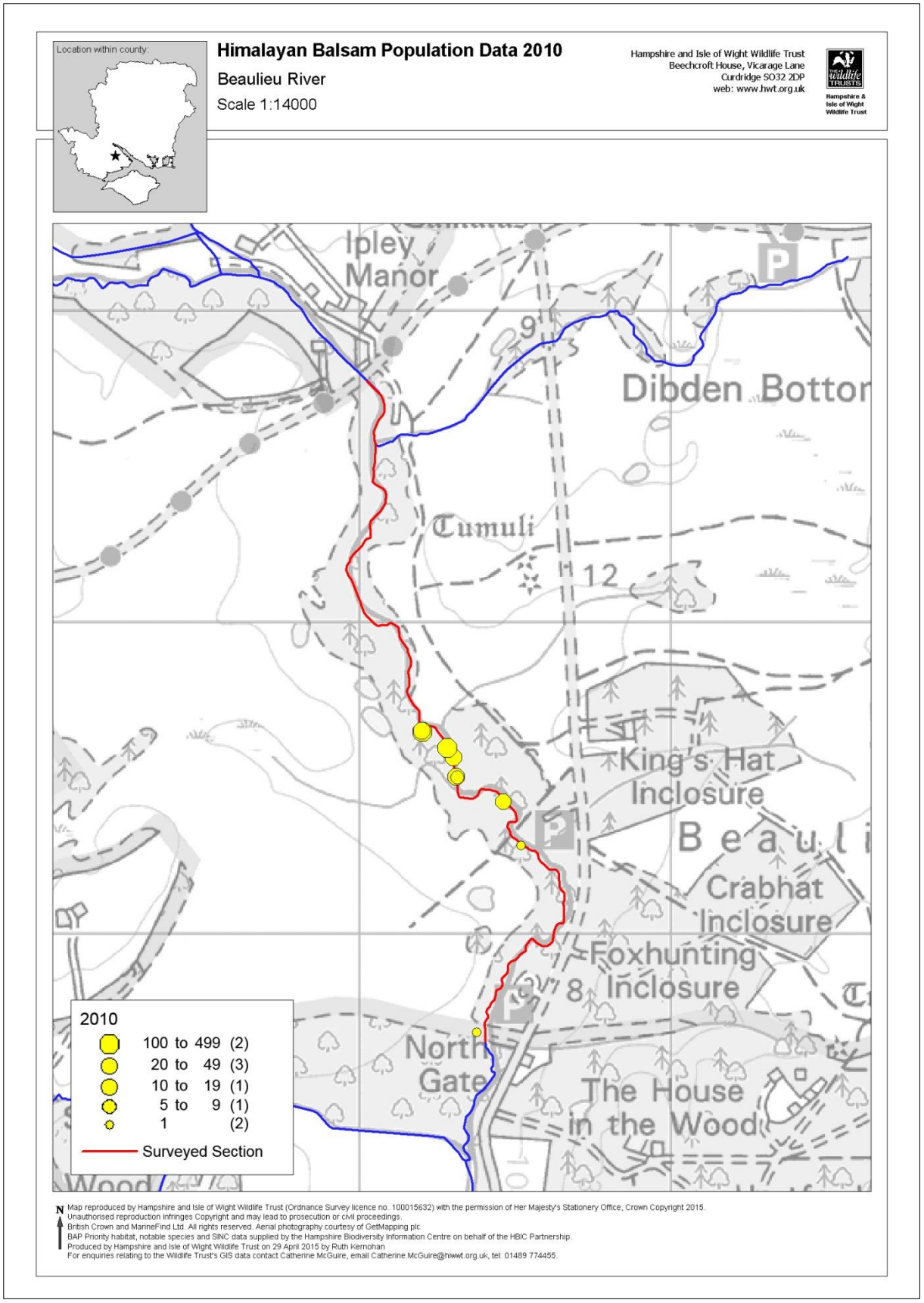


Figure 29: Himalayan balsam plants recorded along the Beaulieu River by volunteers Athene Gadsby and Tom Fox during August 2010.

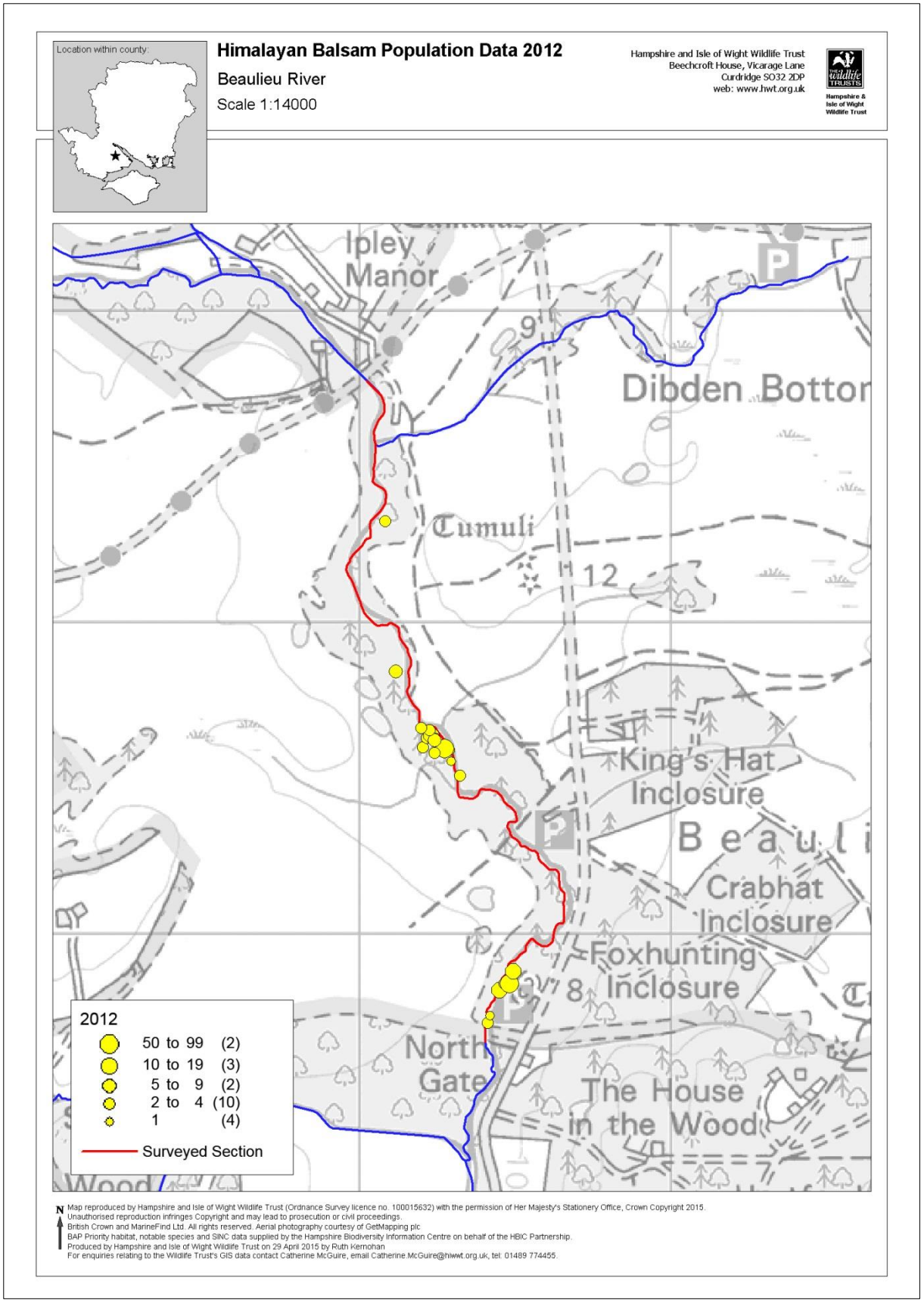


Figure 30: Himalayan balsam plants recorded along the Beaulieu River by volunteer John Moore and the New Forest Non-Native Plants Officer during September 2012.

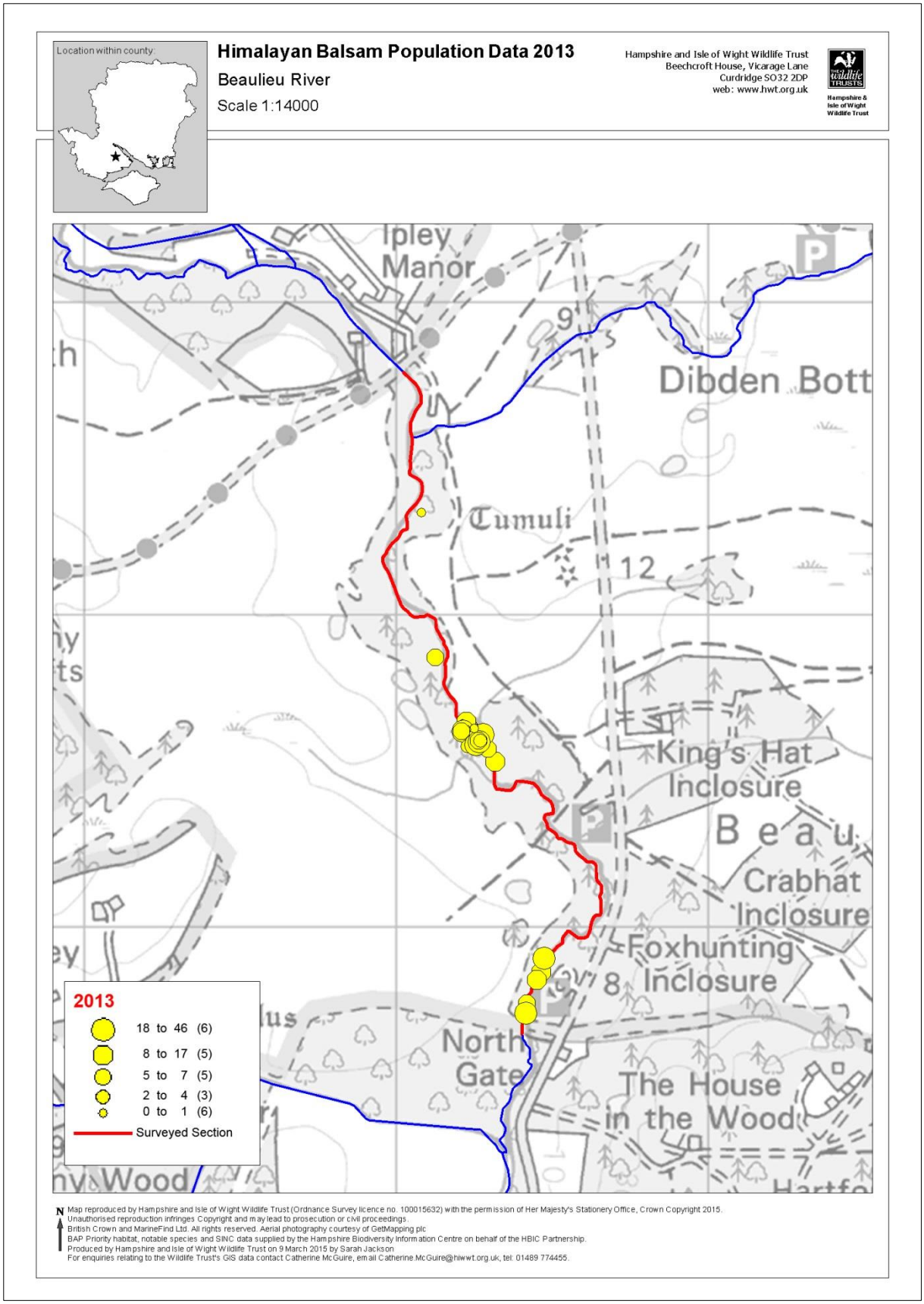


Figure 31: Himalayan balsam plants recorded along the Beaulieu River by Forestry Commission Voluntary Rangers and the New Forest Non-Native Plants Officer during balsam pulls held on 17th June and 15th July 2013.

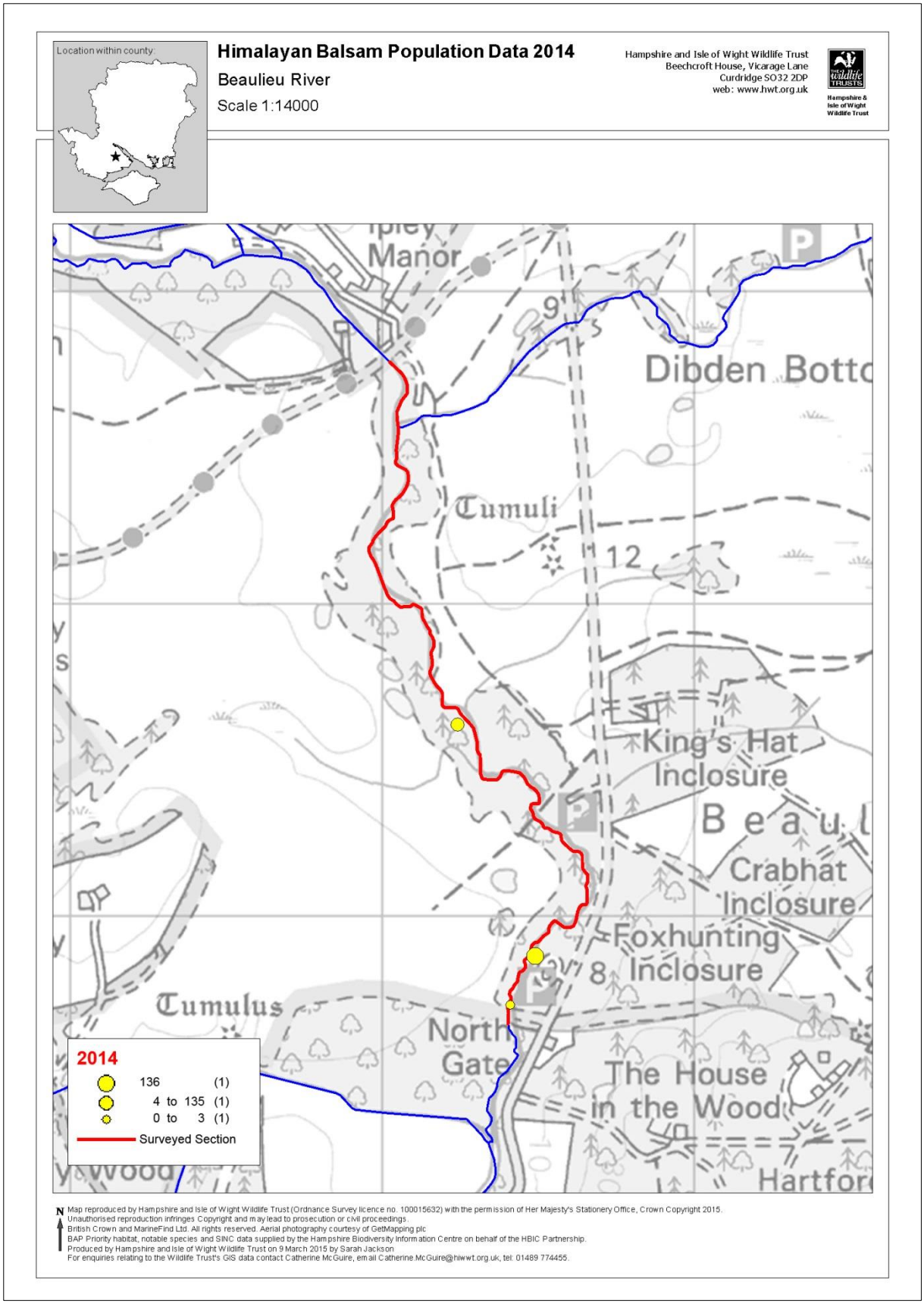


Figure 32: Himalayan balsam plants recorded along the Beaulieu River by Forestry Commission Voluntary Rangers and the New Forest Non-Native Plants Officer during balsam pulls held on 16th June and 14th July 2014.

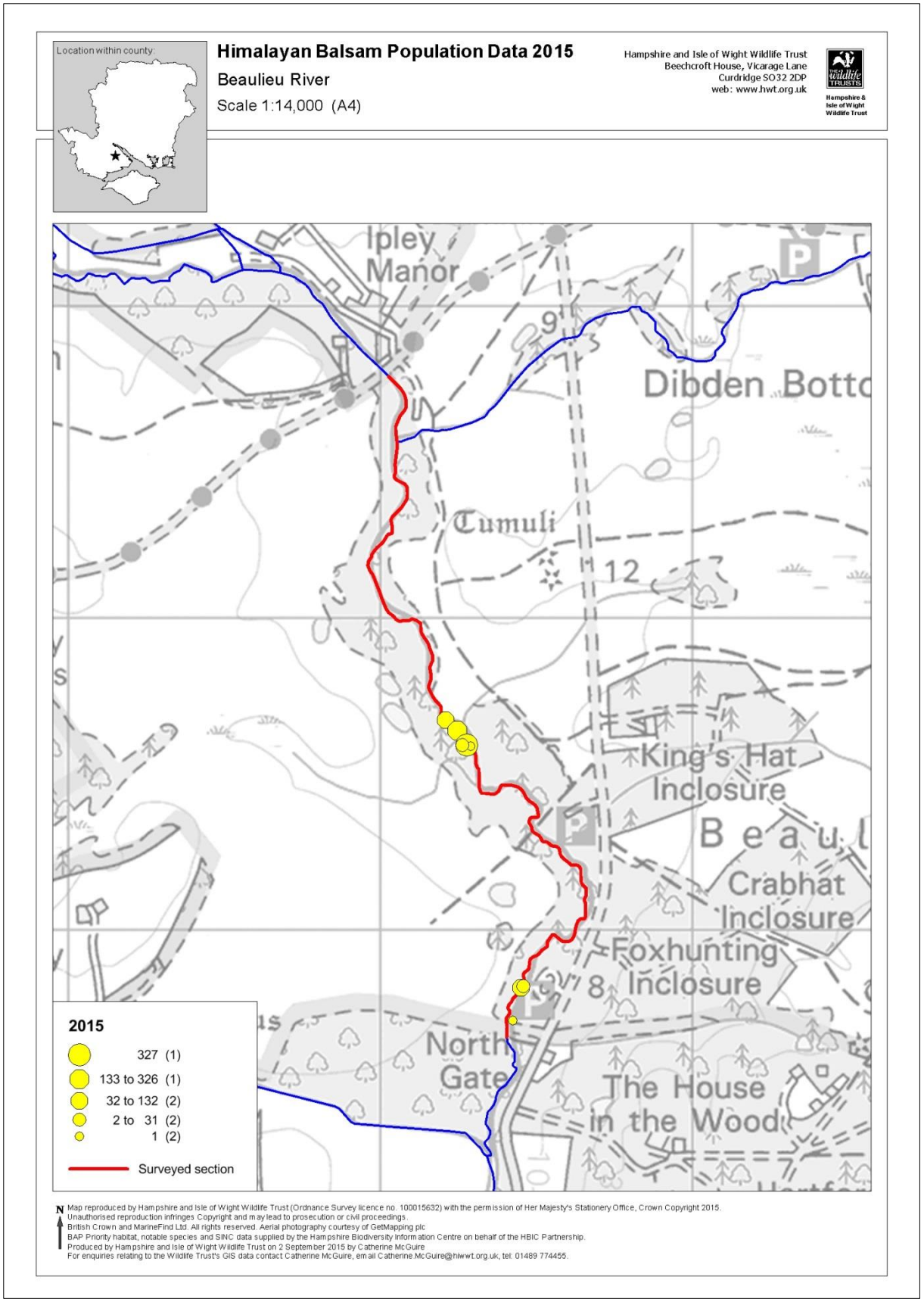


Figure 33: Himalayan balsam plants recorded along the Beaulieu River by Forestry Commission Voluntary Rangers and the New Forest Non-Native Plants Officer during balsam pulls held on 25th June and 7th July 2015.

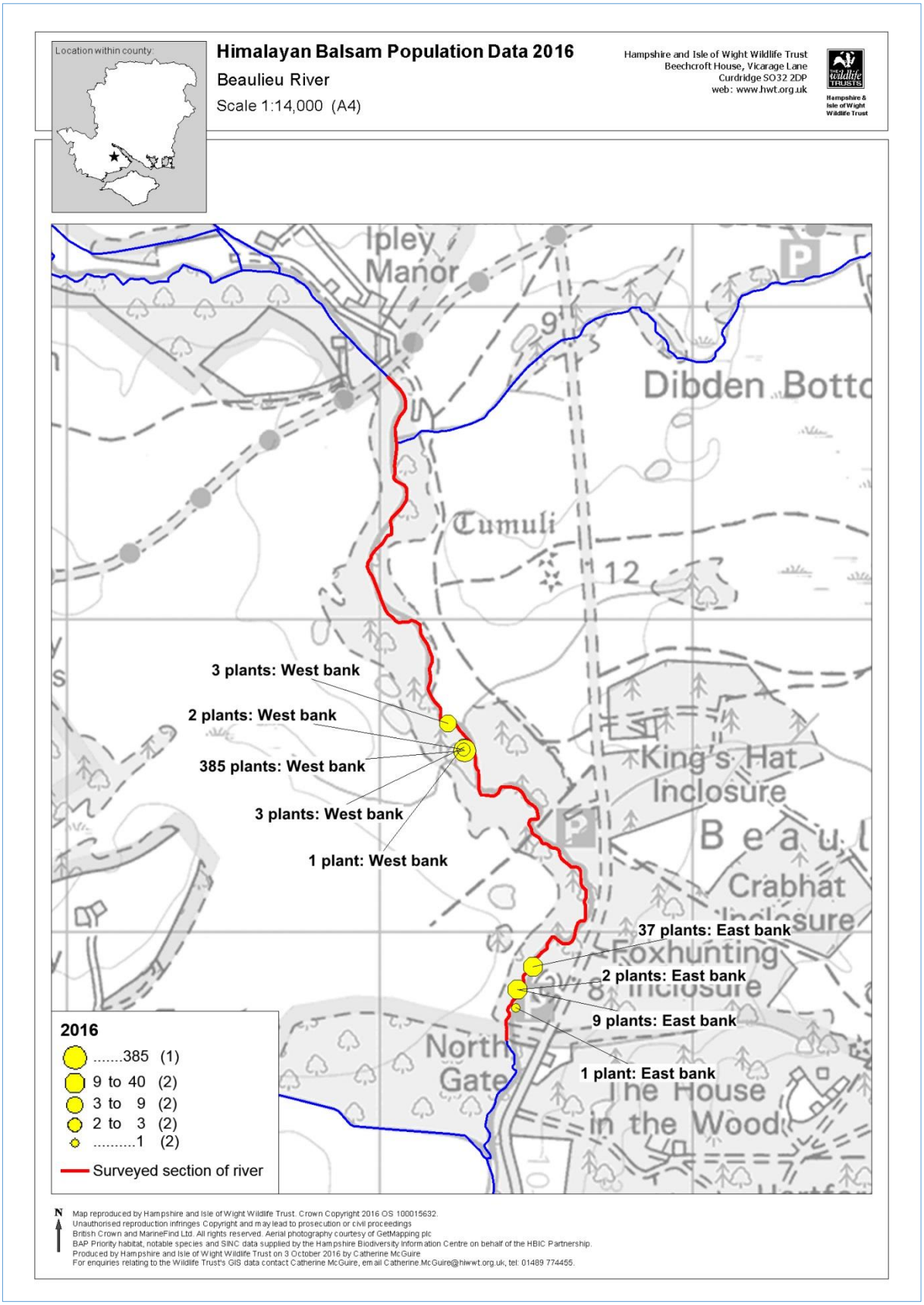


Figure 34: Himalayan balsam plants recorded along the Beaulieu River by Forestry Commission Voluntary Rangers and the New Forest Non-Native Plants Officer during balsam pull held on 8th July 2016.

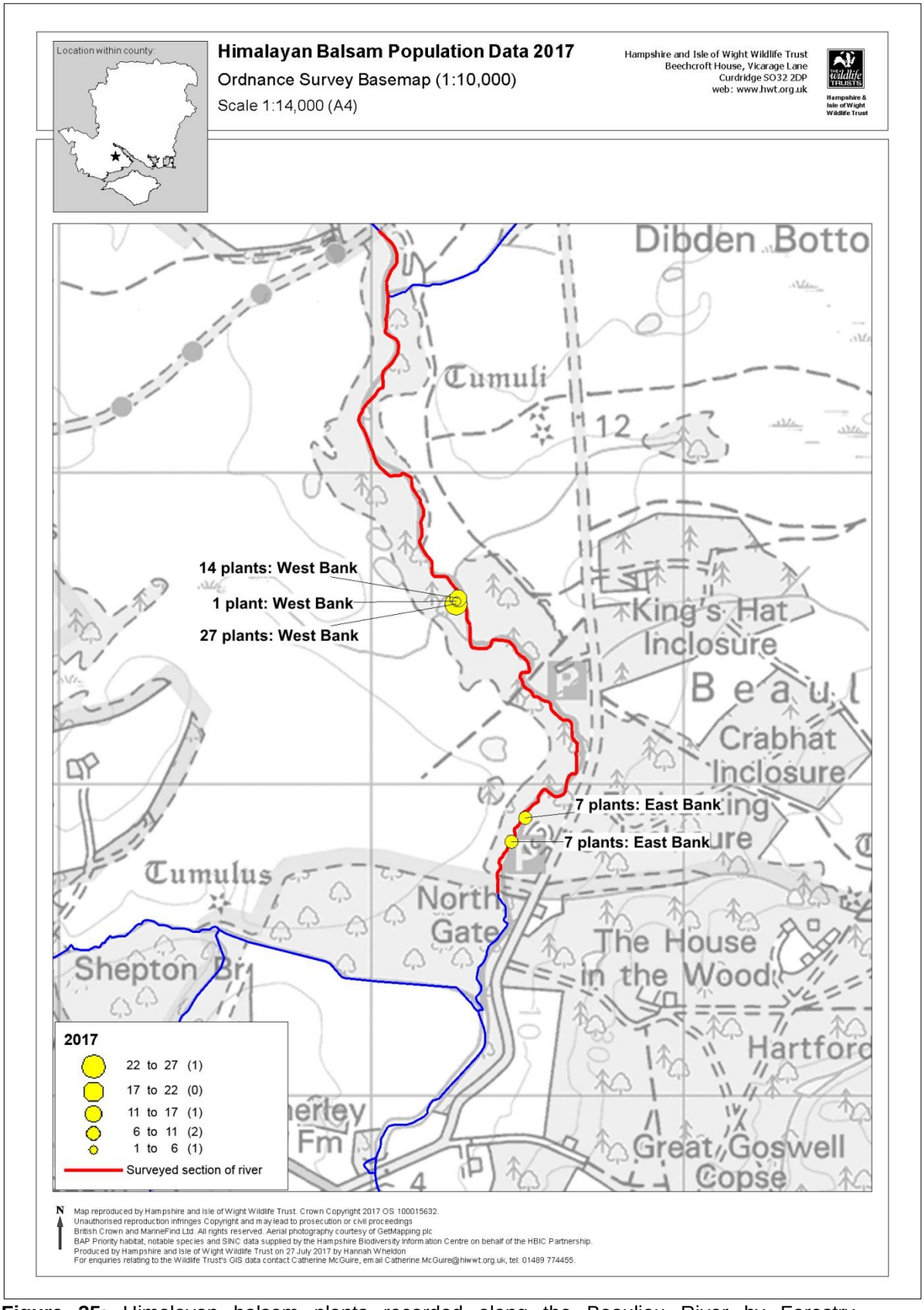


Figure 35: Himalayan balsam plants recorded along the Beaulieu River by Forestry Commission Voluntary Rangers and the New Forest Non-Native Plants Officer during balsam pulls held on 22nd June and 21st July 2017.

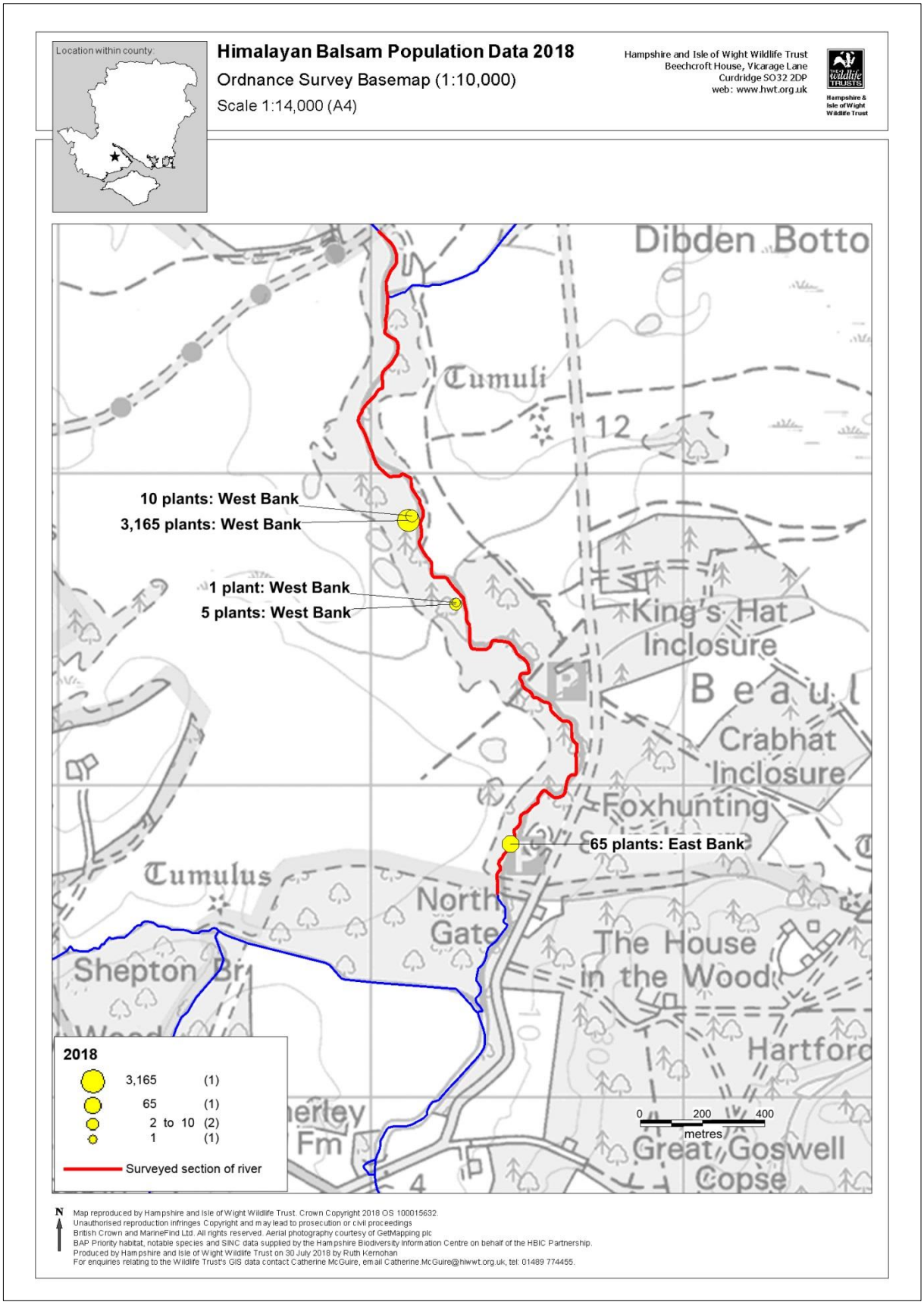


Figure 36: Himalayan balsam plants recorded along the Beaulieu River by Forestry Commission Voluntary Rangers and the New Forest Non-Native Plants Officer during balsam pulls held on 21st June and 20th July 2018.

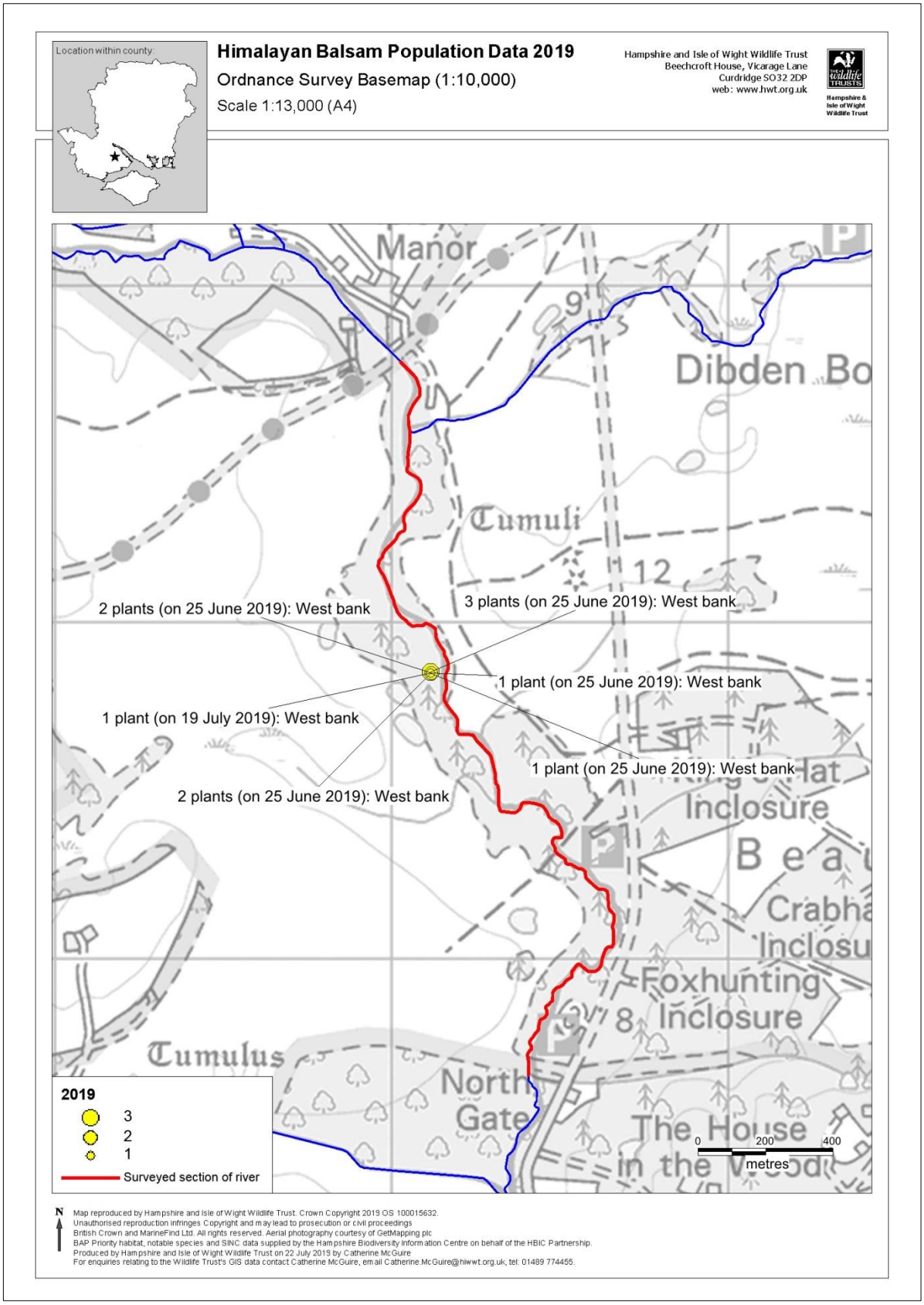


Figure 37: Himalayan balsam plants recorded along the Beaulieu River by Forestry England Voluntary Rangers and the New Forest Non-Native Plants Officer during balsam pulls held on 25th June and 19th July 2019.

5.2. The Lymington River as an Example of Successful Control and Colonisation

Herbicide treatment undertaken on behalf of the NFNNPP has resulted in a large decrease in American skunk cabbage in wet woodlands in the New Forest and subsequent colonisation by native vegetation. This case study relates to the impact of the control of American skunk cabbage within the Trust's Lymington Reedbeds Nature Reserve where monitoring has been undertaken since 2013.

5.2.1. Description of the Lymington River and its Catchment

The Lymington River (Figure 38) is fed by a number of tributaries including the Mill Lawn Brook, the Ober Water, the Highland Water and the Passford Water. It flows through the Open Forest, privately-owned fields and woodlands and two of the Trust's nature reserves before entering The Solent at Lymington.

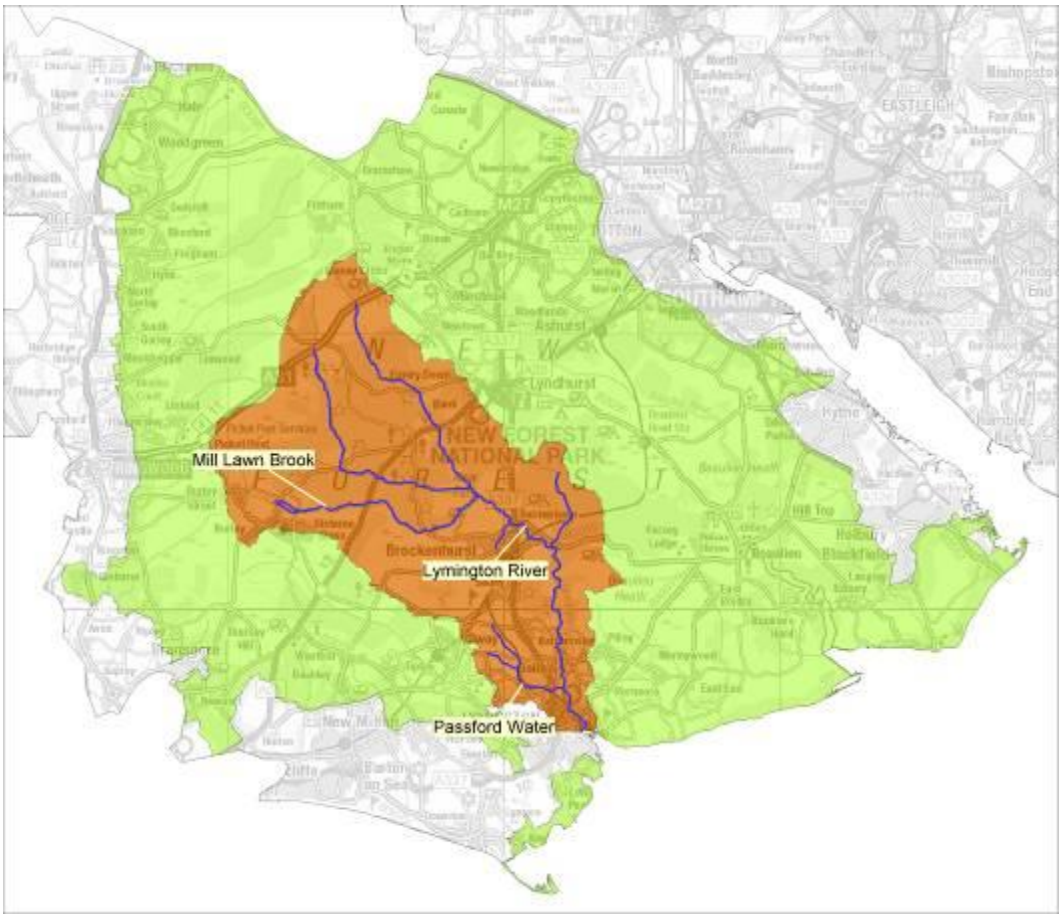


Figure 38: The location of the Lymington River and its catchment in the New Forest.

5.2.2. The ecological importance of the Lymington River

The Lymington River is recognised as being of high ecological quality and has a number of statutory nature conservation designations.

The Lymington River has been notified as a SSSI and it flows through the New Forest SSSI. The lower reaches of the Lymington River are included within the Lymington River Reedbeds SSSI and the Solent and Southampton Water SPA.

The catchment of the Lymington River includes land within:

- The New Forest Special Area of Conservation
- The New Forest Special Protection Area
- The New Forest Ramsar Site

5.2.3. American skunk cabbage within the Catchment of the Lymington River

American skunk cabbage (Figure 39) has invaded suitable habitat at a number of locations within the catchment of the Lymington River, including *inter alia* wet woodland along the Mill Lawn Brook downstream of Burley, wet woodland in the grounds of 'The Pheasantry' at Lower Sandy Down, wet woodland near Boldre Church and wet woodland within Lymington River Reedbeds SSSI including privately-owned land and the Trust's Lymington Reedbeds Nature Reserve (Figure 40).

Figure 39: American skunk cabbage within Lymington Reedbeds Nature Reserve on 22nd April 2011 (Photograph: Clive Chatters).

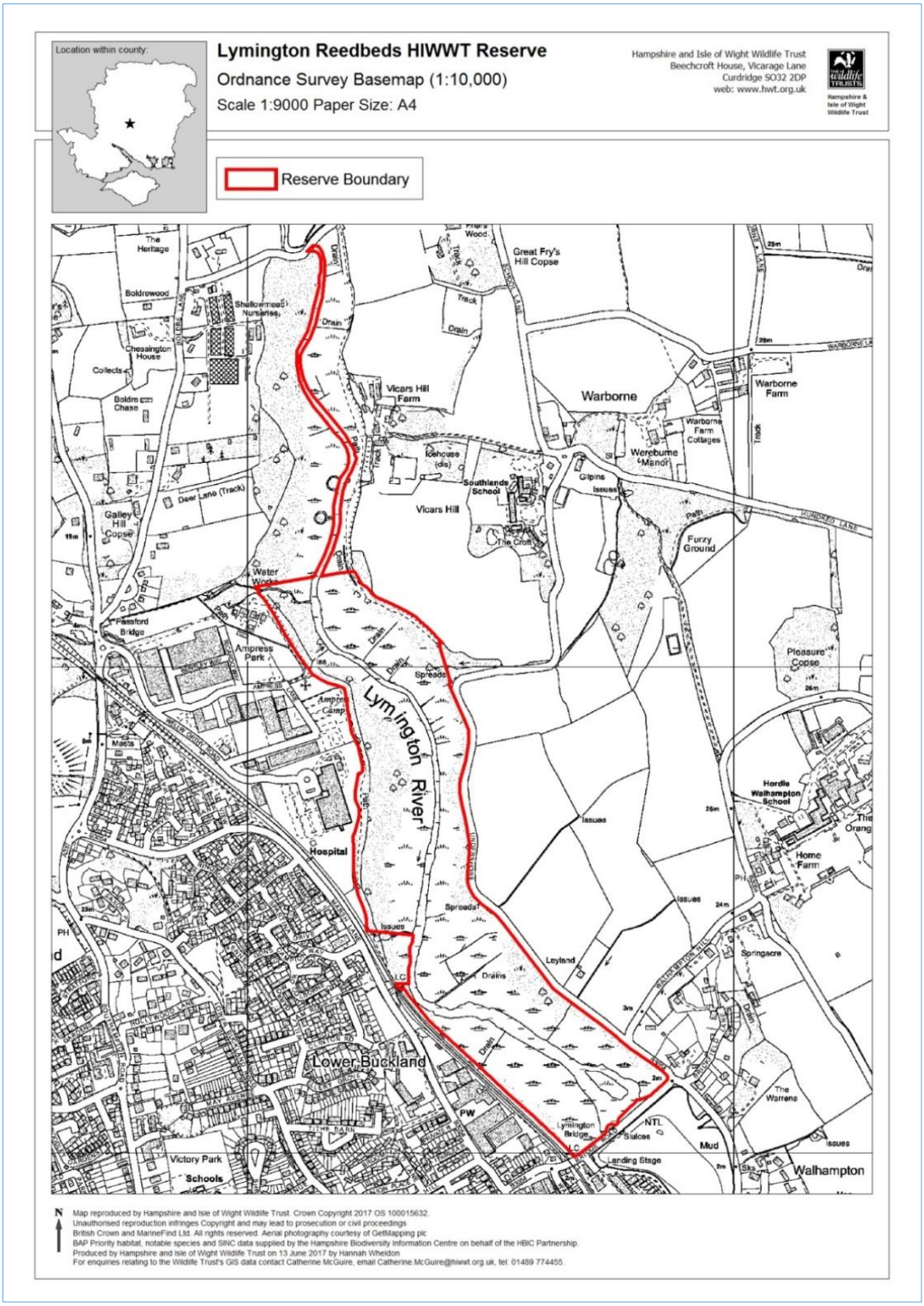


Figure 40: Lymington Reedbeds Nature Reserve, which is a component of the Lymington River Reedbeds SSSI.

Photographs taken on 14th July 2009 (Figures 41 and 42) indicate the density of the population of American skunk cabbage within the nature reserve at the start of the New Forest Non-Native Plants Project.

Figure 41: John Durnell of HIWWT photographed amongst mature American skunk cabbage plants in Lymington Reedbeds Nature Reserve on 14th July 2009.

Figure 42: Photograph taken on 14th July 2009 giving an indication of the dense population of American skunk cabbage in the Nature Reserve prior to herbicide treatment which started in 2010.

5.2.4. The control of American skunk cabbage in the nature reserve

During 2009 Oliver Wilkins helped the Project Officer to record the extent of American skunk cabbage within the Lymington Reedbeds Nature Reserve (Figure 43).

Figure 43: Oliver Wilkins recording American skunk cabbage in Lymington Reedbeds Nature Reserve.

In 2010 the NFNNPP trialled the use of two herbicides (2,4-D amine and Roundup Pro-Biactive) within the nature reserve to compare their effect on American skunk cabbage. As mentioned in section 6.3 of this report, the results of this trial were monitored by Tom Fox and Athene Gadsby whose research indicated that the glyphosate-based herbicide Roundup Pro-Biactive was more effective than 2,4-D amine (Gadsby & Fox, 2010).

Following the trial, the NFNNPP commissioned a contractor to undertake herbicide treatment of the American skunk cabbage in the nature reserve during 2011 using a glyphosate-based herbicide approved for use near water. This work has been undertaken each year up to and including 2019.

5.2.5. Monitoring the effect of the herbicide treatment

In 2013 the NFNNPP started monitoring the effect of herbicide treatment of American skunk cabbage in the Trust's Lymington Reedbeds Nature Reserve. The aim of the monitoring was to assess a) the impact of the herbicide treatment on the American skunk cabbage and b) colonisation by native plants.

On 15th April 2013 volunteer Guy Mason (Figure 44) helped the Project Officer to install six quadrats marked by red-topped wooden stakes and to record the relative abundance of American skunk cabbage, other plant species and bare ground/leaf litter. The six quadrats were located where small American skunk cabbage plants occurred, on the assumption that these had germinated since herbicide treatment had been undertaken in previous years on mature plants which had shed seed in those areas.

GPS readings (at 6 metres accuracy) were taken at each quadrat using a hand-held Garmin device:

Quadrat 1	SZ 32261 96878
Quadrat 2	SZ 32252 96542
Quadrat 3	SZ 32271 96612
Quadrat 4	SZ 32269 96662
Quadrat 5	SZ 32309 96687
Quadrat 6	SZ 32212 96963

Figure 44: Guy Mason (volunteer) photographed on 15th April 2013 recording relative abundance of vegetation in Quadrat 5 following herbicide treatment of American skunk cabbage in Lymington Reedbeds Nature Reserve.

When the quadrats were monitored on 15 April 2013, the DAFOR scale was used to assess the relative abundance of the plants within each quadrat. The DAFOR scale describes relative abundance using the terms 'dominant', 'abundant', 'frequent', 'occasional' or 'rare'. However, it became apparent that the DOMIN scale would probably give more meaningful results. The DOMIN scale relies on estimates of percentage cover as follows:

DOMIN scale

Cover	**Score**
91 – 100%	10
76 – 90%	9
51 – 75%	8
34 - 50%	7
26 – 33%	6
11 – 25%	5
4 – 10%	4
Up to 4% (many individuals)	3
Up to 4% (several individuals)	2
Up to 4% (few individuals)	1

The 6 quadrats were therefore re-surveyed by the Project Officer with volunteer Clive Chatters using the DOMIN scale on 21st April 2013.The monitoring has been repeated by the Project Officers using the DOMIN scale during 2016, 2017, 2018 and 2019. In April of each of those years the Project Officers have re-visited the six quadrats to record the relative abundance of American skunk cabbage, other plants and bare ground/leaf litter/water.

The monitoring has demonstrated a decrease in the American skunk cabbage population. During 2013 each of the six quadrats contained American skunk cabbage plants:

- Quadrat 1 contained 8 American skunk cabbage plants, 10 – 14 cm tall;
- Quadrat 2 contained 2 American skunk cabbage plants, 14 cm tall;
- Quadrat 3 contained 29 American skunk cabbage plants on average 7 cm tall (Figure 45);
- Quadrat 4 contained 6 American skunk cabbage plants, on average 7 cm tall;
- Quadrat 5 contained 25 American skunk cabbage plants, mostly 7 cm tall although one plant was 12 cm tall;
- Quadrat 6 contained 2 American skunk cabbage plants, one being 6 cm tall and one being 15 cm tall.

Figure 45: Measuring the height of American skunk cabbage seedlings in Quadrat 3 on 15th April 2013.

By 2016 and in subsequent years only one quadrat (Quadrat 5) contained American skunk cabbage plants and these were all seedlings or young plants.

The monitoring has demonstrated that the decrease in American skunk cabbage in Lymington Reedbeds Nature Reserve has been accompanied by an increase in some of the native plants. For example, between 2013 and 2019 the percentage cover of opposite-leaved golden saxifrage has increased in four of the quadrats, the percentage cover of common marsh bedstraw has increased in four of the quadrats, the percentage cover of water mint has increased in four of the quadrats and the percentage cover of valerian has increased in three of the quadrats.

It is interesting to note that the monitoring has demonstrated that the decrease in American skunk cabbage has been accompanied by a decrease in the invasive non-native Himalayan balsam since 2016, due to the work undertaken by volunteers to control the balsam on behalf of the NFNNPP.

When the quadrats were installed in 2013 three of them contained Himalayan balsam. Himalayan balsam control did not commence in this part of the nature reserve until summer 2016; by April 2016 when the monitoring was undertaken, four of the quadrats contained Himalayan balsam (Figure 46). By April 2018 only two of the quadrats contained Himalayan balsam and by April 2019 none of the quadrats contained Himalayan balsam.

Figure 46: Himalayan balsam seedlings growing in Quadrat 5 on 18th April 2016.

The monitoring has demonstrated that the decrease in American skunk cabbage in Lymington Reedbeds Nature Reserve has been accompanied by a decrease in the amount of bare ground/leaf litter/water in five of the six quadrats between 2013 and 2019, as the vegetation cover of native plants has increased.

For example, the amount of bare ground/leaf litter in Quadrat 3 was recorded as 9 on the DOMIN scale during 2013 (Figure 47) and this had fallen to 5 on the DOMIN scale by 2019 (Figure 48).

Figure 47: Volunteer Guy Mason monitoring Quadrat 3 on 15th April 2013.

Figure 48: Project Officer Jo Gore monitoring the same quadrat (Quadrat 3) on 1st April 2019.

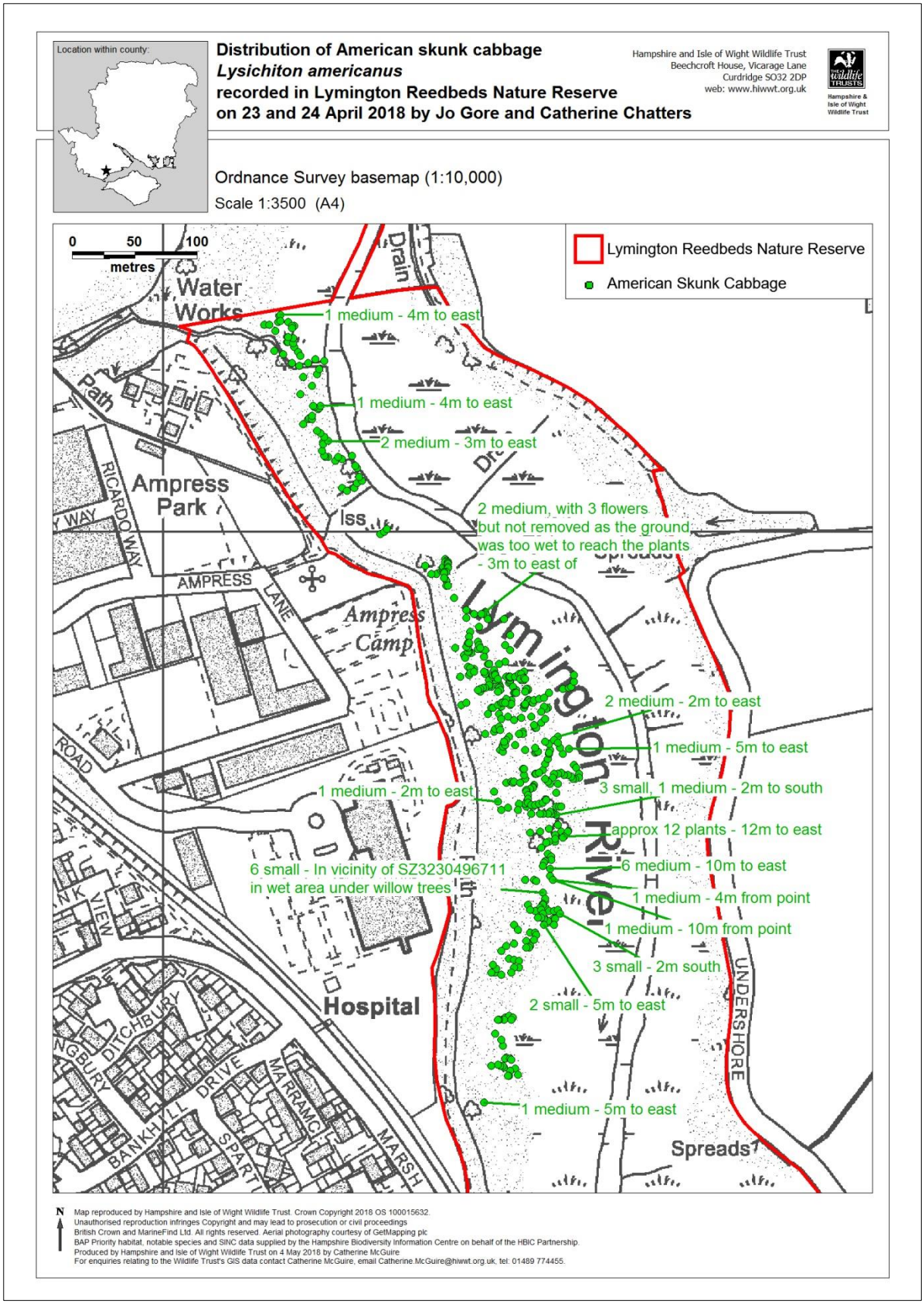


Figure 49: American skunk cabbage recorded in Lymington Reedbeds Nature Reserve in April 2018.

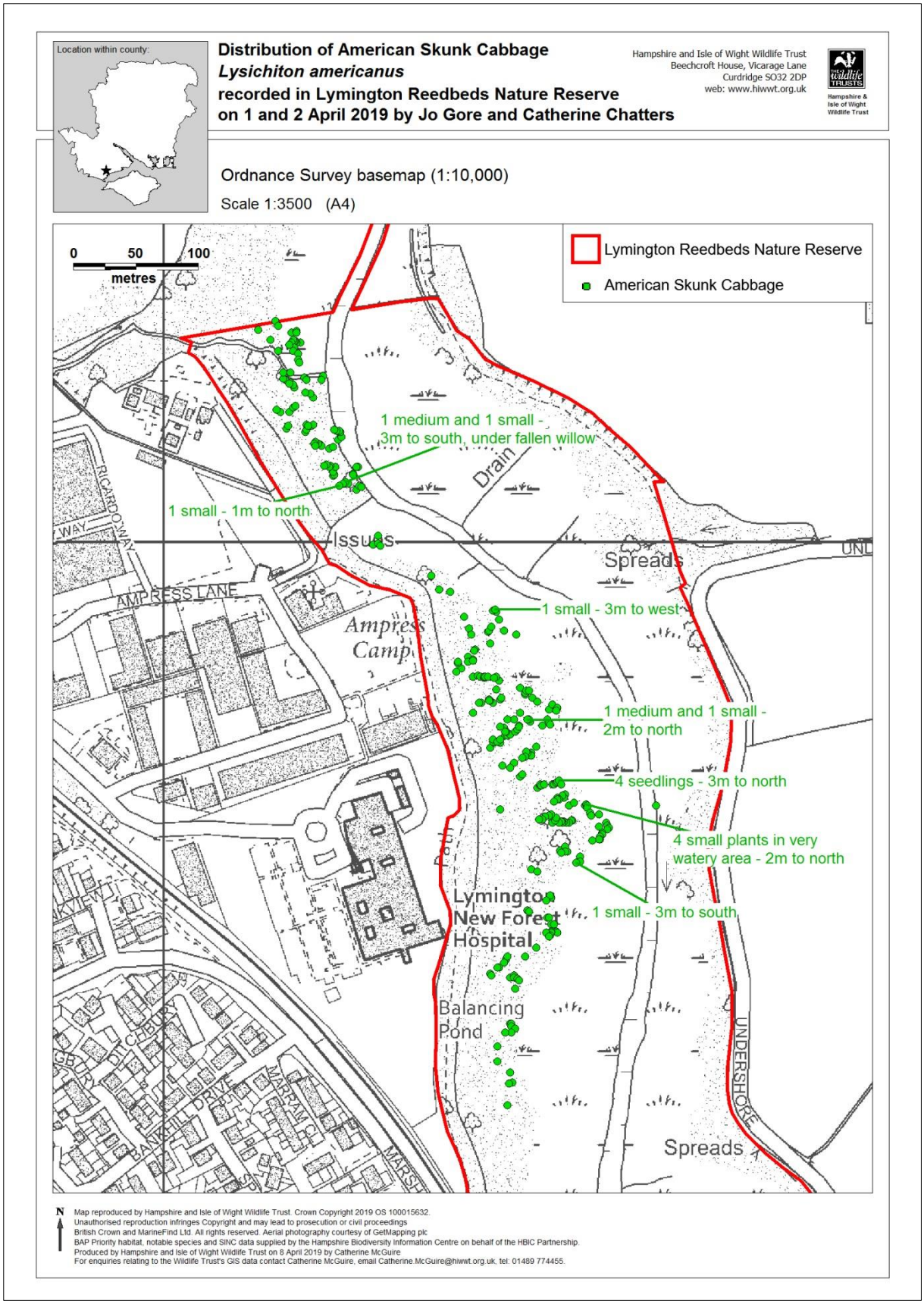


Figure 50: American skunk cabbage recorded in Lymington Reedbeds Nature Reserve in April 2019.

The decrease in the American skunk cabbage plants as a result of herbicide treatment demonstrated by the monitoring of the six quadrats since 2013 is representative of the decrease in the population of American skunk cabbage throughout the nature reserve. The surveys undertaken by the Project Officers in April during 2016, 2017, 2018 and 2019 have involved detailed recording of American skunk cabbage plants within the part of the nature reserve to the west of the Lymington River (as only a few, isolated American skunk cabbage plants have ever been found within the nature reserve to the east of the Lymington River) using a hand-held GPS device to record 10 figure grid references. Using these GPS readings, maps have been created which reveal the decrease in distribution and density of the American skunk cabbage population; maps relating to 2018 and 2019 are shown as examples of this decrease (Figure 49 and Figure 50). Since 2016 the Project Officers have also described these plants, noting their relative size, maturity and whether they are in flower.

The report of the monitoring exercise undertaken in the nature reserve on 1st and 2nd April 2019 includes the following general impressions:

- American skunk cabbage plants occur mainly as scattered, individual plants, rather than in large or dense groups;
- the majority of plants are small or medium;
- very few American skunk cabbage plants are flowering;
- although small American skunk cabbage plants occur, there are very few seedlings;
- only one quadrat (Quadrat 5) contained living American skunk cabbage plants; when the quadrats were installed in April 2013 all six quadrats contained American skunk cabbage plants.

5.2.6. Conclusions

In conclusion, although further work will be required to eradicate American skunk cabbage from the Lymington Reedbeds Nature Reserve, the population has been very substantially reduced since herbicide treatment commenced. By April 2019 the American skunk cabbage plants occurred mainly as scattered, individual plants, rather than in large or dense groups and very few of them were flowering; the majority of the skunk cabbage plants were small or medium and there were very few seedlings.

The control of American skunk cabbage has helped to restore the diverse woodland flora of the Lymington Reedbeds Nature Reserve (Figure 51).

Figure 51: Woodland flora in Lymington Reedbeds Nature Reserve (Photograph: Clive Chatters).

5.3. Holmsley Bog as an Example of Successful Control of Pitcher Plants

Volunteer work parties arranged by the NFNNPP have resulted in a large decrease in pitcher plants at a number of wetland sites in the New Forest. This case study relates to the impact of the control of pitcher plants at Holmsley Bog where work has been undertaken since 2010.

5.3.1. Description of Holmsley Bog

Holmsley Bog is a valley bog, sometimes referred to as 'valley mire'. This habitat type is an unusual and internationally rare occurrence of bog vegetation. The New Forest has the most extensive and best preserved examples of valley bog in lowland western Europe (Tubbs, 2001).

Holmsley Bog is situated to the south of Burley and lies within the catchment of the Avon Water (Figure 52). It supports valley bog vegetation dominated by hummocks of purple moorgrass *Molinia caerulea* and the bog moss *Sphagnum papillosum*. The hummocks support cross-leaved heath *Erica tetralix*, bog myrtle *Myrica gale*, cotton grass Eriophorum angustifolium, sharp-flowered rush *Juncus acutiflorus*, bog asphodel *Narthecium ossifragum* and white-beaked sedge *Rhyncospora alba*. The wet areas between the hummocks support lawns of the bog mosses *Sphagnum auriculatum* and *Sphagnum cuspidatum*. Flowing through the valley bog vegetation is a runnel within which the vegetation is dominated by a mat of the bog moss *S. cuspidatum* and may-stalked spike-rush *Eleocharis multicaulis*.

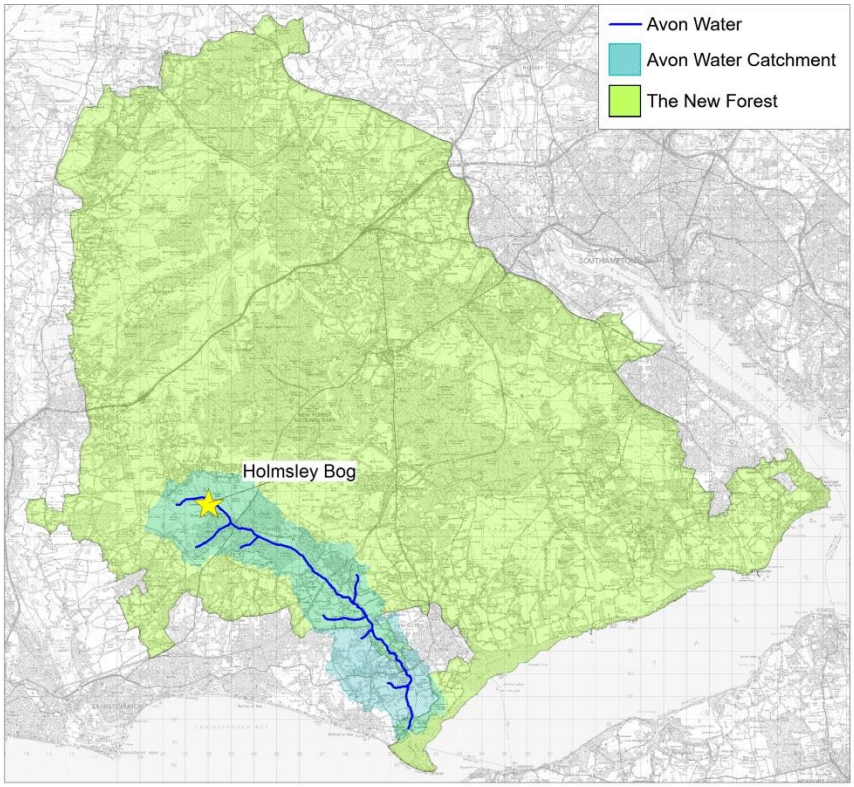


Figure 52: Holmsley Bog within the catchment of the Avon Water.

5.3.2. The ecological importance of Holmsley Bog

Holmsley Bog has a number of statutory nature conservation designations as it forms part of:

- The New Forest SSSI
- The New Forest Special Area of Conservation
- The New Forest Special Protection Area
- The New Forest Ramsar Site

Holmsley Bog and nearby mires were specifically referred to by Derek Ratcliffe as one of the four most important areas within the Grade 1* (internationally important) New Forest Valley Mires Nature Conservation Review (NCR) site (Ratcliffe, 1977). The NCR selected these four mire systems within

the New Forest as being the highest in quality and exhibiting the range of variation within the mires. The NCR's approach emphasises the importance of Holmsley Bog within the New Forest mires.

Holmsley Bog has been described by Neil Sanderson (Sanderson, 2012) as 'a major site within the internationally important complex of valley bogs within the New Forest'.

5.3.3. The pitcher plant population at Holmsley Bog

The pitcher plant population on the edge of Holmsley Bog (Figure 53) resulted from it being planted there some time prior to 1987 (Brewis et al, 1996). Ashley Basil had been informed by a horticulturist that the planting had been undertaken during the 1970s to provide a source of plants for his commercial nursery (Ashley Basil, pers. comm.). Since then, the original plant had seeded widely, especially downstream within the mire, mainly growing in hummocks in the bog vegetation but also on the soft, wet peat of the runnel which flows through the bog.

As mentioned in section 6.1.2 of this report, Neil Sanderson was commissioned by the NFNNPP in 2012 to assess the impact of the pitcher plant population on Holmsley Bog (Sanderson, 2012). Sanderson observed that the largest pitcher plants completely occupied the top of the hummocks within the *Rhyncospora alba – Sphagnum auriculatum* sub-community of the type of vegetation referred to by the National Vegetation Classification (Rodwell, 1991) as M21 *Narthecium ossifragum – Sphagnum papillosum* valley mire. This is an ecologically rich part of the valley bog vegetation; the tops of the hummocks are dominated by cushions of the bog moss *Sphagnum papillosum* that support a diverse epiphytic liverwort community including the nationally scarce *Cephalozia macrostachya* and the bog specialists *Cladopodiella fluitans*, *Kurzia paucifolia* and *Odontoschisma sphagni*. This liverwort assemblage is threatened and has declined greatly in lowland England.

Sanderson noted that within the centre of the site nearly all the surviving liverwort-rich hummocks supported pitcher plant seedlings. He observed that the pitcher plants appeared not to be grazed by commoners' stock and warned that, if uncontrolled, the pitcher plants would have the capacity to occupy most of the bog moss-dominated hummocks within the mire, thereby threatening the nationally scarce *Cephalozia macrostachya* and the general specialised epiphytic liverwort flora.

Sanderson also noted that the valley bogs of the New Forest are of exceptional importance for invertebrates and warned that the pitcher plants could have an adverse impact on the invertebrate fauna of Holmsley Bog.

Figure 53: Mature pitcher plant at Holmsley Bog on 29th October 2012.

5.3.4. Control of pitcher plants at Holmsley Bog

At the request of the Forestry Commission, the Project Officer and volunteers removed the majority of the pitcher plants at Holmsley Bog in 2010 and 2012. At least 165 plants were dug up during 2010 and at least 313 plants were dug up on 29th October 2012 (Figure 54 and Figure 55).

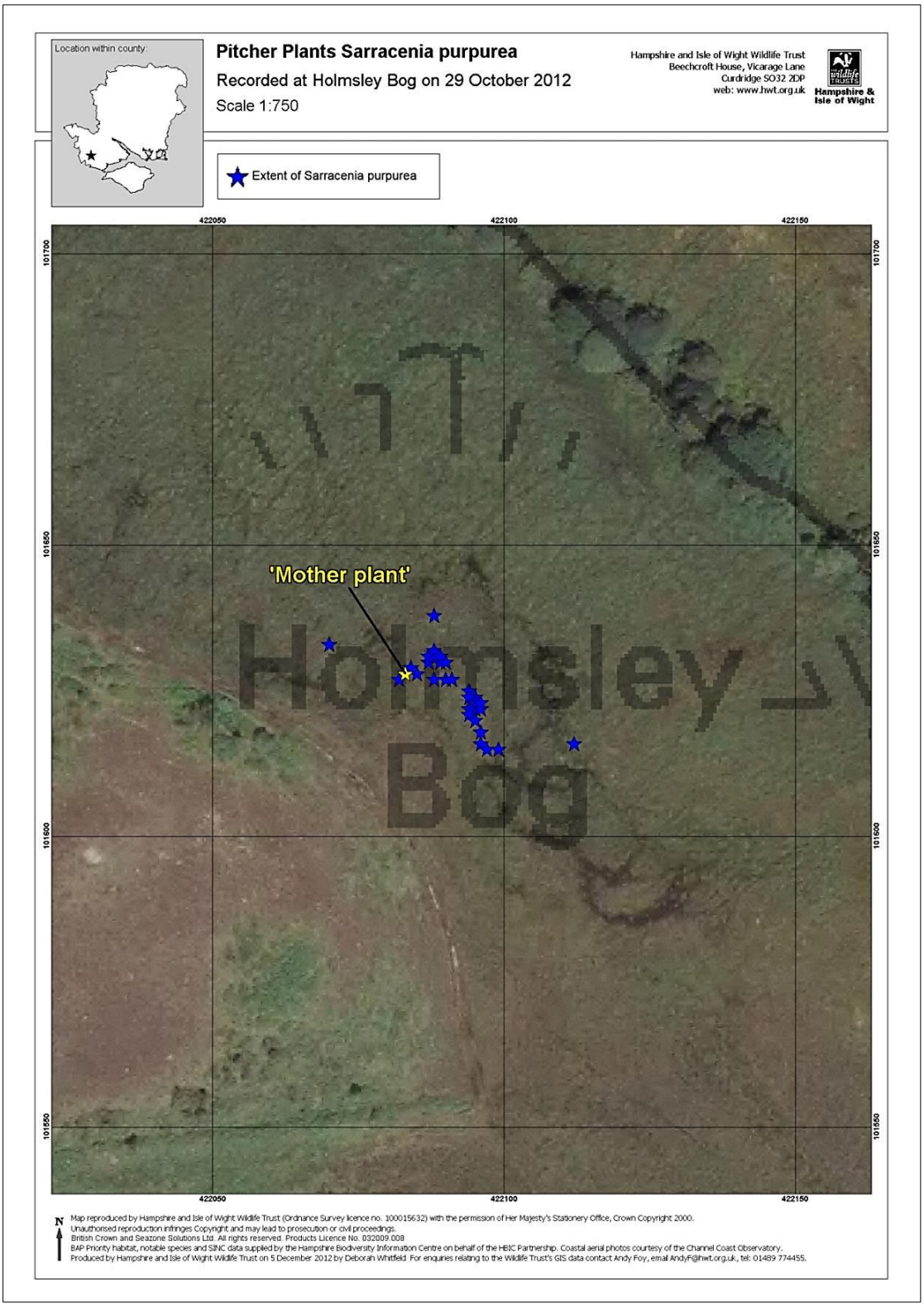


Figure 54: The location of the original 'mother plant' and the distribution of the 313 pitcher plants which were dug up from Holmsley Bog on 29th October 2012.

The original 'mother plant', which had developed into a large clump of pitcher plants measuring 120 cm x 120 cm at grid reference SU 22083 01628, (Figure 56) together with 64 seedlings and young plants were removed on 28th January 2013 but it was clear that further work would be needed to remove the remaining plants and any which might germinate.

The Project Officer decided that it would be prudent to wait until the winter as a) this would avoid the sensitive ground-nesting bird breeding season and b) it would enable the seedlings to grow larger, therefore making it easier to pull them out without damaging surrounding *Sphagnum*-dominated species-rich vegetation. A further task was therefore undertaken on 4th November 2013 when 97 plants (comprising seedlings, young plants and remains of the rootstock of the original 'mother plant') were removed. Following the work party on 4th November 2013, it was agreed that further work would be needed during winter 2014 to remove any remaining small plants including plants which might have germinated from the seed bank.

On 3rd November 2014 three volunteers helped the Project Officer to mark out and record the extent of the remaining pitcher plant population and count the number of pitcher plants removed. A total of 38 canes were used to mark out the extent of the remaining pitcher plants. Photographs were taken and grid references were recorded at each cane using a hand-held Garmin 'etrex' device. It was clear that the population had decreased in extent since 2013. No plants were found upstream of the site of the original 'mother plant' and the downstream extent of the population had contracted. 108 plants were removed on 3rd November 2014.

On 2nd November 2015 three volunteers helped the Project Officer to mark out and record the extent of the remaining pitcher plant population and count the number of pitcher plants removed. Yellow flags on wires were inserted to mark the location of individual pitcher plants or groups of pitcher plants. GPS readings were taken using a hand-held Garmin 'etrex' device at 4 metres accuracy and the number of pitcher plants was counted. None of the pitcher plants recorded on 2nd November 2015 showed evidence of having produced flowers so they were categorised as seedlings, small juvenile plants, medium juvenile plants or large juvenile plants. Plants were described as 'large juvenile' plants if their pitchers were large enough to be capable of catching invertebrates. A total of 140 juvenile and seedling pitcher plants (49 pitcher plant seedlings, 46 small juvenile plants, 28 medium sized juvenile plants and 17 large juvenile plants) were removed on 2 November 2015 (Figure 57).

On 7th November 2016 five volunteers helped the Project Officer to locate and record the pitcher plants. A total of 43 plants (7 seedlings, 14 small juvenile plants, 14 medium juvenile plants, 7 large juvenile plants and 1 mature plant) were removed.

On 6th November 2017 seven volunteers helped the Project Officer to find, record and remove a total of 32 seedlings and young plants. No mature plants were found on that occasion.

On 5th November 2018 six volunteers helped the Project Officer to mark out, record and remove a total of 12 pitcher plants (1 seedling, 6 small juvenile plants and 5 medium juvenile plants).

On 4th November 2019 Bridget Leyden of Natural England together with 3 volunteers helped the Project Officer to find, record and remove a total of 14 pitcher plants (1 seedling, 2 small juvenile plants, 7 medium juvenile plants and 4 large juvenile plants) (Figure 58 and Figure 59).

The results of the volunteer work parties led by the NFNNPP between 2010 and 2019 are shown in Table 1.

Table 1: Number of pitcher 'plants' removed from Holmsley Bog during volunteer work parties arranged by the New Forest Non-Native Plants Project

Date	**Number of 'plants' removed**
3rd February 2010	165
29th October 2012	313
28th January 2013	'Mother plant' plus 64 seedlings & young plants
4th November 2013	97 plants (ie seedlings, young plants and remains of the rootstock of the original 'mother plant')
3rd November 2014	108
2nd November 2015	140 seedlings and juvenile plants
7th November 2016	43 seedlings, juvenile and mature plants
6th November 2017	32 seedlings and juvenile plants
5th November 2018	12 seedlings and juvenile plants
4th November 2019	14 seedlings and juvenile plants
Total	**988**

NB: It is important to note that the total number given above is an under-representation of the actual number of individual plants removed from Holmsley Bog as some of these 'plants' were large clumps comprising a number of individual plants. This is particularly relevant to the original 'mother plant' which, at the time of its removal in January 2013, comprised a large clump of plants covering approximately 120 cm x 120 cm. (However the figures relating to the number of plants removed on 2nd November 2015, 7th November 2016, 6th November 2017, 5th November 2018 and 4th November 2019 are accurate).

Figure 55: Pitcher plant seeds photographed at Homsley Bog on 29th October 2012.

Figure 56: The original 'mother plant' photographed at Holmsley Bog on 29th October 2012 prior to its removal on 28th January 2013.

Figure 57: Removal of juvenile pitcher plant by hand on 2nd November 2015.

Figure 58: Volunteer marking location of pitcher plants at Holmsley Bog with yellow flags on 4th November 2019.

Figure 59: Pitcher plant removed from Holmsley Bog on 4th November 2019.

By November 2019, following a thorough search, only 14 pitcher plants could be found at Holmsley Bog and none of these showed evidence of having flowered and produced seeds (Figure 60). The volunteer work parties since 2010 have depleted the seed bank and it is hoped that within a few years the pitcher plant population will be eradicated from this site.

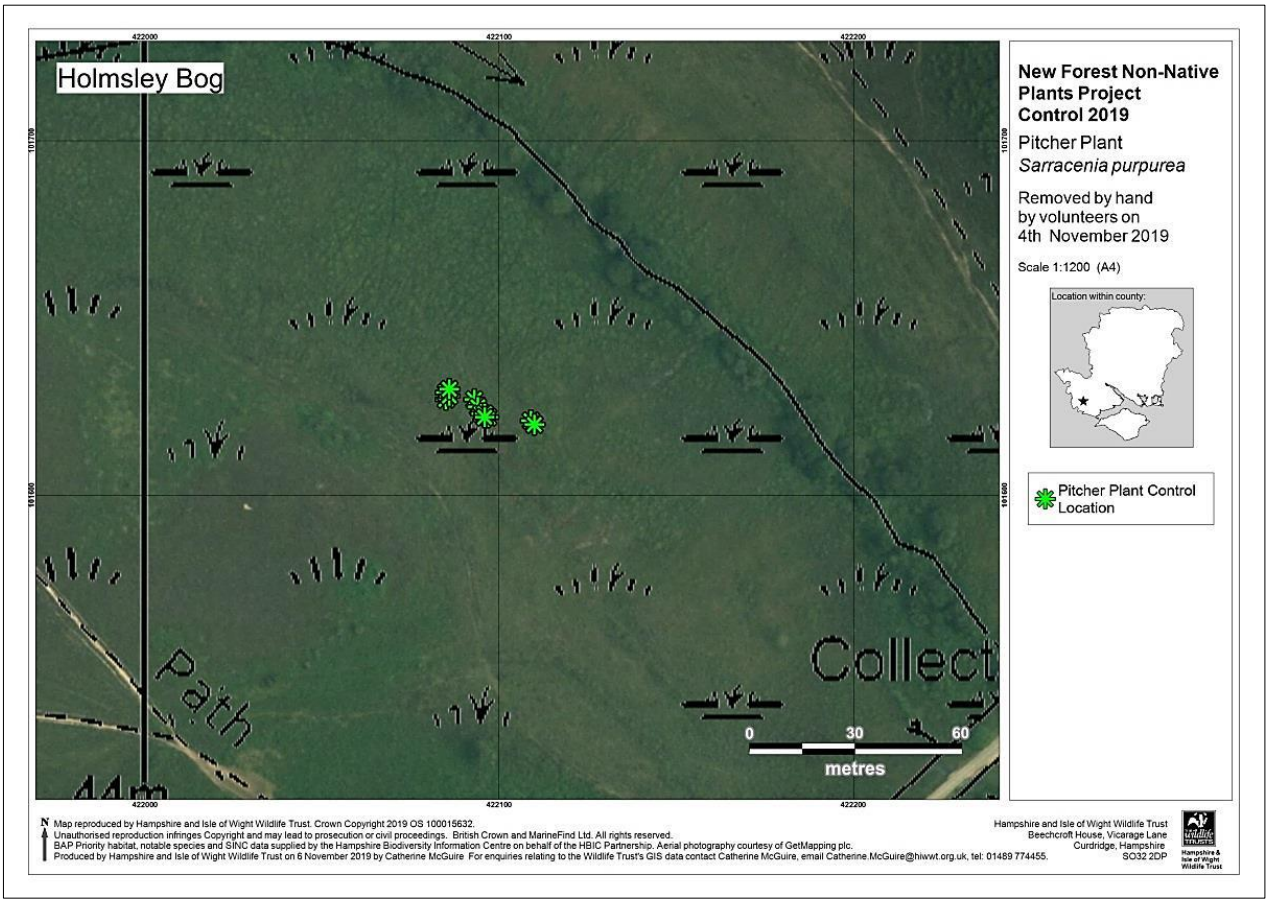


Figure 60: Location of the 14 pitcher plants which were removed from Holmsley Bog on 4th November 2019.

5.3.5. Conclusions

The removal of pitcher plants at Holmsley Bog is referred to by Kevin Walker in an article in the New Journal of Botany (Walker, 2014). The work undertaken by the NFNNPP at Holmsley Bog is cited as an example of successful manual removal of plants where numbers of mature and juvenile plants were relatively small, in comparison with larger populations such as at Wedholme Flow in Cumbria where over 6 tonnes of material have been removed since 2000 with no apparent effect on the overall size of the population.

The work carried out at Holmsley Bog highlights a) the importance of controlling pitcher plant populations during the relatively early stages of establishment and b) the need for careful monitoring of regeneration. Walker concludes that 'by comparison, the eradication of large, well-established populations has been much less successful and indeed the experience at Wedholme Flow suggests that the removal of such populations will be costly and almost impossible without causing significant damage to sensitive sites'.

The Project Officer is very grateful to the volunteers who have helped monitor and remove the pitcher plants at Holmsley Bog since 2010.

5.4. Breamore as an Example of Successful Control of Creeping Water Primrose

Creeping water primrose is regarded as a high priority for eradication from the wild in the UK due to its potential to cause serious damage to the aquatic environment, as experienced in France, The Netherlands and Belgium where it smothers water bodies reducing the number of native species and potentially increasing the risk of flooding (Figure 61).

This case study relates to the control of creeping water primrose at Breamore Marsh SSSI within New Forest District where work has been undertaken since 2009.

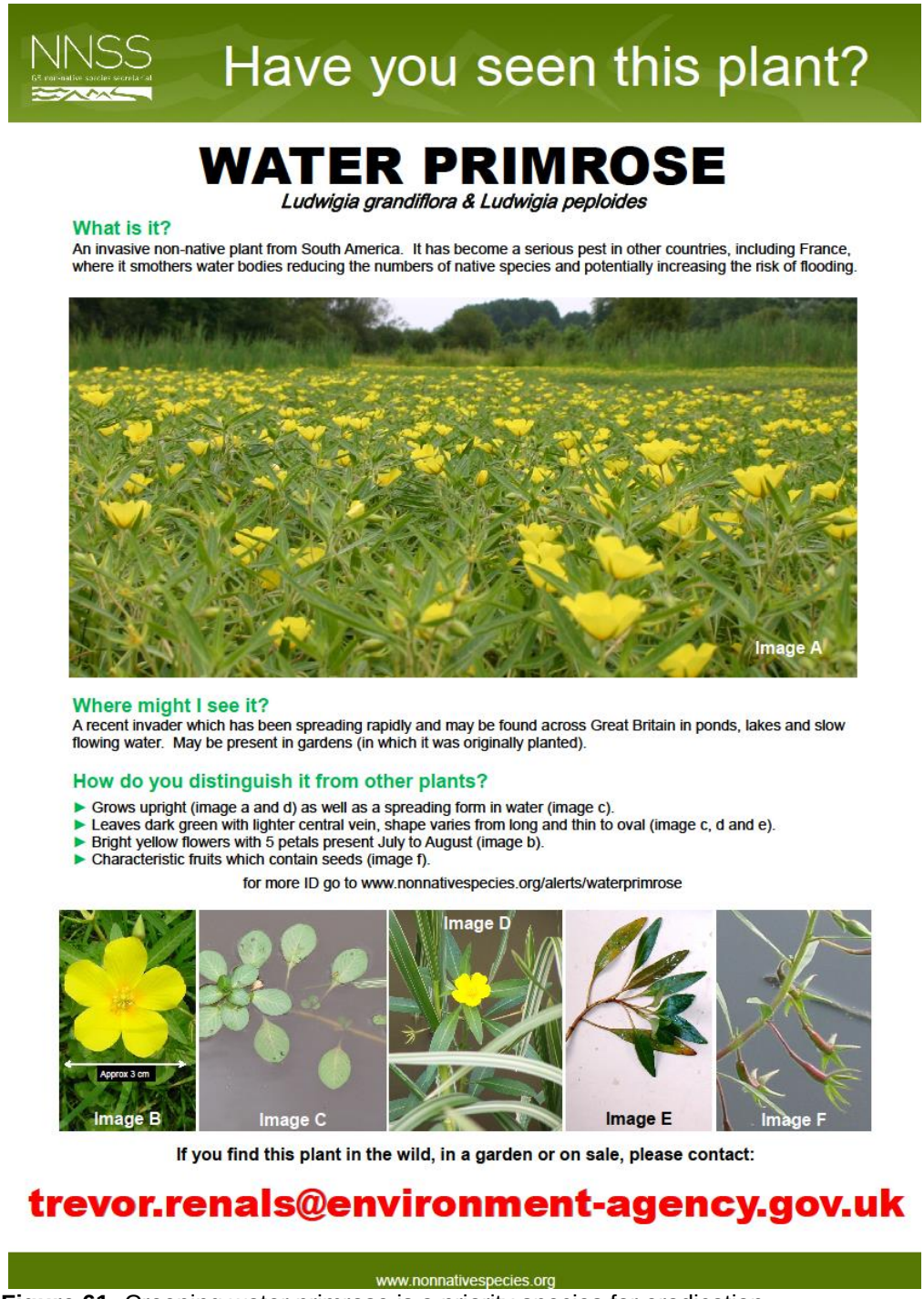


Figure 61: Creeping water primrose is a priority species for eradication.

5.4.1. Description of Breamore Marsh

Breamore Marsh lies within the catchment of the River Avon (Figure 62) and has been notified as a SSSI due to its flora associated with a number of shallow ponds.

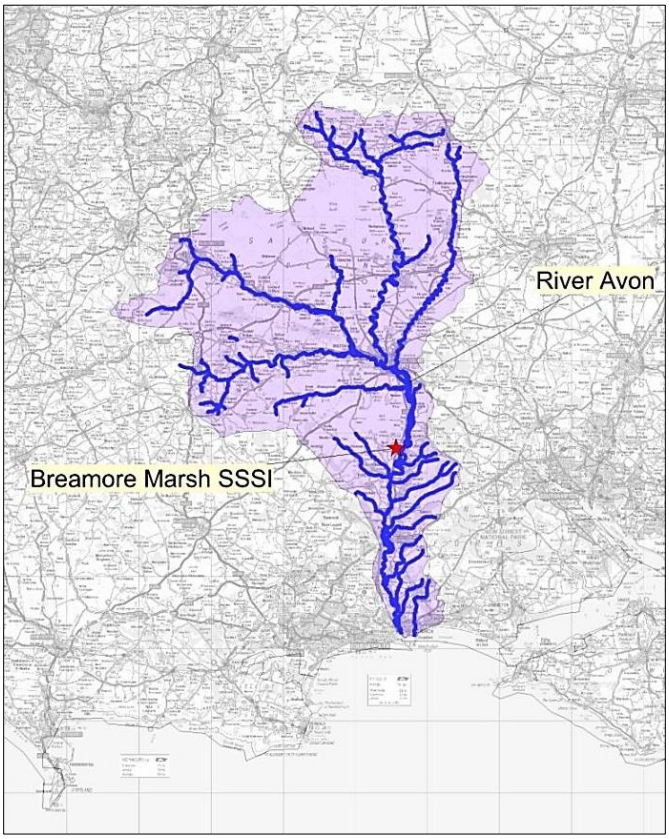


Figure 62: Location of Breamore Marsh.

5.4.2. The ecological importance of Breamore Marsh

Breamore Marsh was first notified as a Site of Special Scientific Interest (SSSI) during 1978 in accordance with the National Parks and Access to the Countryside Act 1949 and re-notified during 1984 in accordance with the Wildlife and Countryside Act 1981 (as amended). The SSSI citation for Breamore Marsh describes this site as

"An important surviving manorial green on which goose and cattle grazing persists. The grassland flora, whilst limited, is of interest in the extent to which its species composition has been derived from its grazing history. The marsh includes a series of shallow pools and connecting waterways which support an exceptionally rich aquatic flora. The ponds have margins of base-enriched bare mud in summers that are not excessively wet, with a near-unique assemblage of aquatic and semi-aquatic plants, including the national rarity brown cyperus *Cyperus fuscus*, common mudwort *Limosella aquatica* (which has only two or three other sites in Hampshire), and pennyroyal *Mentha pulegium*".

Neil Sanderson, an expert botanist who was commissioned to undertake a botanical survey of the SSSI during 2013, recognised that Breamore Marsh contains a type of vegetation which is regarded as important in a European context. The EU Habitats and Species Directive recognises certain habitat types (known as 'Annex I' habitats) which require protection through designation as Special Areas of Conservation (SACs) and although Breamore Marsh has not been selected as a SAC:

Breamore Marsh SSSI supports one of the best developments of the *Isoeto – Nanojuncetea* aspect of the Annex 1 Habitats Directive habitat 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto – Nanojuncetea in Britain (Sanderson, 2013a).

5.4.3. Creeping water primrose at Breamore Marsh

Creeping water primrose (Figure 63) was discovered at Breamore Marsh on 13th August 2009 by Clive Chatters, a local naturalist, whilst monitoring brown galingale *Cyperus fuscus* the rare native plant that grows at this site. The creeping water primrose was found in 'Round Pond' at approximate grid reference SU 155 183 in the north-western part of Breamore Marsh as indicated in Figure 64.

Figure 63: Creeping water primrose in Round Pond Breamore Marsh (Photograph: Trevor Renals, Environment Agency).

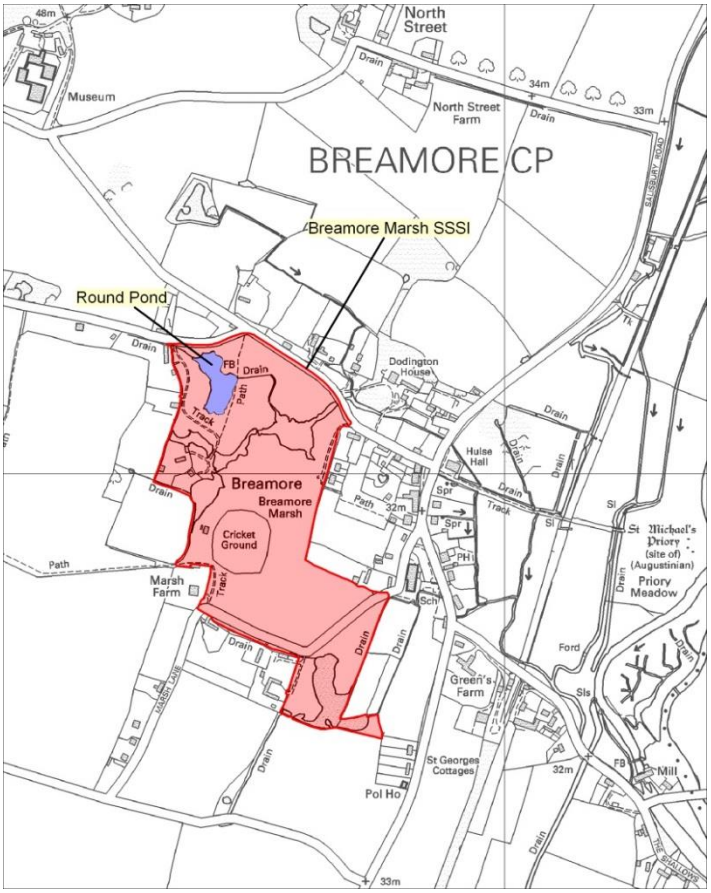


Figure 64: Location of Round Pond where creeping water primrose was discovered in August 2009.

The Botanical Society of the British Isles' Vice County Recorder for South Hampshire (VC 11) was immediately informed so that identification could be accurately determined and verified.

The New Forest Non-Native Plants Officer was alerted to the presence of creeping water primrose at Breamore Marsh and recognised the importance of eradicating the population as soon as possible, to prevent its spread within Breamore Marsh SSSI and, potentially, into the River Avon which is designated as a SSSI, SAC and SPA (Figure 65 and Figure 66).

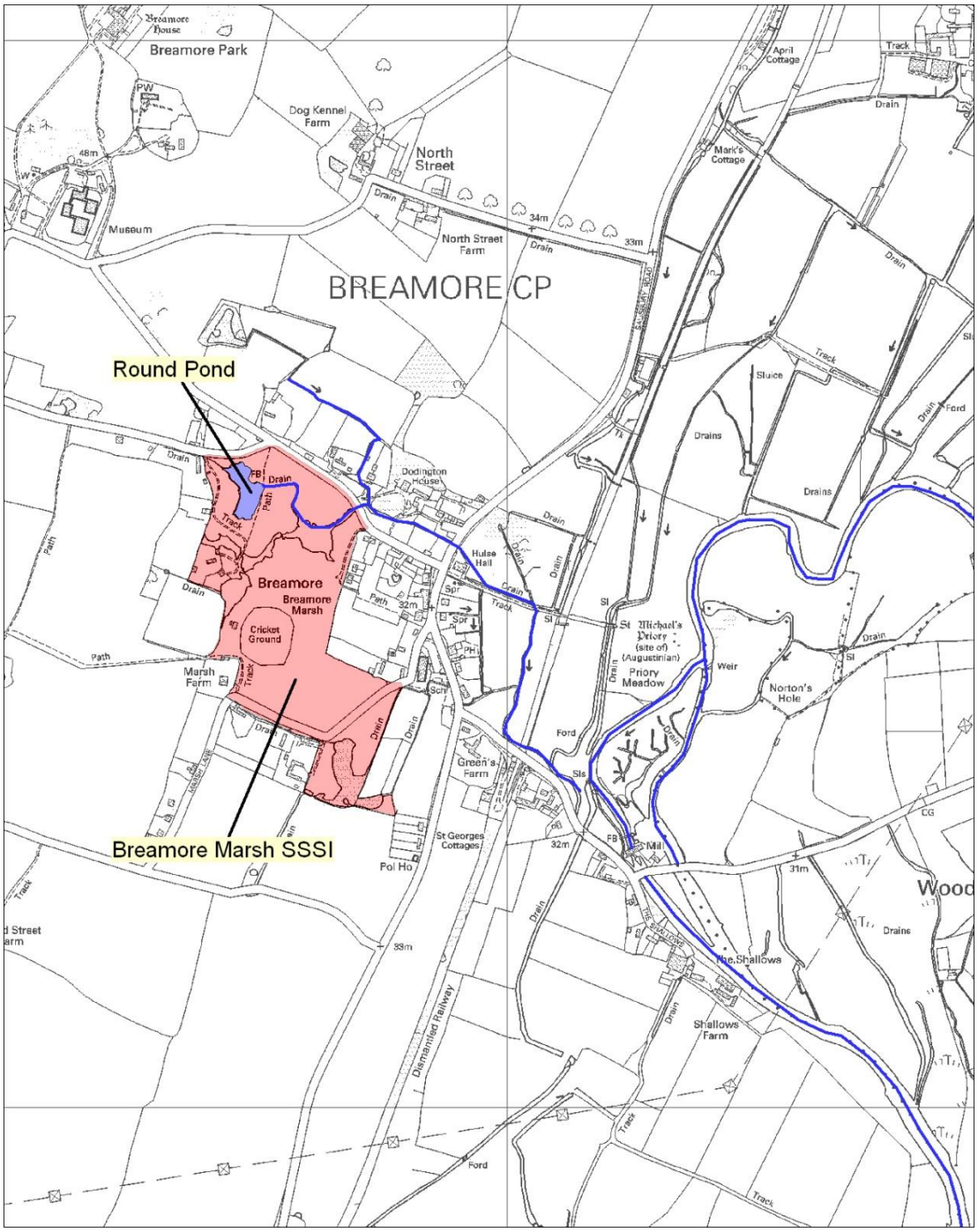


Figure 65: Map showing the watercourses linking Round Pond to the River Avon.

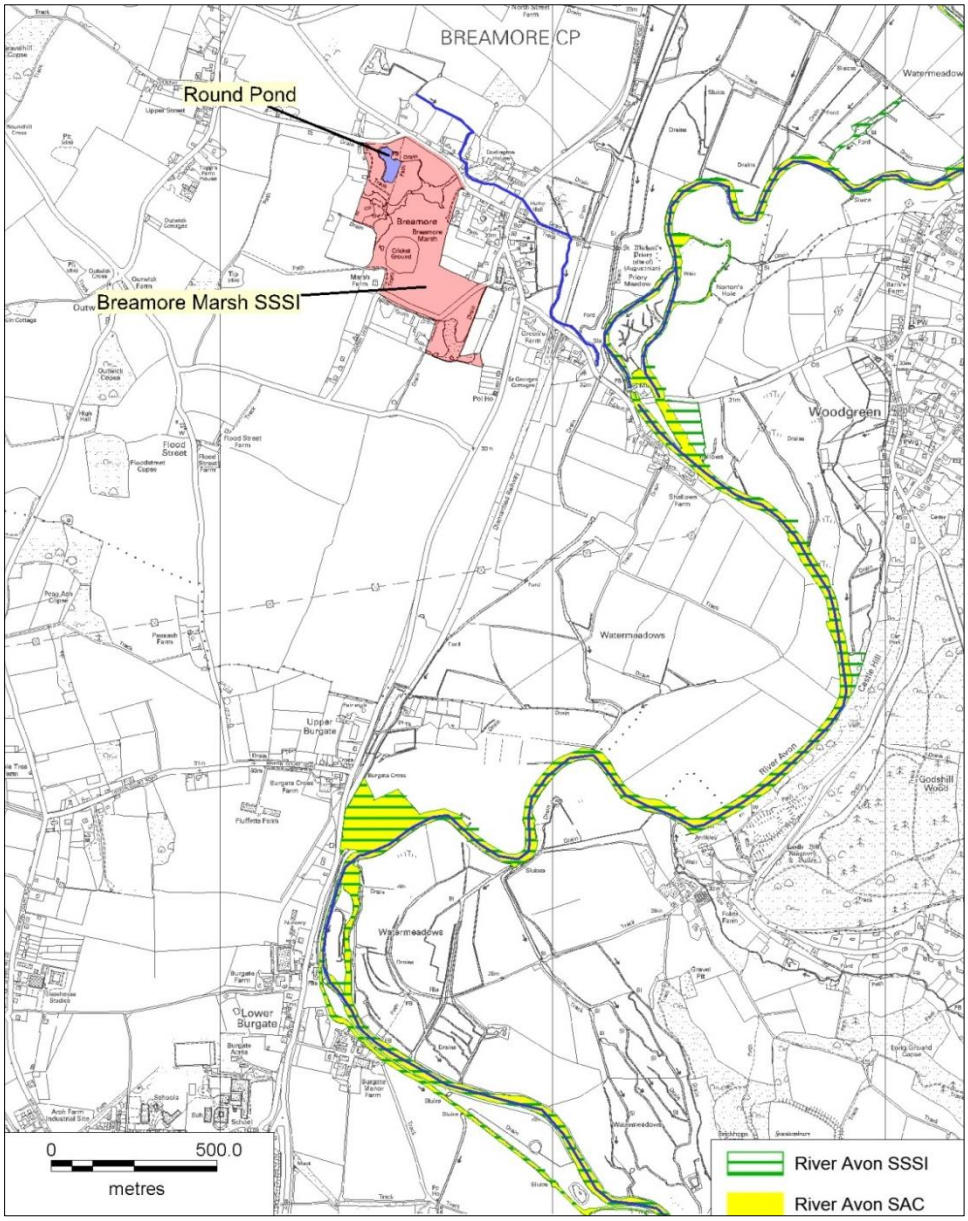


Figure 66: Map highlighting the proximity of Breamore Marsh SSSI to the River Avon SSSI / SAC.

Natural England's local officer with responsibility for this area was alerted on 14th August 2009, with a request that Natural England alert the Environment Agency. The botanist who discovered the creeping water primrose at Breamore Marsh remarked to Natural England that "The botanical interest of the pond concerned is high but ephemeral and comprises species that will readily grow from the seedbank. I would recommend comprehensive herbicide use erring on the side of eradication rather than tinkering. The water levels are low at present and there is time to eradicate these species *[Ludwigia grandiflora and Crassula helmsii]* before the winter wetting of the ponds and the associated floods that could move these species to the remainder of the pond complex".

On 16 August 2009 the BSBI Vice County Recorder visited Breamore Marsh to collect a sample and verify identification as *Ludwigia grandiflora*.

On 18 August 2009 the Environment Agency's invasive non-native species specialist suggested to Natural England that funding associated with the Water Framework Directive could be used to eradicate the creeping water primrose at this site and Natural England's Species Recovery Programme Manager agreed to 'mobilise' funds (up to £2,000) accordingly.

5.4.4. Control of creeping water primrose at Breamore Marsh

Control of creeping water primrose during 2009

Natural England selected Kingcombe Aquacare Ltd as an appropriate contractor to undertake herbicide treatment of the creeping water primrose at Breamore Marsh SSSI. This company had proven experience of controlling other invasive non-native aquatic plant species and was known to Natural England and the Environment Agency.

The covering letter which accompanied the quotation from Kingcombe Aquacare stated "the *Ludwigia* responds very well to treatment using Glyphosate (Roundup Pro Biactive) and Topfilm, however there is no 'silver bullet' and it will take repeated visits to control the colonisation, yet being caught early we stand in good stead to achieve control. *Ludwigia* is still a little of a learning curve, as active control has only been happening for the last twelve months in this country, however our own treatments are working well, and now in year two we are dealing with new, smaller regrowth from nodes on the older stems, a huge reduction in biomass….One factor we discussed on site was the exclusion of grazing animals from the area; this has more to do with the effects of poaching pushing fragments of the plants under ground preventing them from being sprayed and also building up a 'cache' of propagules ready to replace those chemically controlled".

Natural England's Species Recovery Programme Manager confirmed the provision of funding for two herbicide treatments to be undertaken to control the creeping water primrose at Breamore Marsh.

Kingcombe Aquacare submitted the necessary forms to notify the Environment Agency of the intention to use an approved herbicide near water and approval was given by the EA during September 2009.

Natural England agreed to arrange for consent to be issued, in accordance with the Wildlife and Countryside Act 1981 (as amended), for herbicide treatment to be undertaken within the SSSI.

On 29th September 2009 Kingcombe Aquacare Ltd informed the New Forest Non-Native Plants Officer that (weather permitting) the first herbicide treatment was scheduled to occur during the week beginning 5th October 2009, with the second treatment being undertaken during the second week of November 2009.

On 30th September 2009 the New Forest Non-Native Plants Officer issued a Purchase Order to Kingcombe Aquacare Ltd for two herbicide treatments to be undertaken during 2009.

On 1st October 2009 the Project Officer visited Breamore Marsh with Trevor Renals of the Environment Agency and Sophie Thomas of the plant conservation charity called Plantlife (Figure 67). Trevor Renals is the author of the Environment Agency's helpful publication 'Managing invasive non-native plants in or near fresh water' published in April 2010 which gives advice on control of creeping water primrose.

Figure 67: Sophie Thomas of Plantlife with creeping water primrose at Breamore Marsh on 1st October 2009.

The creeping water primrose was dominant over large parts of Round Pond, spreading across bare mud, forming dense mats of foliage and flowering amongst other vegetation (Figure 68, Figure 69, Figure 70, Figure 71).

Figure 68: Creeping water primrose photographed at Round Pond on 1st October 2009 (Photograph: Trevor Renals).

Figure 69: Creeping water primrose photographed at Round Pond on 1st October 2009 (Photograph: Trevor Renals).

Figure 70: Creeping water primrose photographed at Round Pond on 1st October 2009 (Photograph: Trevor Renals).

Figure 71: Creeping water primrose photographed at Round Pond on 1st October 2009 (Photograph: Trevor Renals).

Kingcombe Aquacare Ltd planned to undertake the first herbicide treatment on Tuesday 6th October 2009 but unfortunately the weather that day was very wet and the work had to be postponed until 29th October 2009 as herbicide treatment is only effective in dry conditions (Figure 72, Figure 73).

Figure 72: Scott Rice and George Hyde of Kingcombe Aquacare Ltd preparing the herbicide at Breamore Marsh SSSI on 29th October 2009.

Figure 73: The creeping water primrose at Breamore Marsh was treated with the Glyphosate-based herbicide Roundup Pro Biactive and an adjuvant called 'Topfilm'.

On 19th November 2009 the New Forest Non-Native Plants Officer and a representative of Plantlife visited Round Pond to mark out the creeping water primrose which required further herbicide treatment. 'Flags' made from red adhesive tape were attached to the top of garden canes to mark out areas where further herbicide treatment was necessary (Figure 74). Although some patches of creeping water primrose had clearly been affected by the herbicide treatment, there was evidence of fresh, new growth from many of these patches.

Figure 74: Sophie Thomas of Plantlife at Breamore Marsh on 19th November 2009 marking out areas where more herbicide treatment is required.

Although there was no rain for the 24 hour period immediately following the herbicide treatment undertaken on 29th October 2009, there had since been a lot of rain so areas which were bare mud or terrestrial vegetation at the time of the herbicide treatment were under water on 19th November 2009. By 19th November 2009 the vast majority of the creeping water primrose was submerged (Figure 75).

Figure 75: Creeping water primrose *Ludwigia grandiflora* leaves submerged on 19th November 2009.

The New Forest Non-Native Plants Officer asked Kingcombe Aquacare Ltd to select a suitable date (depending on weather conditions) for a second herbicide treatment during 2009. On 24th November 2009 the contractors informed the project officer that a second treatment was planned for 26th November 2009 but the weather forecast was not favourable. The contractors regarded the treatment of the creeping water primrose as a high priority and stated that 'as soon as the weather breaks' they would arrange a day to undertake the second treatment.

The contractors advised that "Once the Ludwigia and Crassula are submerged there really is very little we can do…we can still treat anything exposed or clear of the water…The Ludwigia should start dying back as soon as we get some colder weather; it does survive the winter but only just! Therefore I think it would be a good idea to try and hit it as early as possible next year as soon as a) the weather allows and b) the plants show signs of starting to grow, probably in late May. If we have everything in place by then, we should have the whole summer to maximise the control".

On 4th December 2009 the contractor visited Breamore Marsh to assess the water levels and determine whether further herbicide treatment would be feasible during 2009. He explained "The water level is now right up (probably 2-3" flowing out) and there was even a good cover of ice! We saw your flags and looked around them and could see…some small examples of Ludwigia. The Ludwigia did not look in the best of condition so I would think the cold weather is starting to have an effect on this, however everything we saw was underwater making it impossible to treat. I think it would be good to keep the areas marked if practicable and as soon as the water drops we can look at getting the second treatment on. We are happy to be as flexible as we can, you probably know the site better than I, is the water level likely to drop given a sensible dry spell? If we can stay in touch and keep and eye on water levels we can get the second spray on. Even if it's early in the spring it will still be worthwhile even if the effects take longer to show, because of the slower plant metabolism. Let's hope the monsoon season stops soon and we at least get a really cold dry winter; it all helps!"

The Project Officer sought advice from the local naturalist who had originally discovered the creeping water primrose at Breamore Marsh. He had visited the site annually since the 1980s to monitor the *Cyperus fuscus* and explained that, in his experience, water levels at Round Pond would be unlikely to fall until at least May the following year. In the circumstances, the project officer and Natural England agreed to postpone any proposals for further herbicide treatment until spring/summer 2010 and the project officer removed the marker canes from Round Pond.

Control of creeping water primrose during 2010

During January 2010 the Project Officer asked the contractors to quote for herbicide treatment during spring 2010 when water levels had fallen sufficiently.

The contractors recommended 'a minimum of two visits over the course of the season and preferably three or four'. On 14th February 2010 the project officer commissioned the first herbicide treatment of 2010 and stated 'it is likely that water levels will be too high to undertake the treatment until May 2010 but even this might be too early in the year. I will keep you informed regarding water levels so we can agree a suitable time of year for the work to be undertaken'.

Water levels did not fall sufficiently until August. Herbicide treatment was planned for 6th August 2010 but, due to an unfavourable weather forecast, it was postponed until 9th August 2010. The contractors advised the Project Officer that the full effect of the herbicide treatment would be observed two to three weeks following application and that it would then be appropriate to schedule the next herbicide treatment during early September 2010.

During May 2010 Joanne Gore of Hampshire and Isle of Wight Wildlife Trust joined the New Forest Non-Native Plants Project as a Project Officer and became the Wildlife Trust's main point of contact for the control of the creeping water primrose at this site.

During 2010 the Project Officer discussed various treatments methods with Natural England. Cutting was suggested to reduce the amount of rush *Juncus* spp present in the pond as the rush cover had made spraying difficult in the past and had allow creeping water primrose to survive sufficiently to start re-sprouting. However this suggestion was dismissed as a) it would be very difficult to cut the vegetation until the pond was dry enough and b) there was a risk of spreading the creeping water primrose further as a result of the cut fragments being flung around the pond.

The possibility of mechanical dredging of the pond was discussed to physically remove the creeping water primrose but concern was expressed by Trevor Renals of the Environment Agency that this may lead to compaction on the sensitive SSSI.

During August 2010 Natural England indicated that funding would be provided for a further two herbicide treatments during 2010, 2011 and 2012 and the project officer issued a purchase order for the second herbicide treatment of 2010.

Clive Chatters, who had first discovered the creeping water primrose at Breamore Marsh, visited the site and observed lots of creeping water primrose growing amongst the rushes *Juncus* spp. In early September the contractors contacted the Wildlife Trust to confirm that they were planning to undertake the herbicide treatment and agreed to treat Round Pond thoroughly (by walking through the site in 'transects') to ensure comprehensive treatment of all the *Ludwigia*, including those plants growing amongst the rushes.

By mid September 2010 Round Pond remained dry and the second herbicide treatment of 2010 was undertaken on 16th September. The third treatment that year was undertaken on 15th October 2010. Throughout the treatment season the Project Officer made visits every two weeks to Round Pond and was very pleased at the reduction in the amount of creeping water primrose.

A volunteer working party was led by the Project Officer on 3rd November 2010 to hand-pull remaining plants to help raise awareness of the problems caused by this invasive non-native plant (Figure 76). Posters were displayed around Breamore Marsh and leaflets were delivered to a number of nearby houses. Two local residents volunteered to help the project officer and in two hours (six 'man-hours') they had filled six refuse sacks. On arrival at the site, the initial impression was that the herbicide treatment had effectively killed all the creeping water primrose but when a dead-looking stem was pulled up and scraped, it was apparent that it was still alive. Some creeping water primrose plants were sprouting where they had disappeared out of view under rushes *Juncus* spp. Effort was focussed on the area near the outlet.

Figure 76: Local residents who helped the Project Officer hand-pull creeping water primrose at Round Pond on 3rd November 2010.

Following the volunteer work party the Project Officer concluded that hand-pulling was probably an effective method to help check the spread of the creeping water primrose in the vicinity of the outlet but considered that more drastic measures, such as scraping out the pond, would be required to eradicate the creeping water primrose. It appeared that the herbicide treatment undertaken at Round Pond had effectively killed creeping water primrose plants in areas where there was no rush *Juncus* spp; the Project Officer therefore considered that scraping out the pond would help increase the effectiveness of future herbicide treatments as a reduction in rush cover would increase the amount of chemical coming into contact with the creeping water primrose foliage. If the rush-dominated vegetation could be removed, any creeping water primrose plants which had not been killed by the herbicide treatment could then more easily seen and controlled with a regular hand pull.

Control of creeping water primrose during 2011

Hampshire & Isle of Wight Wildlife Trust were intending to trial the use of aquatic dye to eradicate New Zealand pygmyweed *Crassula helmsii* in New Forest ponds and sought advice from Dr Jonathan Newman of Waterland Management Ltd during February 2011 regarding the likelihood of aquatic dye being an effective method to control creeping water primrose in Round Pond. Dr Newman did not consider aquatic dye to be an effective potential method for eradicating creeping water primrose. He considered that it would respond to aquatic dye treatment by growing to the surface and becoming emergent; Dr Newman advised using 2,4-D amine on the floating 'rosette type' leaves at a concentration of 9 litres/hectare of product ('Depitox').

The Project Officer decided to continue with the glyphosate herbicide treatment using Roundup Pro Biactive and the adjuvant 'Topfilm' and proposed three herbicide treatments during August, September and October 2011.

By the beginning of August the water level in Round Pond had fallen, exposing the creeping water primrose and a date was set for the first treatment to take place in the first week of August.

On 18th August 2011 torrential rain was experienced in Hampshire and when Clive Chatters visited Breamore Marsh on 19th August, in the hope of undertaking his annual survey of *Cyperus fuscus*, the water level was far too high for herbicide treatment to be undertaken and he considered that 'a rather brutal approach' would be needed to control the creeping water primrose in Round Pond and prevent its spread (Figure 77).

Figure 77: Torrential rain fell in Hampshire on 18th August 2011. When this photograph was taken on 19th August 2011, the water level in Round Pond was uncharacteristically high for this time of the year.

Martin Rand, BSBI Vice County Recorder visited Breamore Marsh on 21st August 2011 and observed that the creeping water primrose was 'dominating tracts' of the south and west parts of the pond and 'although plants are still young and non-flowering' their vigour looked undiminished. Although the creeping water primrose was not covering the area where it had been most extensive during 2009 and 2010, he considered it had the potential to do so if not treated within the following few weeks. He offered to assist with hand-pulling during 2011 and wondered 'whether a hand-pull on a small contained site like this might be the most effective strategy'.

The unfavourable weather conditions prevented any herbicide treatment being undertaken during August 2011 and it was then not possible for the pond to be treated until September. By this time, the warm wet summer weather had caused the population of creeping water primrose to explode. However due to the drier weather earlier in the season only one or two upright flowering stalks were seen.

The first chemical treatment of the pond during 2011 took place on 16th September and further treatments were undertaken on 5th October and 28th October.

The Project Officer organised and led a volunteer work party to hand-pull the creeping water primrose on 1st November 2011. The work party was advertised on the notice board in a local village shop and a local resident also advertised the event in the parish magazine. A total of seven volunteers attended including Martin Rand the BSBI Vice County Recorder, a representative of the Environment Agency and five local residents who live adjacent to Breamore Marsh.

A total of forty refuse bags of creeping water primrose were removed. The Project Officer considered that hand pulling after the chemical treatment was very effective. At least 50% of Round Pond was tackled by the work party during November 2011 and hand-pulling was undertaken in the water where the pond had started to refill.

Control of creeping water primrose during 2012

During 2012 'Source to Sea' was initiated by Wiltshire Wildlife Trust as a collaborative project to stop the spread of invasive non-native plants in the River Avon catchment and from Spring 2012 Jo worked as a Field Officer with Source to Sea, whilst continuing to be employed by Hampshire & Isle of Wight Wildlife Trust. Further work to control the creeping water primrose at Breamore Marsh was organised by Jo through Source to Sea until the end of March 2015. Herbicide treatments, combined with hand-pulling, were planned for 2012. However, during summer and autumn 2012 Hampshire experienced very high rainfall and consequently the water level in Round Pond was too high for any herbicide treatment to be undertaken that year. The following photographs, taken at Breamore Marsh on 9th September 2012, indicate the height of the water and the growth of the creeping water primrose (Figure 78). The lack of herbicide treatment during 2012 allowed the creeping water primrose to grow profusely

Figure 78: Round Pond on 9th September 2012. Water levels remained too high for herbicide treatment to be undertaken during 2012.

Control of creeping water primrose during 2013

Due to herbicide treatment being so weather-dependent, it was decided that a new approach was needed to control the creeping water primrose at Breamore Marsh.

Hampshire & Isle of Wight Wildlife Trust invited Johan van Valkenburg of The Netherlands Plant Protection Service (one of the partners in the RINSE Project as described in section 8 of this report) to visit Breamore Marsh on 21st March 2013 to give advice on eradicating the creeping water primrose.

In the light of his experience, Johan recommended that successful eradication of the creeping water primrose at Breamore Marsh would necessitate dredging Round Pond to a depth of 30cm and disposing of the excavated material.

Advice provided by Johan van Valkenburg during site visit on 21st March 2013:-

- removal of bushes and brambles growing around the margin of Round Pond (as such vegetation is likely to be harbouring creeping water primrose) and spot-treat any creeping water primrose (revealed after the removal of the bushes and brambles) with herbicide;
- excavation Round Pond to a depth of 30cm during July (prior to growth of creeping water primrose accelerating during August and September), taking extreme care to avoid inadvertently spreading fragments of creeping water primrose during the dredging operation;
- burial of contaminated soil and vegetation on site.

Although burial of contaminated soil and arisings on site would significantly reduce the cost of disposal of the arisings, it was noted that burying the excavated material on site might not be realistic due to the impact on the Site of Special Scientific Interest, aesthetic considerations and the attitude of the landowner and local residents. Consideration would therefore need to be given to identifying a suitable site to dispose of the excavated material.

Johan emphasised the need for biosecurity during the dredging operation and during the disposal of arisings to prevent fragments of vegetation causing further contamination. He also stressed the need for the person undertaking the dredging to work meticulously to ensure that all fragments of creeping water primrose were removed from Round Pond; he stated “a job half done is no good whatsoever; if you do anything you have to do it rigorously”.

Following the site visit on 21st March 2013 consideration was given to the need to:

- continue with herbicide treatment during 2013 (as feasible, depending on water levels in late summer/early autumn 2013);
- investigate the feasibility of dredging Round Pond;
- explore proposals for dredging and disposal of arisings with landowner, local residents and relevant statutory authorities (Natural England, Environment Agency and local planning authority);
- secure necessary permits, authorisations, consents from relevant statutory authorities;
- secure necessary funding.

With funding from Natural England Jo arranged for Neil Sanderson (Neil Sanderson Botanical Survey and Assessment) to undertake a botanical survey of the ponds on Breamore Marsh (Sanderson, 2013a). The survey was undertaken during July and August 2013 as a baseline survey prior to the proposed excavation of Round Pond.

The survey revealed that vegetation dominated by creeping water primrose and New Zealand pygyweed *Crassula helmsii* had displaced mud annual communities (Figure 79 and Figure 80).

During summer 2013 three potential disposal sites were identified. Two sites were rejected due to their distance from Breamore Marsh mainly because of the increased transport costs and the risk of contamination. The third site was a small field containing a disused quarry a short distance from Breamore Marsh. The field was in cultivation but would have been harvested before the excavation work was due to be undertaken. This site was selected as the preferred option as it presented the least risk of contamination/inconvenience and the transport costs would be lowest due to its proximity to Breamore Marsh.

Figure 79 Round Pond photographed during July 2103 showing vegetation dominated By creeping water primrose and New Zealand pygmyweed that had displaced mud annual communities (Photograph: Neil Sanderson).

Figure 80 Creeping water primrose in Round Pond during July 2013 (Photograph: Neil Sanderson).

A meeting was held in July 2013 with the Environment Agency to view the potential disposal sites and site meetings were held in July and September 2013 to obtain quotes from contractors.

On 9th October 213 the Environment Agency wrote to HIWWT to confirm that the proposal to spread the arisings on the field (to confer benefit to the agricultural land) had been registered as 'exempt' under The Environmental Permitting (England and Wales) Regulations 2010.

It became apparent that it would be too late in the season for any mechanical excavation to be undertaken during 2013 and that there were still numerous questions that needed to be answered. Also, there was uncertainty about whether the funds would still be available to pay for the excavation. Because of these uncertainties and the change in the weather, herbicide treatments were undertaken on 24 September and 16 October 2013 and the funds for the excavation work were rolled over to the following year.

Control of creeping water primrose during 2014

It became apparent that the waste exemption which had been granted by the Environment Agency during 2013 to allow for the excavated material to be spread on the selected field would not be adequate as the field was not large enough to fulfil the waste exemption conditions. Jo therefore approached the Environment Agency and suggested that instead of spreading the arisings on the field, they could be put in the existing hollow.

This approach would be advantageous as a) the field would not have to be taken out of cultivation for one to two years to prevent fragments of creeping water primrose spreading to other areas on the wheels of agricultural machinery and b) it would avoid the biosecurity risk posed by wet areas which had formed within the field during Spring 2013. However if the arisings were to be disposed of in the hollow rather than being spread of the field, the work could not be undertaken in accordance with the waste exemption. An application for an environmental permit would need to be submitted to the Environment Agency which would have cost many thousands of pounds and would have taken a significant amount of time to organise.

To overcome this problem, Trevor Renals, the Environment Agency's Chief Technical Adviser, successfully instigated a change of policy at a national level within the Environment Agency regarding disposal of material that contains invasive non-native species such as creeping water primrose. This enabled the staff at the Environment Agency's local office to issue a Local Enforcement Decision. Local Enforcement Decisions are applied on a case-by-case basis. It was then possible for the arisings to be disposed of in the hollow without the need for an environmental permit.

As the excavated material was now to be regarded as waste, it was necessary to apply for planning permission from Hampshire County Council. Planning permission was granted on 28th October 2014.

An evening meeting was held on 4th September 2014 to discuss the proposed excavation work and to explain the importance of Breamore Marsh SSSI. The meeting was attended by over 20 people including local residents, the landowner and representatives of HIWWT and Natural England.

Consent was granted by Natural England on 8th September 2014 in accordance with the Wildlife and Countryside Act 1981 for the proposed excavation of material from Breamore Marsh SSSI.

During 2013 a site visit had been undertaken to assess Round Pond as a suitable habitat for the great crested newt which is a protected species. This appraisal had concluded that Round Pond would not be suitable for great crested newts due to its ephemeral nature as it dries out each year. During 2014 Hampshire & Isle of Wight Wildlife Trust's Ecology Team decided to undertake a survey of the ponds on Breamore Marsh to determine the presence of great crested newts and the invasive non-native signal crayfish.

Although no signal crayfish were found, a small population of great crested newts was present. It was therefore necessary to apply for a licence to translocate the great crested newts. The licensing process usually takes at least 60 days but Natural England fast-tracked the process and the licence was granted in less than 30 days.

Prior to the newt translocation, a fence had to be erected. To reduce costs, this was done in-house by Wildlife Trust staff and volunteers from Blashford Lakes Education Centre. The 380m fence and translocation buckets (pitfall traps) were installed between 9th and 11th September 2014 (Figure 81).

The great crested newt translocation began on 12th September 2014.

The site was visited twice a day to check for the presence of newts. All caught newts were removed from the pitfall traps and re-located around Long Pond approximately 80 metres to the south east of Round Pond. It was necessary to have 5 clear days without finding newts (ie 5 'zero capture days') after 30 days following the start of the translocation. If the overnight temperature dropped below 5 degrees centigrade then that day did not count and if a great crested newt was found then that day was also discounted. The translocation exercise was completed on Friday 24 October 2014 (due to 9 nights when the temperature was below 5 degrees centigrade) only three days before the contractors were due to begin the excavation on the following Monday morning (Jackson, 2014).

Prior to the excavation work, Wildlife Trust staff and volunteers cleared areas of bramble from the edge of Round Pond between 20th and 22nd October 2014 to facilitate access for the contractors and reduce the likelihood of creeping water primrose being hidden by scrub.

During 2013 a number of contractors had been asked to quote for the excavation work. In summer 2014 one of the contractors was instructed to undertake the work but unfortunately due to delays and the uncertainty regarding the start date, that contractor pulled out and an alternative contractor had to be found. A further three contractors were asked to quote. Aquascience Ltd was commissioned to undertake the excavation as this company had experience of invasive non-native species eradication and demonstrated a sound awareness of the need for biosecurity.

Excavation began on 27th October 2014 and was undertaken over a period of 12 days; it was completed on 11th November 2014. Work was undertaken on week days between 8am and 5pm to minimise the impact on local residents and had to be undertaken within the confines of the newt translocation fence (Gore, 2015).

Figure 81: Wildlife Trust staff and volunteers installing the fence around Round Pond (Photograph: Sarah Jackson).

Using a long-reach excavator the silt was removed to the gravel bed (to an average depth of 30cm and deposited at the edge of the pond to dry. The arisings were collected by a wheeled dumper and a mini digger and the edges of the pond were scraped back by 1m to ensure that any remnants of creeping water primrose growing in the marginal vegetation were removed. A small bund was created, behind which the arisings were piled. This allowed for further drying of the excavation material. A platform of sleepers and mesh was created as a turning area to minimise the impact of the tractor and trailer on the SSSI. This also ensured that the wheels of the tractor did not come into contact with contaminated material which could have been transported out on to the road.
The arisings were transported by a tractor and sealed trailer to the disposal site. To increase efficiency, a tracked dumper and another long-armed excavator were brought in to speed up the collection of the silt to the point where it was being loaded into the trailer. This reduced waiting times and kept the works on schedule (Figure 82, Figure 83, Figure 84, Figure 85).

Figure 82: Excavation of Round Pond during 2014 (Photograph: Jo Gore).

Figure 83: Excavation of Round Pond during 2014 (Photograph: Jo Gore).

Figure 84: Excavation of Round Pond during 2014 (Photograph: Jo Gore).

Figure 85: Tractor and trailer being loaded (Photograph: Jo Gore).

Exactly 100 trailer loads of arisings were transported to the disposal site. At the end of each day the road was swept to remove any mud which had dropped from the wheels of the tractor. The entrance in the fence was reinstated each evening to ensure that any protected species did not enter the working area.

Whilst material was being excavated from Round Pond, the contractors were also preparing the disposal site. A mini digger was used to create a bund to protect nearby trees and to ensure that the arisings remained within the hollow to reduce the biosecurity risk.

Control of creeping water primrose during 2015

The capping of the disposal site could not take place immediately after the excavation work was completed, due to unfavourable ground conditions. The disposal site was capped on 5th and 6th February 2015 using at least 20cm of material which had been scraped from the site.

Following the excavation work, regular surveillance at Breamore Marsh was undertaken by the Project Officer to remove any floating fragments of creeping water primrose. A screen which had been installed to prevent plant fragments flowing from the pond was changed on a weekly basis to ensure that water flow was not impeded.

Control of creeping water primrose during 2016

During 2016 Jo Gore visited Breamore Marsh to monitor and remove creeping water primrose:

- 9th June 2016 – the amount of creeping water primrose which was found on 9th June in Round Pond filled a horse feed tub (Figure 86). The plants were mainly seedlings or rooted fragments. Any larger plants (of which there was a minimal amount) were dug up with a trowel.
- 7th July 2016 - the amount of creeping water primrose which was found on 7th July in Round Pond filled approximately one third of a horse feed tub. No creeping water primrose was growing in the centre of Round Pond; the only creeping water primrose plants found were mainly seedlings or plants growing from fragments washed up on the margins of the pond. The occasional more deeply-rooted plant was removed with a trowel.
- 23rd August 2016 – Jo Gore visited Breamore Marsh with a volunteer who discovered creeping water primrose also growing in an adjacent pond (referred to as Lower Pond). The patch in Lower Pond was approximately 2 x 3 metres which was too large for it to be removed in its entirety. In the circumstances plants were removed from the outer edge of the patch.
- 8th September 2016 – during inspection with a contractor two further similar-sized patches of creeping water primrose and a few isolated plants were found in Lower Pond.
- 15th September 2016 – 3 seedlings and one patch approximately 30cm x 30cm were removed from Round Pond by hand pulling. Herbicide treatment was undertaken in Lower Pond on three patches of creeping water primrose, each approximately 2m x 3m. A few individual plants of creeping water primrose found in the ditch flowing from Lower Pond towards the road were removed by hand or treated with herbicide. One plant of creeping water primrose was found in the ditch which connects Round Pond to Lower Pond.
- 21st October 2016 – herbicide treatment in Lower Pond.
- 3rd November 2016 – hand-pull in Round Pond.

Figure 86: Horse feed tub used to collect creeping water primrose during monitoring visits to Breamore Marsh (Photograph: Jo Gore).

Control of creeping water primrose during 2017

During 2017 Jo Gore visited Breamore Marsh to monitor and remove creeping water primrose:

- 18th May 2017 – 5 small stalks of creeping water primrose found in Round Pond. The water level was too high for Lower Pond to be checked effectively. Areas treated with herbicide in 2016 appeared to have responded well with little or no re-growth.
- 2nd June 2017 – Jo had a site meeting with Environment Agency staff who were pleased that the vegetation in Round Pond had recovered so well after the excavation work in 2014.There was plentiful toad and frog spawn. Moorhens were nesting on the pond and there were numerous dragonfly species using the pond. Clive Chatters had reported that the brown galingale populations had greatly improved, with a quick count revealing at least 50 individual plants. In previous years the annual surveys had revealed populations of only one or two plants and for many years brown galingale had been absent from Round Pond. Five 'small sprigs' of creeping water primrose were found in Round Pond; 3 or 4 'strands' of creeping water primrose were found in Lower Pond but Jo was unable to reach them due to muddy conditions.
- 8th June 2017 – boards were used to walk across the mud to hand pull creeping water primrose in Lower Pond.
- 29th June 2017 – 2 'sprigs' of creeping water primrose found in Round Pond. 6 'small strands' found in Lower Pond.
- 20th July 2017 – no creeping water primrose found in Round Pond but a few 'sprigs' were found in Lower Pond.
- 3rd August 2017 – a 'few small sprigs' of creeping water primrose were found in Round Pond. No creeping water primrose found in Lower Pond but water levels had risen.
- 14th September 2017 – after a 6 week gap in visits, a 'full tub' of creeping water primrose was pulled up from Round Pond. Most of these plants were in an area that had been under water at the time of the previous visit on 3rd August 2017 and had since dried out. This highlights the importance of visiting every two weeks to keep on top of the amount of biomass produced during this peak period of growth.
- 22nd September 2017 – creeping water primrose was found within large mounds of *Crassula helmsii* at the edge of Round Pond. Also some fragments of creeping water primrose were found, for the first time since the excavation work, in exposed areas in the middle of the pond. The margins of Round Pond had become increasingly more difficult to check due to the colonisation by native plants and extensive areas of *C. helmsii*. One flowering plant of creeping water primrose and 'a few small sprigs' of creeping water primrose were found in Lower Pond which was sufficiently dry to be monitored but where dense growth of water mint affected the thoroughness of the search.
- 9th October 2017 – one third of a tub of creeping water primrose was found in Round Pond, including plants growing on the exposed areas within the pond. The water mint had started to die down in Lower Pond where, after a thorough search, only one small 'strand' of creeping water primrose was found.
- 2nd November 2017 – 4 'small sprigs' of creeping water primrose found in Round Pond. No creeping water primrose was found in Lower Pond.
- 15th November 2017 – 'a couple of sprigs' of creeping water primrose were found in Round Pond. The disposal site was monitored; it 'had remained stable and intact'.

Control of creeping water primrose during 2018

During 2018 Jo Gore visited Breamore Marsh to monitor and remove creeping water primrose:

- 17th May 2018 – water level was too high for monitoring to be undertaken.
- 14th June 2018 – water level was still high which made monitoring difficult. 12 'small strands' of creeping water primrose were found in Round Pond. It was impossible to monitor Lower Pond.
- 5th July 2018 – 15 'strands/seedlings' of creeping water primrose found in Round Pond, all confined to the margins of the pond but not confined to one particular area. Part of Lower Pond was monitored but high water level and dense growth of water mint prevented a thorough check.
- 19th July 2018 – approximately 20 'strands' of creeping water primrose were removed. No creeping water primrose found in Lower Pond.
- 16th August 2018 – water level in Round Pond had fallen but was still higher than normal and 'vast amounts' of *C. helmsii* hampered surveillance. One flowering plant of creeping

water primrose was found amongst marginal vegetation. In total approximately 15 – 20 plants of creeping water primrose were found, filling approximately one third of a tub. Some creeping water primrose was found in a moorhen nest and some found within *C. helmsii*. No creeping water primrose was found in Lower Pond.

- 3rd September 2018 – 5 'sprigs' of creeping water primrose found in Round Pond and one 'sprig' found in Lower Pond.
- 20th September 2018 – 'one strand and one sprig' of creeping water primrose found within *C.helmsii* in Round Pond. No creeping water primrose found in Lower Pond.
- 11th October 2018 – no creeping water primrose found in Round Pond or Lower Pond. *C.helmsii* very dominant in Round Pond and also present in Lower Pond.

Control of creeping water primrose during 2019 (Figure 87)

During 2019 Jo Gore visited Breamore Marsh to monitor and remove creeping water primrose:

- 17th May 2019 – one small plant found in Round Pond, suspected to be creeping water primrose. Water level too high for Lower Pond to be monitored.
- 13th June 2019 – no creeping water primrose found in Round Pond. Water level too high for Lower Pond to be monitored.
- 19th July 2019 – 2 'sprigs' of creeping water primrose found in Round Pond which was almost completely dry. 1 'sprig' of creeping water primrose and two areas approximately 30cm in diameter found in Lower Pond which was dry enough to walk on but where tall growth of water mint hindered thorough checking (Figure 88).
- 15th August 2019 – one 'small sprig' of creeping water primrose found in Round Pond. None found in Lower Pond.
- 12th September 2019 – no creeping water primrose found in Round Pond or Lower Pond. Grazing by cattle had reduced the height of the water mint in Lower Pond, thereby enabling a more thorough search to be undertaken.
- 15th October 2019 – 1 'small sprig' of creeping water primrose found in Round Pond (Figure 89). None found in Lower Pond. A small amount of the invasive non-native water fern *Azolla filiculoides* was found in Round Pond.
- 12th November 2019 – Round Pond checked for final time during 2019

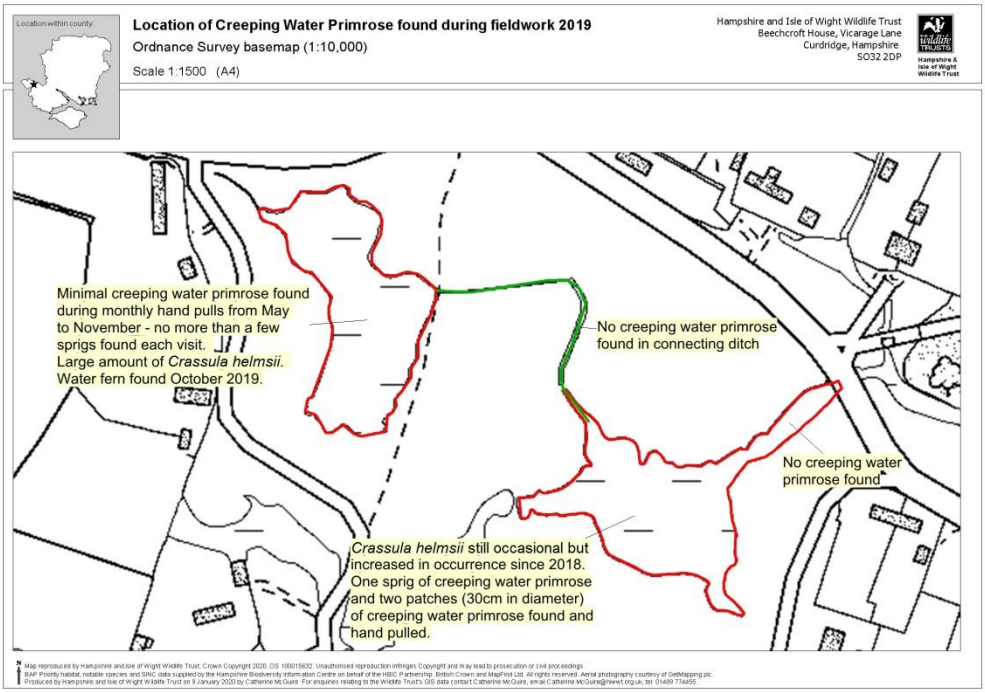


Figure 87: Creeping water primrose found at Breamore Marsh during monitoring visits in 2019.

Left – Figure 88: The creeping water primrose removed from Lower Pond on 19th July 2019 (Photograph: Jo Gore).

Right- Figure 89: The single 'sprig' of creeping water primrose found in Round Pond during monitoring visit on 15th October 2019 (Photograph: Jo Gore).

5.4.5. Conclusions

In conclusion, the work undertaken by the NFNNPP and Source to Sea has resulted in a significant reduction in the amount of creeping water primrose on Breamore Marsh SSSI. In contrast to the extensive areas dominated by creeping water primrose as shown in Figures 69, 70, 78 and 79 prior to the excavation work undertaken in 2014, only small amounts of creeping water primrose were found during the subsequent monitoring visits. As demonstrated in Figure 88 only a single shoot of creeping water primrose was found in Round Pond during the monitoring visit on 15th October 2019 and no creeping water primrose was found on Breamore Marsh during the final monitoring visit of the season on 12th November 2019.

The problems encountered whilst arranging the proposed excavation of Round Pond led to a change in the Environment Agency's national policy and procedures regarding the disposal of excavated material containing invasive non-native plants. Previously an environmental permit would have been required by the Environment Agency which would have added considerably to the cost of the excavation. The Environment Agency's change in policy will be of benefit to similar schemes in the future.

The Great Britain Invasive Non-Native Species Strategy (DEFRA, 2015) highlights the problems caused by creeping water primrose and states that 'it spreads rapidly by vegetative fragments and forms dense carpets that exclude nature biodiversity, increase flood risk and siltation and degrade amenity value'.

The Strategy emphasises the importance of responding rapidly to outbreaks of creeping water primrose and states 'the total cost of water primrose eradication if it became widespread is estimated to be around £250 million. Acting now is saving many millions of pounds in later control and management costs'.

This case study therefore highlights the benefits of Local Action Groups responding quickly when alerted to the presence of invasive non-native plants.

The work undertaken on behalf of the NFNNPP and Source to Sea has prevented the spread of creeping water primrose from Breamore Marsh into the River Avon which is of national and international ecological importance, thereby avoiding extremely serious environmental, economic and social problems (Chatters and Gore, 2019).

5.5. Floating Pennywort on The Cadnam River as an Example of a Rapid Response

The important role of the New Forest Non-Native Plants Project as a Local Action Group in responding rapidly to outbreaks of invasive non-native species is demonstrated by this case study relating to the discovery of floating pennywort on the Cadnam River.

5.5.1. Description of the Cadnam River as a tributary of the River Test

The Cadnam River is a tributary of the River Test. It rises in the New Forest, upstream of Cadnam and flows through Crown Land on the Open Forest and through privately-owned land before its confluence with the River Blackwater (Figure 90).

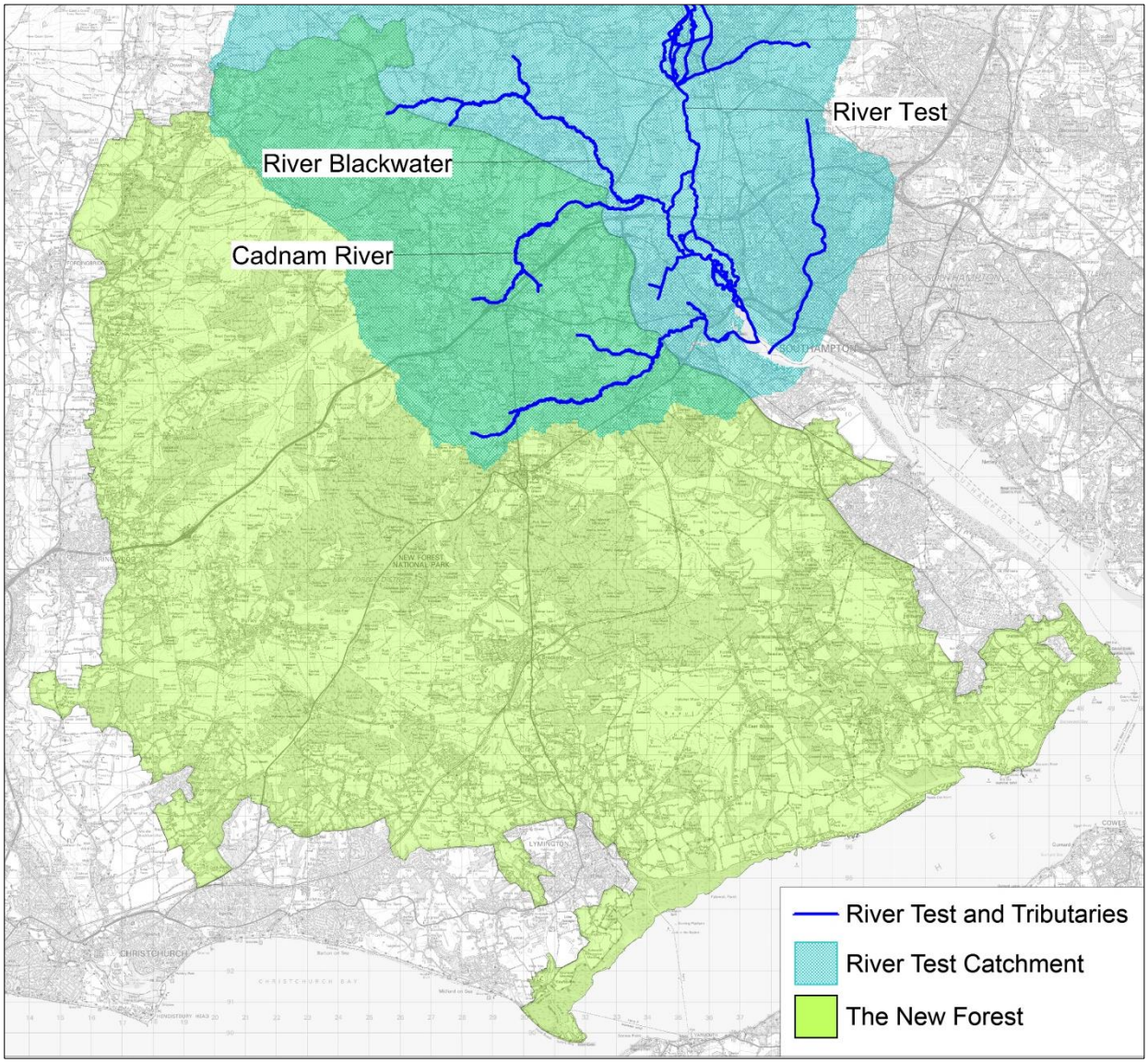


Figure 90: The location of the Cadnam River as a tributary of the River Test.

5.5.2. The ecological importance of the River Test

The River Test is recognised as being of national and international ecological importance through its designation as River Test SSSI, Lower Test Valley SSSI and its inclusion within the Solent and Southampton Water SPA and the Solent Maritime SAC.

5.5.3. Floating pennywort in the Cadnam River

Floating pennywort is a highly invasive non-native species for which an Invasive Species Action Plan is currently being developed. Invasive Species Action Plans are used to coordinate the response to key invasive non-native species across England, Wales and Scotland. To date, Species Action Plans have been written for 6 key species and the GB Programme Board for non-native species has asked for Invasive Species Action Plans to be developed for 5 further key species, one of which is floating pennywort.

During autumn 2017 the Project Officer was contacted by a local resident who reported a sighting of floating pennywort growing in the Cadnam River. On 3rd November 2017 the Project Officer visited the local resident who pointed out the suspected floating pennywort growing in the Cadnam River close to the opposite bank (Figure 91)

Figure 91: Floating pennywort growing close to left bank of the Cadnam River, photographed on 3rd November 2017.

A sample of vegetation was removed and the Project Officer confirmed its identification (Figure 92). It was fortunate that the local resident a) recognised floating pennywort as he had recently seen it highlighted in a television programme and b) took the initiative to contact the Project Officer whom he knew through previous contact regarding Himalayan balsam on the Cadnam River.

Figure 92: The Project Officer confirmed the identification of floating pennywort in the Cadnam River.

The Project Officer immediately contacted the relevant landowner who fortunately understood the potential impact of floating pennywort as he had also seen the problems caused by this species highlighted in a (different) television programme. The landowner recognised the importance of a rapid response and offered to help with its removal as soon as possible.

5.5.4. Control of floating pennywort in the Cadnam River

The Project Officer and the landowner met again later that day to check for floating pennywort along the section of river within his ownership. The majority of the floating pennywort was growing in a patch on the left bank as shown in Figure 91. A few isolated plants were found growing in the river, slightly further upstream.

The landowner walked along the top of the bank to look for isolated plants of floating pennywort whilst the Project Officer walked through the river and carefully removed them manually.

The main patch of floating pennywort had to be extremely carefully removed to minimise the risk of pieces of root, stem or leaves becoming detached. Great care was taken to ensure that any fragments of plant material were caught and did not float downstream (Figure 93).

Three plastic tubs and part of a plastic sack were filled with floating pennywort (Figure 94).

The Project Officer then sent an identification sheet and advisory note to all relevant riparian landowners along the Cadnam River and asked them to alert her if they found floating pennywort or any plants which they thought might be floating pennywort. To date, no-one has reported any further sightings of floating pennywort on the Cadnam River.

Figure 93: The Project Officer removing floating pennywort from the Cadnam River on 3rd November 2017.

Figure 94: The landowner and the Project Officer with the floating pennywort removed from the Cadnam River on 3rd November 2017.

5.5.5. Conclusions

The work of the NFNNPP, in close co-operation with local residents/landowners, has therefore prevented the spread of floating pennywort further downstream into the ecologically sensitive habitats of the River Test.

This case study demonstrates the importance of responding rapidly to a report of an invasive non-native species to 'nip it in the bud' and prevent it spreading further downstream. It highlights the importance of tackling a recent invasion of a non-native species at the stage when it can be eradicated before the population increases to a level here eradication is costly, difficult or impossible.

This case study also highlights the benefits of effective awareness-raising. The local resident who first spotted the floating pennywort growing on the Cadnam River and the landowner on whose property it was growing had both seen television programmes which featured floating pennywort and which emphasised the highly invasive nature of this species and the problems it can cause.

As the Project Officer had previously made contact with landowners along the Cadnam River in relation to control of Himalayan balsam and had regularly keep in touch with them through the Project's newsletters, the local resident who noticed the floating pennywort had the Project Officer's contact details and was able to alert her promptly.

This case study also demonstrates the benefits of a Local Action Group such as the NFNNPP developing a good working relationship with landowners. The Project Officer was able to secure the trust and co-operation of the landowner and was therefore able to take prompt practical action in response to receiving the report of this species growing in the Cadnam River.

6. RESEARCH

6.1. Research Commissioned by the New Forest Non-Native Plants Project

6.1.1. Control of New Zealand pygmyweed

New Zealand pygmyweed (Figure 95) has rapidly colonised ecologically important wetland habitats in the New Forest area since it was first recorded here in 1976. Previous attempts to control it have involved treating it with herbicide, covering it in black plastic, burning it with a flame-thrower and freezing it with liquid nitrogen.

The NFNNPP commissioned research to investigate the effectiveness of 'novel' control techniques involving organic foam and aquatic dye compared with herbicide treatment involving Roundup Pro-Biactive. The aim of the research was to find a way of controlling New Zealand pygmyweed effectively and efficiently, without causing a long-term detrimental effect on the native non-target plants and invertebrates. It is thought that New Zealand pygmyweed does not produce viable seed in the UK, whereas the native plants would be able to re-colonise the trial sites due to germination of the buried seed bank.

Figure 95: New Zealand pygmyweed *Crassula helmsii* (Photograph: Peter Llewellyn / Great Britain Non-Native Species Secretariat).

During 2009 and 2010 the NFNNPP commissioned Dr Naomi Ewald (University of Sussex) to map the current distribution of New Zealand pygmyweed in New Forest ponds and to select suitable sites for the three treatments. Trial sites for hot foam and herbicide treatment would need to dry out during the late summer/early autumn, whereas the trial sites for the aquatic dye would need to retain water at the appropriate season.

Following selection of trial sites by Dr Naomi Ewald, contractors were commissioned to undertake the trials using hot foam (Figure 96), aquatic dye (Figure 98 & 99) and herbicide. The trials commenced in September 2011. Further hot foam and herbicide treatment was planned for August and September 2012 but, due to high rainfall that year, the trial sites remained too wet for treatment to be undertaken. During 2012 only aquatic dye trials were undertaken. Trials involving hot foam (Figure 97) and herbicide treatment were undertaken in August and September 2013 and aquatic dye treatment was also undertaken that year.

Figure 96: Application of hot foam to New Zealand pygmyweed at Abbot's Well on 14th September 2011.

Figure 97: Application of hot foam to New Zealand pygmyweed at Hill Top Pond on 20th September 2013.

Figure 98: Application of aquatic dye to pond at Mogshade on 14th December 2011.

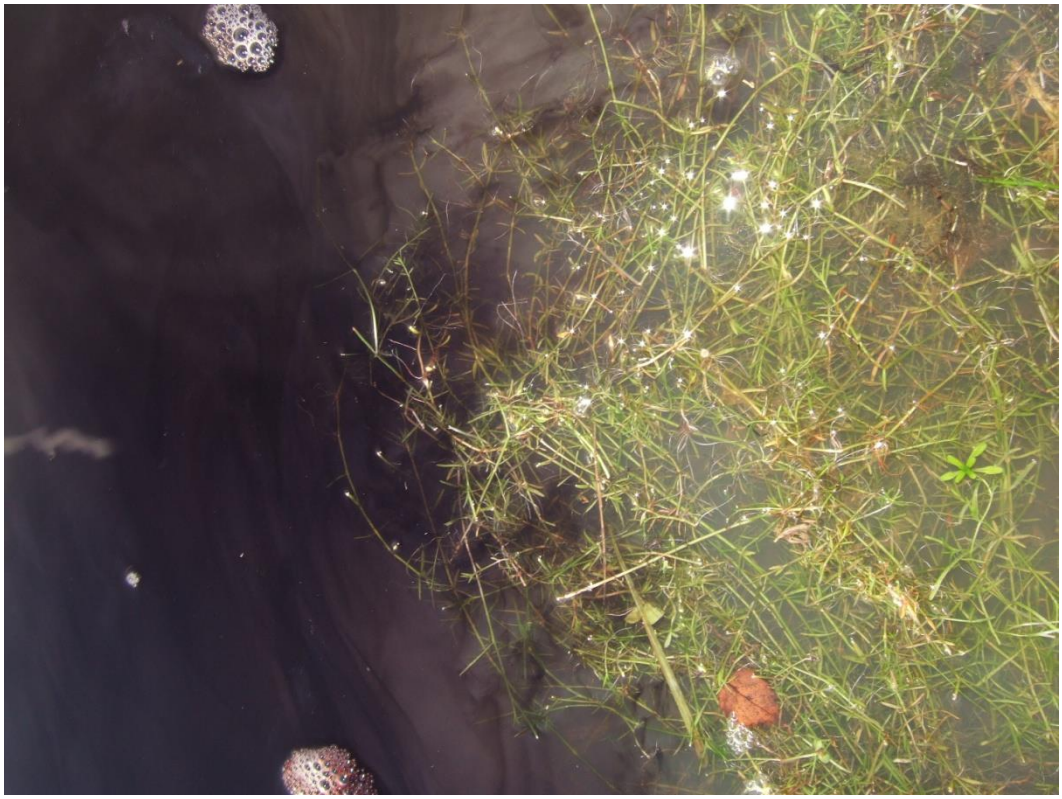


Figure 99: Aquatic dye applied to water at pond at Abbot's Well on 14th December 2011.

The results of the trials were monitored by Dr Naomi Ewald (Pond Conservation / Freshwater Habitats Trust) to assess the effectiveness of the three treatment methods and the impact, if any, on the native non-target species.

The results are available in the Freshwater Habitats Trust report (Ewald, 2014a) and accompanying annexe.

6.1.2. The quality of habitats affected by pitcher plant at Holmsley Bog

Neil Sanderson was commissioned to prepare a report highlighting the quality of the habitats affected by pitcher plant *Sarracenia purpurea* at Holmsley Bog. The report (Sanderson, 2012) describes the habitats at Holmsley Bog in a national and European context.

6.1.3. The impact of American skunk cabbage on native vegetation

American skunk cabbage is extremely invasive in wet woodlands in the New Forest area but is not listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and, at the start of the Project, its impact on semi-natural habitats did not appear to be widely known.

During 2012, recognising the need to raise awareness about the impact of this species, the Project Officer commissioned Neil Sanderson (Neil Sanderson Botanical Survey and Assessment) to assess the impact of American skunk cabbage on the native vegetation of two wet woodlands in the New Forest, namely Harcourt Wood near Minstead and the Trust's Lymington Reedbeds nature reserve. The results are available in the report dated January 2013 (Sanderson, 2013b).

The report demonstrates that as the cover of American skunk cabbage increases the number of other species declines (Figure 100) and concludes that American skunk cabbage is "an invasive non-native species which is a considerable threat to high quality native wet woodland habitat, a BAP (Biodiversity Action Plan) habitat. This includes at least one Annex 1 Priority Habitat (91E0 * Alluvial Forests) and data from Germany suggest that another (91D0 * Bog woodland) is vulnerable. Mature skunk cabbage colonies form large dense patches, which suppress large areas of the native ground flora. Initial colonisation is slow but exponential expansion probably occurs as numbers build up, ending with almost total ground cover."

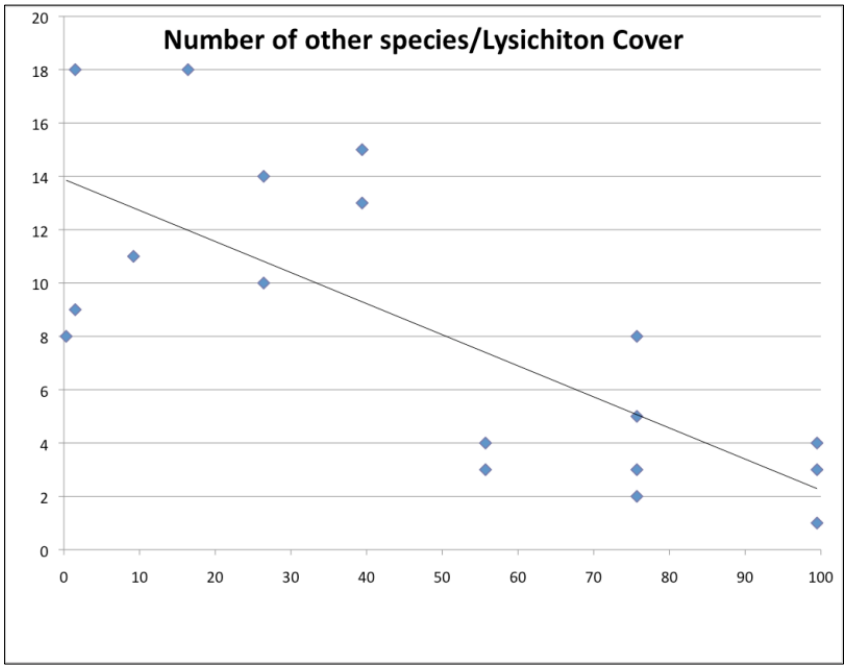


Figure 100: Extract from report by Neil Sanderson showing the number of other species per quadrat plotted against the cover of American skunk cabbage. This demonstrates that as the cover of American skunk cabbage increases the diversity of other species declines.

This report commissioned by the NFNNPP was successfully presented as evidence during the compilation of the list of Species of Union Concern in accordance with Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (the 'Invasive Alien Species Regulation'). American skunk cabbage was consequently included in the first list of Species of Union Concern which came into force on 3 August 2016.

6.1.4. The quality of habitats affected by Himalayan balsam

Neil Sanderson was also commissioned in 2012 by the NFNNPP to assess the quality of a variety of habitats which had been invaded by Himalayan balsam in the vicinity of the Lymington River and the Beaulieu River. The habitats surveyed included *inter alia* woodland, grassland, fen meadow and swamp. The results are available in a report dated January 2013 (Sanderson, 2013c).

6.2. Research Undertaken by the New Forest Non-Native Plants Project

6.2.1. Research relating to control of American skunk cabbage

The NFNNPP trialled the use of two herbicides (2,4-D amine and Roundup Pro-Biactive) during 2010 to compare their effect on American skunk cabbage within the Trust's Lymington Reedbeds nature reserve. The results of the trial were monitored by Tom Fox and Athene Gadsby, as mentioned in section 6.3 of this report, and their research indicated that Roundup Pro-Biactive was more effective than 2,4-D amine (Gadsby & Fox, 2010).

6.2.2. Research relating to motivation of volunteers

During 2013 the Project Officer sent questionnaires to a selection of people who had volunteered to pull Himalayan balsam with the NFNNPP, to find out what motivated them to volunteer. The results were summarised in a report dated February 2013 (Chatters, 2013a).

6.2.3. Research relating to control of Cotoneaster

During 2018 the NFNNPP accepted the offer of Alan Martin to trial the use of 'Tree Poppers' to pull up Cotoneaster. The trial was undertaken jointly with Lucy Andrews of the Forestry Commission on part of the former WWII airfield at Stoney Cross which supported numerous plants of wall cotoneaster *Cotoneaster horizontalis* (Figure 101). As a result of the trial the NFNNPP concluded that any advantages of using Tree Poppers to remove Cotoneaster were outweighed by the disadvantages.

Figure 101: Alan Martin and Lucy Andrews photographed on 16th November 2018 trialling the use of a Tree Popper to control *Cotoneaster horizontalis.*

6.3. Research Undertaken by Students and Volunteers on Behalf of the Project

The NFNNPP has benefited from research undertaken by students, recent graduates and other volunteers who have undertaken surveys and monitored the effect of work to control invasive non-native species.

Research undertaken during 2009

As mentioned in section 5.1.5 of this report, Simon Kain and Phil Latto (Figure 102), recent graduates of the University of Southampton, surveyed a number of watercourses on Crown Land within the New Forest to map the presence of invasive non-native species (Kain & Latto, 2010).Their work was particularly helpful as it enabled the Project Officer to focus effort to control Himalayan balsam in future years.

Figure 102: Simon Kain and Phil Latto, recent graduates of the University of Southampton, undertook surveys on behalf of the Project during 2009.

As mentioned in section 5.2.4 of this report, on 15th September 2009 Oliver Wilkins, a horticultural student, helped the Project Officer map the distribution of American skunk cabbage in the Trust's Lymington Reedbeds nature reserve.

Research undertaken during 2010

Tom Fox and Athene Gadsby, recent graduates of the University of Southampton, helped the NFNNPP by surveying the following watercourses on Crown Land:

- Highland Water
- Deadman Bottom
- Black Gutter
- Ditchend Brook
- Latchmore Brook
- Dockens Water
- Linford Brook
- Passford Water
- Ober Water
- Beaulieu River

Tom and Athene (Figure 103) also monitored the effectiveness of the trials undertaken in Lymington Reedbeds nature reserve earlier that year to control American skunk cabbage using 2,4-D amine and Roundup Pro-Biactive (Gadsby & Fox, 2010).

Figure 103: Tom Fox and Athene Gadsby monitoring the results of the trials to control American skunk cabbage during 2010.

Volunteer Ruth Kernohan (Figure 104) helped the Project Officer to map American skunk cabbage growing on privately-owned land within Lymington River Reedbeds SSSI on 27th May 2010.

Ruth also volunteered to research the history of landownership and fragmentation along the Avon Water.

With Alexander Bridges, a former student from Sparsholt College, Ruth studied the effect of strimming which had been undertaken to control Himalayan balsam downstream of Boldre Bridge on the Lymington River.

Figure 104: Ruth Kernohan helped the Project Officer to map American skunk cabbage.

Claire Shepherd, a student at the University of Southampton, and Alexander Bridges monitored the results of the herbicide treatments undertaken in 2010 to control parrot's feather at four locations in the New Forest and creeping water primrose at Breamore Marsh (Bridges and Shepherd, 2010)..

Research undertaken during 2011

Catherine Pascoe and Alexander Bridges monitored the results of the herbicide treatment to control parrot's feather at four sites in the New Forest during 2011 (Pascoe and Bridges, 2011).

Jessica Allan and Hannah Bye surveyed the Ripley Brook and the Clockhouse Stream on behalf of the NFNNPP during summer 2011 (Allan & Bye, 2011).

Research undertaken during 2012

Sam Hempenstall (Figure 105), an Ecology student at Bournemouth University, monitored the results of the herbicide treatment to control parrot's feather at four sites in the New Forest during 2012 (Hempenstall, 2012).

Figure 105: Sam Hempenstall monitored the control of parrot's feather.

Research undertaken during 2013

Marija Nilova and Louise Cooke (Figure 106), recent graduates of the University of Southampton, mapped the distribution of giant hogweed along the Avon Water (Cooke & Nilova, 2013).

Figure 106: Marija Nilova and Louise Cooke mapped giant hogweed along the Avon Water.

Research undertaken during 2016, 2017, 2018 & 2019 to assess the control of Cotoneaster

Volunteers have helped the Project Officer to record the distribution of Cotoneaster at a number of sites within the New Forest prior to herbicide treatment by contractors. Herbicide treatment commenced in 2016 and since then volunteers have spent a considerable amount of time helping the Project Officer each year to record the presence of Cotoneaster plants at sites which required further treatment at, for example, Beaulieu Heath, Crockford, Greenmoor, East Boldre, Lyndhurst, Bramble Hill and Stoney Cross (Figure 107). The monitoring has enabled maps to be prepared to help contractors locate Cotoneaster plants when they undertake herbicide treatment (Figures 108 and 109).

Figure 107: Volunteer monitoring the control of Cotoneaster at Stoney Cross in October 2018.

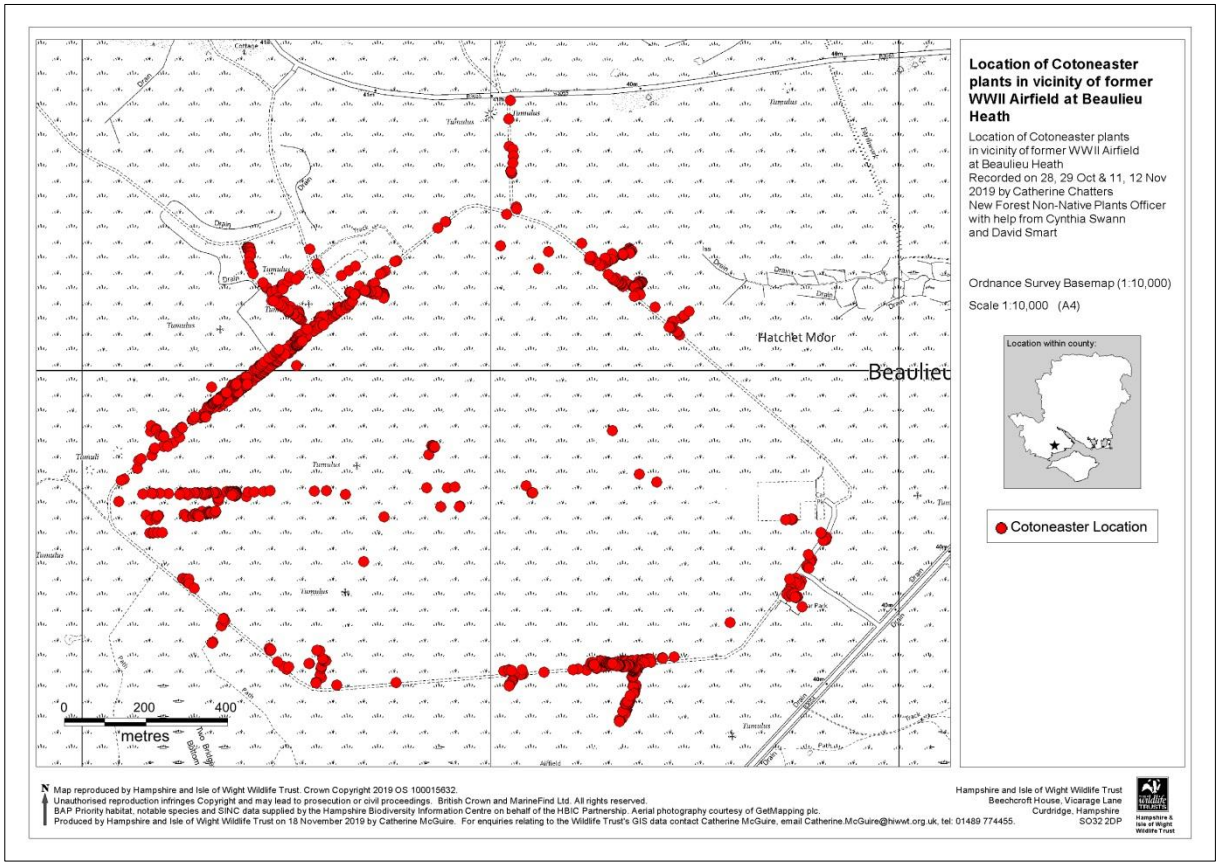
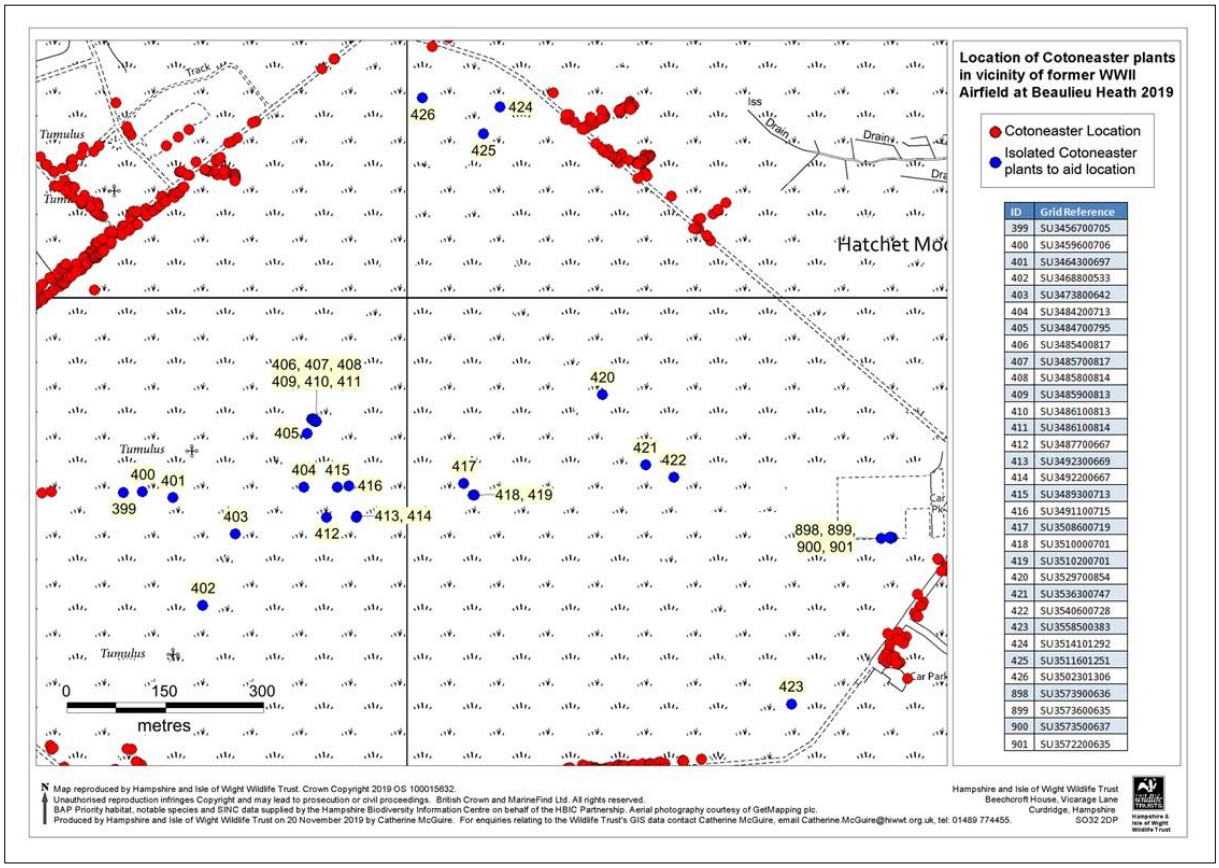


Figure 108: Map created following monitoring by volunteers at Beaulieu Heath in 2019.



ID	Grid Reference
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400	SU3459600706
401	SU3464300697
402	SU3468800533
403	SU3473800642
404	SU3484200713
405	SU3484700795
406	SU3485400817
407	SU3485700817
408	SU3485800814
409	SU3485900813
410	SU3486100813
411	SU3486100814
412	SU3487700667
413	SU3492300669
414	SU3492200667
415	SU3489300713
416	SU3491100715
417	SU3508600719
418	SU3510000701
419	SU3510200701
420	SU3529700854
421	SU3536300747
422	SU3540600728
423	SU3558500383
424	SU3514101292
425	SU3511601251
426	SU3502301306
898	SU3573900636
899	SU3573600635
900	SU3573500637
901	SU3572200635

Figure 109: Detailed Map created following monitoring by volunteers at Beaulieu Heath in 2019.

6.4. Research Undertaken by Students for their Dissertations

A number of students have approached the Project Officer to seek advice about research for their dissertations.

The following are a few examples:

- Charlotte Phillips, a MSc student at the University of Bristol, whose dissertation in 2011 investigated which factors make certain habitats susceptible to invasion by Himalayan balsam;
- Laura Downham, a student at Plymouth University, focussed her research in 2011 on American skunk cabbage in the New Forest area;
- James Farr, a mature student studying for a BSc at Sparsholt College during 2013, mapped the distribution of invasive non-native plants on the River Hamble;
- Jennifer Harrington whose research in 2013 focussed on land-use of sites invaded by giant hogweed along the Avon Water;
- Jessica Beare, studying for an MSc in Environmental Technology at Imperial College London, focused her research during 2014 on citizen science;
- Joshua O'Shaughnessy, of Keble College at the University of Oxford, undertook research in the New Forest during 2014. This involved mapping the distribution of Himalayan balsam along the Darkwater and a questionnaire to survey attitudes of volunteers.

6.5. Research Undertaken by Students to Assess the Effectiveness of Control Work

Through the 'Our Past, Our Future' Landscape Partnership scheme (as outlined in section 10 of this report), resources have been provided by the Heritage Lottery Fund / National Lottery Heritage Fund for control of Himalayan balsam, giant hogweed, American skunk cabbage and Japanese knotweed during 2016, 2017, 2018 and 2019.

To assess the effectiveness of the control work, a baseline survey and subsequent monitoring visits have been undertaken by placement students from the University of Southampton.

The Project Officer arranged for two placement students, Dominika Murienova and Rebecca Wilson, to undertake a baseline survey during 2015 (Figure 110).

During the baseline survey the students recorded:

- Himalayan balsam at three sample sites on the Lymington River, the Avon Water and the Cadnam River;
- giant hogweed at three sample sites along the Avon Water;
- Japanese knotweed at three sample sites along the Cadnam River;
- American skunk cabbage in wet woodland along the Fleet Water near Minstead (Figure 111).

The relative abundance of Himalayan balsam and American skunk cabbage was assessed using quadrats whilst Japanese knotweed stems and giant hogweed plants were counted individually. Observations were also made of native plants growing within the quadrats or in the vicinity of the Japanese knotweed and giant hogweed.

Since 2015, two other placement students from the University of Southampton were appointed to undertake monitoring each year at the ten sample sites.

The New Forest Non-Native Plants Officers are very grateful to the ten students who did the baseline survey in 2015 and undertook the monitoring in subsequent years:

- Dominika Murienova and Rebecca Wilson (Murienova and Wilson, 2015)
- Ben O'Hickey and Sophie Watts (O'Hickey and Watts, 2016)
- Jacob Middleton and Isobel Tickner (Middleton and Tickner, 2017)
- Ben McClay and Flora Level (McClay and Level, 2018)
- Sophie Minns and Rachael Anderson (Minns and Anderson, 2019)

Figure 110: Placement students Dominika Murienova and Rebecca Wilson at the Himalayan balsam survey site along the Cadnam River during June 2015.

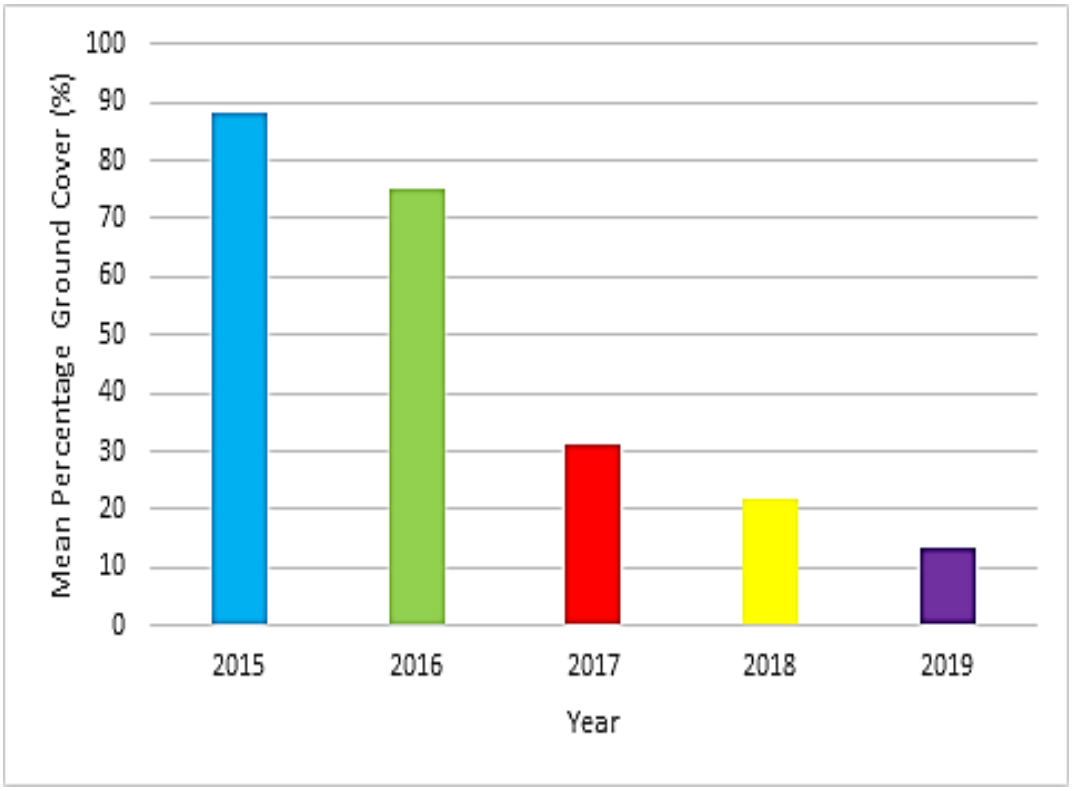

Figure 111: Decrease in percentage cover of American skunk cabbage in quadrats within Harcourt Wood along the Fleet Water near Minstead, revealed by the monitoring undertaken by placement students from the University of Southampton between 2015 and 2019.

7. RAISING AWARENESS

7.1. Techniques Used to Raise Awareness

The NFNNPP uses a variety of techniques to raise awareness about invasive non-native plants and the problems they cause.

The Project features on the Trust's website at www.hiwwt.org.uk/

Press releases are sent to relevant local newspapers and magazines to highlight notable achievements and activities and to recruit volunteers.

The Project Officer has been interviewed on Radio Solent on a number of occasions and was filmed for Breakfast TV to help promote the launch of the Government's 'Be Plant Wise' campaign during February 2010.

Opportunities are taken to mount displays at local events including the Trust's Wood Fair at Roydon Woods nature reserve and the Lymington to Keyhaven nature reserve open day jointly hosted by the Trust and Hampshire County Council (Figure 112).

During 2010 and 2011 the Project Officer created displays at the New Forest and Hampshire County Show (Figure 113). In 2011 the display involved the creation of two 'ponds', one planted with invasive non-native plants and one planted with native plants suitable for growing in garden ponds. The Project is grateful to Romsey World of Water for donating the native plants.

The Project Officers have regularly manned displays at the annual Volunteer Fair in Lyndhurst (Figure 114) to raise awareness about the Project.

Figure 112: The Project's display at the Lymington to Keyhaven nature reserve open day during 2016.

Figure 113: Part of the Project's display at The New Forest and Hampshire County Show in 2011.

Figure 114: Dr Julian Lewis MP meeting Jo Gore at the Volunteer Fair in January 2017.

The Project Officer organised a conference at Careys Manor Hotel in Brockenhurst on 4th November 2010. Speakers included author Richard Mabey, representatives from DEFRA, Great Britain Non-Native Species Secretariat and the Environment Agency, as well as a local landowner, researchers and academics.

The Project Officer has given presentations at conferences and workshops including:

- conference hosted by Institute of Ecologists and Environmental Managers (IEEM) on 15th June 2011: 'Biodiversity and The Big Society – Delivering Ecology and Nature Conservation from a Locally-Led Perspective';
- conference hosted by Sussex Wildlife Trust on 6th January 2012: 'Water and Wetlands: Key Issues and Future priorities for Sussex';
- conference hosted by British Ecological Society and University of Worcester on 25th March 2013: 'Management of non-native species in UK conservation';
- conference on 15th December 2015 hosted by the Medway Valley Countryside Partnership;
- Rother and Romney Catchment Partnership Stakeholder Workshop hosted by The High Weald AONB on 24th February 2016;
- NERC-sponsored research workshop on Himalayan balsam hosted by CABI, University of Reading and Royal Holloway, University of London on 9th January 2019.

Talks are given by the Project Officers to Parish Councils and a wide variety of local societies and community groups including gardening clubs, Wildlife Trust local groups, natural history societies and the Women's Institute.

The Project Officers have organised training sessions for relevant target audiences. For example:

- a training session for staff at New Forest District Council, Test Valley Borough Council and Eastleigh Borough Council on 5th March 2010;
- a training session for Environment Agency staff on 24th March 2010;
- a training session on plant identification on 30th March 2011;
- a training session on the control of invasive non-native plants on 2nd November 2011;
- a training session for Natural England staff on 11th December 2013;
- a training session for Forestry Commission staff on 11th February 2014.

7.2. Promoting Government Campaigns

The NFNNPP has helped to promote the Government's 'Be Plant Wise' and 'Check, Clean, Dry' campaigns in the New Forest area. The 'Be Plant Wise' campaign aims to raise awareness amongst gardeners and the horticultural trade about the problems caused by invasive non-native aquatic plants and the need for careful disposal of surplus plants in garden ponds. The 'Check, Clean, Dry' campaign aims to promote awareness about the importance of biosecurity to stop the spread of aquatic invasive non-native species.

Both campaigns (Figure 115) have been promoted through the use of banners and leaflets at training sessions and displays at awareness-raising events.

Figure 115: Logos used to promote Government campaigns.

The Project Officer has visited local garden centres (Figure 116 and Figure 117) to promote the 'Be Plant Wise' campaign by talking to staff, providing interpretative material and ensuring that the five particularly invasive non-native plants targeted by this campaign are not offered for sale.

Figure 116: Promoting the 'Be Plant Wise' campaign at local garden centres.

Figure 117: Promoting the 'Be Plant Wise' campaign at local garden centres.

7.3. Invasive Species Week

The NFNNPP has participated enthusiastically during Invasive Species Week, a national initiative promoted annually by the GB Non-Native Species Secretariat, which aims to raise awareness about invasive non-native species, the problems they cause and the actions people can take to stop their spread.

Invasive Species Week is an ideal opportunity for the Project Officers to visit local garden centres, talk to customers, owners, managers and staff, promote the Be Plant Wise campaign and raise awareness about invasive non-native species which have been banned from sale under the Wildlife and Countryside Act 1981 or the EU Invasive Alien Species Regulation (Figure 118).

Figure 118: Invasive Species Week is an ideal opportunity to raise awareness at local garden centres.

Other activities undertaken by the NFNNPP during Invasive Species Week have included

- issuing press releases to encourage people to volunteer with the NFNNPP;
- leading volunteer work parties to pull Himalayan balsam;
- hosting a meeting with other conservation organisations to co-ordinate the programme of Himalayan balsam pulls;
- hosting the New Forest Non-Native Plants Project annual Forum;
- giving a talk at Redcliffe Garden Centre;
- writing a blog on behalf of Wildlife and Countryside Link's Invasive Non-Native Species Group;
- attending a briefing event at the House of Lords arranged by Wildlife and Countryside Link's Invasive Non-Native Species Group during May 2019.

8. RINSE

8.1. Introduction to RINSE

The New Forest Non-Native Plants Project participated in RINSE (Reducing the Impact of Non-Native Species In Europe), a European project which aimed to improve the management of invasive non-native species across four partner countries in Western Europe, by sharing best practice and adopting strategic approaches to tackle the threats posed by invasive non-native species.

RINSE was part-funded by the European Union (European Regional Development Fund) delivered through the INTERREG IVA 2 Mers Seas Zeeën Programme which promotes cross-border co-operation between the coastal regions of four Member States, namely France (Nord-Pas de Calais), England (SW, SE), Belgium (Flanders) and The Netherlands (South coastal area).

The Trust was one of nine partner organisations from the UK, The Netherlands, France and Belgium which participated in RINSE, with Norfolk County Council as Lead Partner.

RINSE focussed on three 'work packages', namely

- targeting and prioritisation;
- training and awareness-raising;
- field trials and demonstration projects.

Through the NFNNPP, the Trust participated in all three 'work packages', including attendance at workshops (Figure 119). Activities commenced at the start of 2012 and continued until the end of September 2014.

Figure 119: John Durnell, Dr Naomi Ewald and Jo Gore during a RINSE workshop at Bournemouth University on 24th April 2012.

8.2. Targeting and Prioritisation

The Project Officer participated in a workshop held in Cambridge on 21st November 2012 focussing on the 'horizon scanning' research being undertaken by the University of Cambridge.

8.3. Training and Awareness-raising

The NFNNPP organised training and awareness-raising sessions aimed at a variety of target audiences (Figure 120):

- training for staff in Hampshire County Council Highways Department on 10th July 2012;
- training for Highways Agency consultants (Enterprise Mouchel) on 23rd July 2012;
- training for staff working for New Forest District Council on 7th November 2012;
- awareness-raising for fly fishermen and anglers on 12th February 2013;
- one-day conference focussing on the control of New Zealand pygmyweed on 20th March 2013;
- awareness-raising day for horticulturists held at Exbury Gardens on 11th September 2013;
- training for local planning authority countryside managers on 28th October 2013;
- one-day conference focussing on the role of volunteers and citizen science in the control of invasive non-native plants held on 19th March 2014.

Figure 120: Head Gardener John Anderson who hosted the RINSE awareness-raising session for horticulturists at Exbury Gardens on 11th September 2013.

On 13th March 2013 the Project Officer met staff at New Forest National Park Authority to explore opportunities to stop the spread of invasive non-native plants through the planning system and prepared a Guidance Note dated 31st March 2014 titled 'Helping to stop the spread of invasive non-native plants through the Planning System: a guidance note prepared for the New Forest National Park Authority by Hampshire and Isle of Wight Wildlife Trust'.

The Project Officer gave a presentation at the RINSE Closing Conference in Norwich on 23rd September 2014, focussing on these awareness-raising activities.

8.4. Field Trials and Demonstration Projects

8.4.1. Field Trials

The New Forest Non-Native Plants Project commissioned Dr Naomi Ewald of Freshwater Habitats Trust to prepare a report on the trials involving hot foam aquatic dye and herbicide to control New Zealand pygmyweed. The report dated April 2014 (Ewald, 2014b) is available on the RINSE website www.rinse-europe.eu/.

8.4.2. Demonstration Projects

Reports on three 'demonstration projects' were prepared by the Project Officer:

- Mobilising volunteers (Figure 121) to control Himalayan balsam across river catchments (Chatters, 2013b);
- Control of creeping water primrose *Ludwigia grandiflora* at Breamore Marsh, in New Forest District, Hampshire, UK (Chatters, 2013c);
- Control of giant hogweed *Heracleum mantegazzianum* along the Avon Water in The New Forest, Hampshire, UK: a case study in controlling an invasive non-native plant in a landscape characterised by fragmented land ownership (Chatters, 2013d).

These reports dated April 2013 are available on the RINSE website www.rinse-europe.eu/

Figure 121: The Project Officer's experience in leading volunteer work parties informed the RINSE demonstration project relating to the mobilisation of volunteers (Photograph: Ashley Basil).

9. VOLUNTEER INVOLVEMENT

9.1. Involvement of Volunteers in Research and Survey and Submission of Records

The involvement of volunteers in submitting records and undertaking research and surveys has already been referred to in section 2 and section 5.3 of this report.

9.2. Involvement of Volunteers in the Practical Control of Invasive Non-native Plants

Volunteers make a significant contribution to the success of the Project through their participation in work parties to control Himalayan balsam and other target species. Work parties to control Himalayan balsam have been led by the Project Officers each year since 2009 and have attracted a large number of volunteers, many of whom have participated regularly. A contractor has also led volunteer work parties along the Lymington River on behalf of the Project, focussing on areas where access is relatively difficult due to wet and muddy ground conditions.

Himalayan balsam-pulling has attracted a wide range of volunteers (Figure 122 & 123) including local residents, naturalists, the Women's Institute, youth organisations (Beavers, Cubs, Brownies, Scouts and Guides and Explorer Scouts), local schools and colleges, businesses (including Lloyds Bank, HSBC, KPMG, Waitrose, SSE, Lombards, BDO, Oil Spill Response, BT, Willmott Dixon, GE Aviation, The Phoenix Group, Arco and Southern Co-op Board members), the Maritime and Coastguard Agency, staff from Winchester University, staff from Solent Southampton University, staff from the Chartered Institute of Ecology and Environmental Management, Forestry Commission/Forestry England staff, the National Trust's volunteers and a group of service-users from 'Headway' which is a charity helping people who have head injuries. Environment Agency staff and staff from the New Forest National Park Authority have participated in balsam pulls as team-building activities.

Figure 122: Staff from Winchester University volunteered to pull Himalayan balsam on the Avon Water.


Figure 123: Himalayan balsam-pulling has attracted a wide range of volunteers, including many youngsters.

The Trust is very grateful to all the volunteers who have helped with the control of Himalayan balsam during work parties held on behalf of the NFNNPP. Information has been collated for the past eleven years to give an indication of the scale of this volunteer activity (Table 2). A total of 19,842.25 hours have been spent by volunteers pulling Himalayan balsam with the NFNNPP between 2009 and 2019.

Table 2: Himalayan balsam - volunteer activity 2009-2019.

Year	Number of individual volunteers participating in balsam-pulls organised on behalf of NFNNPP	Total number of hours spent by volunteers participating in balsam-pulls organised on behalf of NFNNPP
2009	9	45
2010	280	1,234.75
2011	215	1,069
2012	116	1,350
2013	175	2,155
2014	159	1,317
2015	236	2,124
2016	248	2,250.5
2017	337	3,288.25
2018	196	2,688.5
2019	161	2.322.5

The Project has performed a useful role in co-ordinating balsam-pulling with other organisations that organise volunteer work parties, such as Natural England, the National Trust and the Forestry Commission / Forestry England, by convening meetings to plan the summer work programmes.

Volunteers have helped control creeping water primrose by hand pulling and American skunk cabbage and pitcher plants by digging and manual removal (Figure 124) during work parties organised by the Project Officers.

Figure 124: Volunteers have helped with the removal of pitcher plants.

9.3. Involvement of Volunteers in Awareness-raising

Volunteers have performed a very important role at events such as the New Forest Show (Figure 125), engaging with the public and raising awareness about the problems caused by invasive non-native plants.

People have kindly volunteered at events organised by the NFNNPP, including conferences, training sessions and the annual Forum, and have played a very helpful role setting up the room, serving refreshments and welcoming delegates.

Film-makers Joe Constable and Sophie van der Meeren volunteered to make a film to raise awareness about the Project (Figure 126). This was finalised during autumn 2012, launched at the volunteer event at Brockenhurst Village Hall on 27th September 2012 and made available for viewing on the Project webpage of the Trust's website.

Figure 125: Volunteer Jim Whatley talking to a visitor at the New Forest Show.

Figure 126: Volunteer Joe Constable making a film about the Project.

10. ‘OUR PAST, OUR FUTURE’

10.1. Introduction to ‘Our Past, Our Future’

The New Forest ‘Our Past, Our Future’ Landscape Partnership Scheme, funded by the Heritage Lottery Fund / National Lottery Heritage Fund, aims to ensure that the New Forest’s distinctive landscape survives through future change and modern-day pressures. Led by the New Forest National Park Authority working with several delivery partners including the Trust, the Landscape Partnership is undertaking a range of projects to restore lost habitats, develop people’s skills and inspire a new generation to champion and care for the New Forest.

Since 2016 the NFNNPP has received the majority of its funding through the New Forest ‘Our Past, Our Future’ (OPOF) Landscape Partnership Scheme.

10.2. Awareness-raising and effecting behavioural change

Awareness-raising is an important element of the NFNNPP’s involvement with OPOF, with the aim of effecting behavioural change to reduce the occurrence of invasive non-native plants in the New Forest area.

With funding from OPOF the NFNNPP organised training and awareness-raising sessions aimed at a variety of target audiences (Figure 127):

- a session for horticulturists on 27th September 2016;
- a session for New Forest District Council staff on 1st November 2016;
- a session for anglers and fishermen on 9th March 2017;
- a session for National Trust volunteers on 31st October 2017;
- sessions for Parish Councils on 1st March 2018 and 31st October 2018;
- a session for Forestry Commission volunteers on 14th November 2018;
- a session for ecological consultants on 11th February 2019;
- a session for ‘Our Past, Our Future’ project officers on 13th March 2019;
- a session for Network Rail on 27th March 2019;
- a session for young commoners on 10th May 2019;
- a session for volunteers on 6th November 2019;
- a session for staff managing road verges is scheduled for 11th March 2020.

Figure 127: participants doing the identification quiz during the training session for anglers and fishermen held on 9th March 2017.

As part of the work undertaken with funding provided by OPOF, the Project Officers have arranged meetings with groups of landowners and land managers to encourage people to take responsibility for stopping the spread of invasive non-native plants. A meeting was held on 26th March 2018 in Burley for landowners along the Mill Lawn Brook, a meeting was held on 21st January 2019 for landowners along the Cadnam River and a meeting has been arranged for riparian owners along the Avon Water on 19th March 2020. Liaison has been particularly effective between the NFNNPP and members of Brokenhurst Manor Fly Fishing Club who manage significant sections of the Lymington River as the fishing club members have offered to ensure management is undertaken to control Himalayan balsam beyond the end of the OPOF Landscape Partnership scheme.

10.3. Control of invasive non-native plants by volunteers and contractors

With Lottery funding administered through OPOF the Project Officers have led volunteer work parties to hand pull Himalayan balsam in the vicinity of the Cadnam River, the Avon Water, the Fleet Water and the Lymington River and two of its tributaries, namely the Mill Lawn Brook and the Passford Water. These work parties have been held during the summer and early autumn of 2016, 2017, 2018 and 2019 (Figure 128).

Figure 128: Volunteers participating in a balsam pull along the Avon Water on 4th August 2016, organised through the 'Our Past, Our Future' Landscape Partnership.

Since 2016, Lottery funding has also paid for professional contractors to undertake herbicide treatment to control giant hogweed on over 30 properties along the Avon Water, American skunk cabbage in Harcourt Wood near Minstead and Japanese knotweed on 20 properties along the Cadnam River.

11. OTHER ACTIVITIES

11.1. Legislative Changes

11.1.1. Species Control Agreements and Species Control Orders

During autumn 2012 the Project Officer responded to the Law Commission's review of wildlife law (Law Commission Consultation Paper No 206) which included a review of legislation relating to invasive non-native species. The NFNNPP welcomed the provisional proposals for Species Control Agreements and Species Control Orders. The NFNNPP particularly welcomed Species Control Orders in situations where no landowner can be identified.

A Wildlife Law Interim Statement was published on 15th October 2013 which set out the Law Commission's conclusions in advance of it drafting legislation and which recommended the introduction of species control orders in England and Wales. During January 2014 the Project Officer responded to the House of Commons Environmental Audit Committee Inquiry on Invasive Species and asked the Committee to consider endorsing the Law Commission's recommendation for the introduction of Species Control Orders in England and Wales as these would be of particular benefit where the relevant body is unable to identify the owner or occupier.

Species Control Agreements and Species Control Orders were subsequently enshrined in the Infrastructure Act which received Royal Assent on 12th February 2015.

11.1.2. Species Control Provisions – draft Code of Practice

During December 2015 DEFRA commenced a consultation process on the draft Code of Practice relating to the Species Control Provisions enshrined in the Wildlife and Countryside Act 1981 as a result of changes brought in by the Infrastructure Act 2015. The Project Officer was alerted to the consultation process by Wildlife and Countryside Link's Invasive Non-Native Species Group and submitted comments via Wildlife and Countryside Link in December 2015.

11.1.3. Review of Schedule 9 of Wildlife and Countryside Act 1981

Through Wildlife and Countryside Link, the NFNNPP has participated in discussions regarding the need to amend Schedule 9 of the Wildlife and Countryside Act 1981 and has highlighted American skunk cabbage and pitcher plant as possible candidates for inclusion on Schedule 9.

11.1.4. Review of List of Species of Union Concern

Through Wildlife and Countryside Link, the NFNNPP provided evidence for inclusion of American skunk cabbage in the list of 'invasive alien species of Union concern' in accordance with Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (the 'Invasive Alien Species Regulation').

The wildflower charity Plantlife sought information from the NFNNPP about the impact of American skunk cabbage in connection with the review of the list of Species of Union Concern. The Project Officer provided the report by Neil Sanderson that was commissioned by the NFNNPP. In response, Dr Trevor Dines of Plantlife stated in an email to his colleague Andy Byfield 'This is outstanding. It's exactly what we need – Neil's report provides strong scientific evidence for the need for control and Catherine's figures give the economic impact. Please pass on my thanks to Catherine for supplying this and letting us use the information. Yes – we'll credit HIWWT for the information in the case study'.

The first list of species of Union concern came into force on 3rd August 2016 and included American skunk cabbage.

11.2. Review of the Great Britain Invasive Non-Native Species Framework Strategy

In June 2014 the Project Officer submitted comments to DEFRA on the draft recommendations relating to the quinquennial review of the GB Invasive Non-Native Species Framework Strategy. The review resulted in the publication of The Great Britain Invasive Non-native Species Strategy in August 2015 (DEFRA, 2015) which includes photographs taken by the Project Officer of children during a Himalayan balsam pull and contractors spraying parrot's feather.

11.3. Management Measures for Widely Spread Invasive Alien Species

The EU Invasive Alien Species Regulation came into force in 2015 and for widely spread Species of Union Concern the Regulation requires effective management measures to be put in place so that their impact on biodiversity, the related ecosystem services and, where applicable, on human health or the economy are minimised. During July 2019 DEFRA initiated a consultation on management measures for widely spread invasive alien Species of Union Concern in England and Wales. The NFNNPP responded to the consultation on 22nd July 2019.

11.4. Community Protection Notice

For many years the Project Officer had unsuccessfully attempted to ascertain the ownership of a parcel of land adjacent to the Cadnam River, despite extensive investigation. This piece of land had been invaded by Himalayan balsam and Japanese knotweed which threatened to spread, thereby jeopardising the work undertaken by volunteers and contractors to control these species further downstream.

The Project Officer had hoped that a Species Control Order, in accordance with The Infrastructure Act, 2015, could be used to gain access but was advised by DEFRA that a Community Protection Notice would be more appropriate. Community Protection Notices are issued in accordance with the Anti-social Behaviour, Crime and Policing Act, 2014 by the police or the local authority and can be used against individuals or bodies that are acting unreasonably and who persistently or continually act in a way that has a detrimental effect on the quality of life of those in the locality.

Although the Anti-social Behaviour, Crime and Policing Act, 2014 does not explicitly refer to invasive non-native plants, the Home Office issued guidance stating that Community Protection Notices can be used to require someone to control or prevent the growth of Japanese knotweed or other plants that are capable of causing serious damage to communities.

DEFRA drew the Project Officer's attention to the fact that Community Protection Notices can be used in situations where the ownership of land can not be ascertained.

The Project Officer liaised with a local police officer who had a specific remit for rural matters. He noted that the Project Officer had done a thorough search to try to ascertain ownership and he agreed that the use of a Community Protection Notice would be appropriate in this case.

On 25th February 2016 a Community Protection Notice was served on the 'Owner/Occupier or person in charge of Parcel of Land as detailed on attached map'. The Notice related to 'the management of invasive non-native plants' and required contact to be made with Hampshire Constabulary by 15 May 2016 quoting incident number 44160077841.

One copy of the notice and accompanying map was displayed by the footpath at the south-western end of the site; another copy of the notice and accompanying map was displayed by the footpath at the north-eastern end of the site (Figure 129).

As no-one made contact with the Police by 15th May 2016, the NFNNPP was given authorisation to commission contractors to control the Japanese knotweed and to lead volunteers to pull the Himalayan balsam. Work to control invasive non-native plants at this site commenced in 2016.

During November 2016 Craig Lee (Senior Policy Adviser, Invasive Non-Native Species Team) of DEFRA emailed the Project Officer to say 'I am giving a talk next Friday at the UK Wildlife Enforcers conference…I'd like to make reference to your CPN, not only because it was the first and only one so far made, but also because it was made by the Police'.

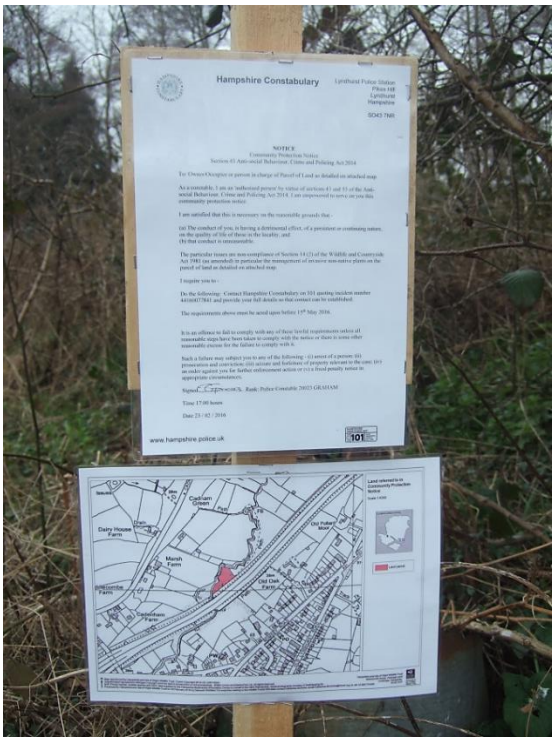

Figure 129: Community Protection Notice and accompanying map displayed on land adjacent to the Cadnam River on 25th February 2019.

11.5. Proposals for Biological Control

During 2009 the Project Officer responded to the DEFRA consultation relating to the proposed release of *Aphalara itadori* (a psyllid) to test its suitability for biological control of Japanese knotweed. The Project Officer was asked by CABI to collect New Zealand pygmyweed in connection with the research being undertaken to find a biological control agent for this species; the Project Officer collected specimens and sent them to CABI on 3rd March 2010. During 2014 the Project Officer responded to the DEFRA consultation relating to the proposed release of the rust fungus *Puccinia komarovii* var *glanduliferae* to test its suitability for biological control of Himalayan balsam.

During April 2016 the Project Officers met representatives of CABI to discuss the potential use of Lymington Reedbeds Nature Reserve as a trial site to test the efficacy of the rust fungus. Following the meeting the Trust concluded that for a number of reasons the nature reserve would not be a suitable location for the trials.

During 2018 the Project Officer responded to the DEFRA consultation relating to the proposed release of an eriophyoid mite *Aculus* sp to test its suitability for biological control of New Zealand pygmyweed.

11.6. Tackling Dumping of Garden Waste

The NFNNPP has liaised with the Forestry Commission to raise awareness about the problems caused by the dumping of surplus garden pond plants and general garden waste, through publicity in local papers and parish council magazines, delivering advisory letters to local residents and undertaking practical clearance of garden waste on 23 March 2011. The Project Officer convened a meeting on 6th May 2011 with representatives of Natural England, The Verderers, Forestry Commission and New Forest National Park Authority to discuss how to tackle the problem of garden waste being dumped in the New Forest countryside.

The NFNNPP liaised with the Forestry Commission to clear dumped garden waste from an area of Crown Land on 23rd March 2011.

11.7. Revised Guidance Relating to Control of Aquatic and Riparian Plants

On 8th May 2013 the Project Officer gave a presentation at a meeting hosted by the Environment Agency (attended by representatives of JBA Consulting, Natural England *et al*) in Church House, Westminster to discuss preparation of revised guidance relating to the control of aquatic and riparian plants.

11.8. Visit by Lord Gardiner

On 21st August 2017, at the suggestion of Craig Lee (DEFRA), Lord Gardiner, Parliamentary Under-Secretary of State for Rural Affairs and Biosecurity, participated in a Himalayan balsam work party as an opportunity to meet volunteers and find out about the NFNNPP as an example of a Local Action Group (Figure 130 and Figure 131).

After the balsam pull Lord Gardiner wrote to the Project Officer to say "What a rewarding day yesterday in your company as you led a team of enthusiastic volunteers. It is cheering to see at first hand what can be achieved in a day. You and your volunteers are making such a positive contribution to the well being of the New Forest. It may seem daunting at times but you have the evidence to show what you have all done….May I wish you all continuing success".

Figure 130: Lord Gardiner (right) pulling Himalayan balsam with David Jordan, Chairman of HIWWT on 21st August 2017.

Figure 131: Lord Gardiner meeting NFNNPP volunteers on 21st August 2017.

11.9. Liaison with Hampshire County Council Highways

The NFNNPP has liaised with Hampshire County Council Highways staff to ensure that invasive non-native plants are controlled on road verges in the New Forest. HCC Highways agreed that the NFNNPP could take action to tackle Himalayan balsam growing in relevant road verges on condition that safety instructions were followed. Since then, volunteers have helped the Project Officers pull Himalayan balsam along road verges in the vicinity of the Cadnam River and the Avon Water (Figure 132).

Figure 132: Local residents who volunteered to help the Project Officer to pull Himalayan balsam along road verges on 1st June 2015.

The NFNNPP has also liaised with HCC Highways regarding the need to control giant hogweed and Japanese knotweed growing in road verges. The NFNNPP has also highlighted the need for effective co-ordination between the contractors working on behalf of HCC Highways who undertake herbicide treatment and those contractors who cut the road verge vegetation.

11.10. Liaison with Highways Agency / Highways England

The NFNNPP has liaised with Highways Agency / Highways England and their agents including Enterprise Mouchel and Kier Services regarding the management of Himalayan balsam, Japanese knotweed and giant hogweed growing in road verges along major roads such as the M27 and A31. A meeting held on 4th May 2016 with Kier Services was followed by a site visit on 13th July 2016 (Figure 133) and an awareness-raising session is planned for March 2020.

Figure 133: Ian Legg, Landscape Delivery Manager of Kier Services (left) and Catherine Chatters (right) surveying Himalayan balsam on the embankments of the M27 motorway on 13th July 2016.

11.11. Liaison with Network Rail

Recognising the need for more effective control of Himalayan balsam on Network Rail's property adjacent to railway lines in the vicinity of the Lymington River and its tributary the Passford Water, the NFNNPP hosted site visits with Network Rail representatives and invited a member of Network Rail staff to speak at the Project's annual Forum meeting. Since then a very productive meeting was hosted by Natural England during November 2018 to enable Sam Rooney (Section Manager Off Track, Wessex Outer Delivery Unit) of Network Rail to meet the Project Officers and discuss ways to control Himalayan balsam effectively. At this meeting it was agreed that a) training and information packs would be provided by NFNNPP, b) the Project Officer would walk the route of the railway lines with Network Rail to ascertain where Himalayan balsam would need to be controlled and c) Network Rail would supervise the Project Officer to hand-pull balsam on the railway embankments during Summer 2019.

A training session was delivered by the Project Officers at Network Rail's depot in Eastleigh on 27th March 2019 and information packs were provided. The event was attended by 14 people including administrative and planning staff from Network Rail, lineside inspectors and contractors. After this event Catherine Chatters sent Sam Rooney a report of the training and he emailed on 29th March 2019 to say "Thank you very much for preparing this report in a timely manner …very informative and useful session all round I thought. I have already shared this with our upper management and they are very impressed with our engagement and future workings together that are already diarised. We look forward to continuing this way forward and if you have any other colleagues within the New Forest or further afield you think would benefit from a meeting then please pass over their details".

During Invasive Species Week Jo Gore met five Network Rail employees on 13th May 2019 to identify and pull the balsam along the railway embankments at Brockenhurst in the vicinity of the Lymington River SSSI. On 18th June 2019 Jo led a session along the branch line in the vicinity of the Passford Water (Figure 134) and further sessions were held on 18th July and 17th September 2019.

Figure 134: Network Rail staff pulling Himalayan balsam in co-operation with NFNNPP on 18th June 2019 (Photograph: Jo Gore).

11.12. International Liaison

As mentioned in section 8 of this report, the NFNNPP was a partner in the European-funded RINSE project which facilitated liaison between partner organisations in The Netherlands, France, Flanders and England. The NFNNPP benefited from Dr Johan van Valkenburg's experience and knowledge of methods to control of creeping water primrose, as stated in section 5.4 of this report.

During July 2016 Professor Kamigawara of the University of Shinga Prefecture in Japan contacted the Project Officers. He was interested in the social aspects of invasive non-native plant management and was making a comparative study of the social response to the control of creeping water primrose in Japan, France and the UK. He had read reports by both Project Officers and hoped to gain an insight into the work undertaken at Breamore Marsh to control this species. On 8th September 2016 the Project Officers met Professor Kamigawara and his colleague Mr Shinya Hieda, a PhD student, to discuss control of creeping water primrose (Figure 135). During September 2018 Jo hosted a visit to Breamore Marsh with Professor Kamigawara and his PhD student (Figure 136).

Figure 135: Jo Gore with Professor Kamigawara and colleague of the University of Shiga Prefecture in Japan discussing control of creeping water primrose on 8th September 2016.

Figure 136: Professor Kamigawara and his PhD student at Breamore Marsh on 13th September 2018 (Photograph: Jo Gore).

On 16th July 2019 The Project Officers received an e-mail message from Takayuki Odagami, Advisor at the Water Quality Division of the Environmental and Community Affairs Department of Chiba Prefecture in Japan. He said:-

"I am contacting you following the introduction of Prof. Kamikawara (sic) of Shiga Prefectural University. Upon reading your dissertation, I felt that you have a profound understanding of the elimination and management of the alien aquatic plant *Ludwigia grandiflora*, as well as the legal systems surrounding it…..We would like to visit you and learn about your country's controls, legal systems, and management regarding this topic and we would like to hear your explanations about measures and control methods at the control site at a convenient date between September 3-7 or another nearby date. I would be honoured if I could make an appointment".

On 6th September 2019 Jo and Catherine met Takayuki Odagami and four of his colleagues, namely Kenichi Fitakami (Nature Conservation Division, Chiba Prefecture), Taishi Shimomura (Chiba Prefecture Public Enterprises Bureau, Industrial Water Department, Chiba Industrial Water Office) and Shun Kataoka (River Environment Division, Land Development Department, Chiba Prefectural Government), with an interpreter at Breamore Marsh.

Jo outlined the discovery of Creeping Water Primrose at Breamore Marsh in 2009 and described the work undertaken (herbicide treatment, hand-pulling and excavation) to control it and the subsequent monitoring (Figure 137).

Figure 137: Jo Gore talking about the control of Creeping Water Primrose at Breamore Marsh on 6th September 2019.

11.13. Liaison with Other Projects and Organisations

The NFNNPP has provided advice and encouragement to other organisations seeking to tackle the spread of invasive non-native species. Examples include:

- 19th May 2010 – sharing knowledge and experience with Wiltshire Wildlife Trust to help develop the Wiltshire Invasive Plant Project;
- 12th & 13th April 2011 – hosting a visit by Dr Joe Caffrey and his colleagues involved in the EU LIFE-funded CAISIE project (Control of Aquatic Invasive Species and the Restoration of Natural Communities in Ireland);
- July 2011 – advice to Sussex Wildlife Trust hoping to tackle invasive non-native plants in the Arun and Rother catchments;
- 2011 & 2012 – advice to Eastleigh Borough Council establishing a project to tackle Himalayan balsam on the Monk's Brook;
- 23rd February 2012 – presentation at event organised by the Dedham Vale and Stour Valley Project, Suffolk;
- 27th April 2012 – hosted visit to the New Forest by the newly-appointed London Invasive Species Initiative Manager;
- 30th May 2012 – presentation in Norwich, at the Norfolk Non-native Species Initiative Stakeholders' Forum;
- 11th March 2013 – presentation and display at event hosted by the New Forest Land Advice Service to encourage local residents to control Himalayan balsam on the River Blackwater;
- 24th April 2013 – presentation at the Rolle Estate Office in Devon to encourage volunteers who have been pulling Himalayan balsam on the Clinton Devon Estate;
- 6th June 2014 – advice to Hythe and Dibden Parish Council regarding control of Japanese knotweed;
- 2nd July 2014 – advice to Hampshire County Council's Countryside Service regarding control of New Zealand pygmyweed;
- 19th February 2016 – advice to the Environment Agency in Lincolnshire regarding the costs involved in pulling Himalayan balsam as the EA were keen to set up a balsam control project through The Rivers Trust on the River Witham and its tributary The Cringle Brook;
- 11th March 2016 – advice to Maxfield Nature Conservation trust in East Sussex regarding control of parrot's feather;
- 6th April 2016 – advice to Dartmoor National Park via the Environment Agency in Devon on control of American skunk cabbage;
- 7th September 2016 – advice to Medway Valley Countryside Partnership on control of American skunk cabbage;
- 9th December 2016 – advice to a consultant regarding control of Cotoneaster at Newborough Warren, Anglesey;
- 11th January 2017 – advice to Fawley Parish Council regarding control of floating pennywort at Holbury Manor Ponds;
- 21st July 2017 – advice to Winterbourne Houghton Parish Council in North Dorset regarding control of Himalayan balsam and relevant legislation;
- 16th October 2017 – advice to Natural England regarding control of American skunk cabbage which had been discovered on the Exe Estuary;
- 16th April 2018 – advice to Hampshire County Council Countryside Service regarding control of American skunk cabbage in Warsash;
- 22nd June 2018 – advice to The Wandle Trust on use of Community Protection Notices;
- 19th July 2018 – advice to Ringwood Town Council regarding control of Himalayan balsam;
- 19th July 2018 – advice to Scottish Natural Heritage regarding control of pitcher plants;
- 30th August 2018 – advice to Cornwall College, Newquay on Cotoneaster identification guides;
- 27th September 2018 – advice to Portsmouth and District Angling Society regarding suspected infestation of floating pennywort;
- 11th December 2018 – advice to Yorkshire Wildlife trust regarding control of American skunk cabbage;
- 18th February 2019 – advice to Wessex Chalk Streams and Rivers Trust regarding legislation;
- 12th April 2019 – advice to HWWT Watercress and Winterbournes Project regarding the control of invasive non-native plants;
- 4th March 2019 – provision of photograph for Brecon Beacons National Park Authority;

- 14th June 2019 – advice to Yorkshire Wildlife Trust regarding control of American skunk cabbage;
- 12th September 2019 – sharing knowledge with Jeremy Burgess, Landscape and Biodiversity Lead (Water) of the South Downs National Park Authority to help develop an invasive non-native species project in the South Downs.

11.14. Responses to Queries relating to Parliamentary Questions

On 23rd October 2017 Olaf Booy (GB Non-Native Species Secretariat) and Craig Lee (Senior Policy Adviser in DEFRA's Invasive Non-native Species Team) sought information from Catherine Chatters in relation to a Parliamentary Question from Baroness Sharples concerning control of Japanese knotweed. Craig was compiling an answer to be given by Lord Gardiner of Kimble and wanted to know what Local Action Groups were doing to control this species. Catherine provided information relating to the NFNNPP.

On 31st October 2017 Catherine Chatters provided information to Dr Niall Moore (GB Non-Native Species Secretariat) about the NFNNPP's work to control pitcher plants and American skunk cabbage in response to a Parliamentary Question. The information provided by NFNNPP was incorporated into the brief for Lord Gardiner's response.

On 9th November 2017 Craig Lee (Senior Policy Adviser in DEFRA's Invasive Non-native Species Team) sought information from Catherine in relation to a Parliamentary Question about the control of Himalayan balsam. Catherine provided facts and figures relating to the Himalayan balsam pulls led by the NFNNPP during 2017.

11.15. Contributions to Publications

The NFNNPP has contributed to a number of publications, by providing information and photographs and meeting authors.

11.15.1. Slow New Forest

Whilst undertaking research for her book titled 'Slow New Forest' which was published in April 2013, Emily Laurence-Baker spent a morning with Catherine Chatters during a Himalayan balsam pull along the Passford Water (Laurence Baker, 2013). This resulted in the section on 'Alien Invaders' in which Emily states:

'I joined Catherine and her loyal band of volunteers for a day's session of balsam pulling in a damp woodland beside the Passford Water, a tributary of the Lymington River….On that day, there were seven of us, all regulars except for me. The group, some of whom also volunteer for the Forestry Commission's Two Trees conservation team, were experienced and clearly devoted to Catherine and her mission to eliminate non-native species from the New Forest….She never came up for air, nor for that matter, did any of her volunteers. Just eyes down, backs bent and pulling from the roots. Sometimes everyone went quiet and there were only the gentle chirps of birds in the woods and a satisfying squelching as the mud relinquished the balsam roots…….Catherine's cheerful nature must be part of the reason the project has been so productive. She is so knowledgeable and dedicated that I felt motivated to pull as many of these invaders as I could….despite aches and a stinging nettle rash, I was pleased I'd done my very little bit towards protecting the Forest.'

11.15.2. Carnivorous Plants of Britain and Ireland

Tim Bailey, co-author of 'Carnivorous Plants of Britain and Ireland' (Bailey & McPherson, 2016), sought information from Catherine Chatters regarding the control of pitcher plants at Holmsley Bog. The work of the NFNNPP is referred to on page 156 as follows:

To protect threatened bog vegetation at Holmsley Bog, a removal programme began in February 2010. The process continued in October 2012 and again in January 2013. The efforts involved the removal of clumps of Sarracenia purpurea of approximately 120cm x 120cm. Further clearance efforts focused on seedlings, young plants and the remaining rootstock fragments of the large clumps (Catherine Chatters, personal communication).

The report by Neil Sanderson (Sanderson, 2012) commissioned by the NFNNPP is cited in 'Carnivorous Plants of Britain and Ireland':

In a study of the Holmsley Bog population, Sanderson (2012) observed how Sarracenia purpurea grew best on the top of hummocks and displaced the native hummock vegetation, including the specialist epiphytic liverwort flora, including Cladopodiella fluitans, Kurzia paucifolia, Odontoschisma sphagni and the nationally scarce Cephalozia macrostachya.

11.15.3. Field Guide to Invasive Plants & Animals in Britain

The book titled 'Field Guide to Invasive Plants & Animals in Britain' (Booy, Wade & Roy, 2015) includes two photographs taken by Catherine Chatters:

- page 9 – photograph of volunteer Alexander Bridges standing amongst American skunk cabbage plants in Lymington Reedbeds SSSI on 20th April 2011;
- page 76 – photograph of pitcher plants held by volunteer during work party at Holmsley Bog on 4th November 2013 (photograph incorrectly credited in acknowledgements on page 303).

11.15.4. Invasive Aliens: The Plants and Animals From Over There That Are Over Here

On 13th June 2017 during preparation for his book titled 'Invasive Aliens: The Plants and Animals From Over There That Are Over Here' (Eatherley, 2019) Dan Eatherley, naturalist, writer and environmental consultant, spoke to Catherine Chatters whose help is mentioned in the acknowledgements on page 293.

11.15.5. Practical Management of Invasive Non-Native Weeds in Britain and Ireland

During preparation of the Property Care Association's book titled 'Practical Management of Invasive Non-Native Weeds in Britain and Ireland' (Fennell, Jones & Wade, 2018) Catherine Chatters was contacted by Max Wade and provided information relating to control of American skunk cabbage and Cotoneaster. Work by the NFNNPP is included in the references on pages 3 and 18 and Catherine is acknowledged in the list of contributors.

12. RECOGNITION FOR THE PROJECT

12.1. Environment Agency Environmental Pioneer Awards 2010

The Environmental Pioneer Awards were launched by the Environment Agency in 2010. During 2010 the NFNNPP was one of three projects shortlisted for the Environment Agency staff award for environmental achievement. This is an award to recognise the outstanding achievements of an organisation or individual on environmental issues. Projects are selected by Environment Agency staff who nominate and vote for those that consistently lead the way in their ambition and performance on environmental issues.

The awards ceremony was held in London at Central Hal in Westminster on 24th November 2010. The booklet listing the shortlisted candidates described the NFNNPP as follows:

The New Forest Non-Native Plants Project is a jointly-funded partnership between the Environment Agency, Defra, Hampshire and Isle of Wight Wildlife Trust, Natural England, Forestry Commission and the New Forest National Park Authority.

This three-year project was launched in 2009 to stop the spread of non-native invasive plants in the New Forest area particularly along watercourses and in wetland habitats, many of which are of international ecological importance.

Partnership working is the key to the success of the Project. The Project has forged strong links with landowners who are encouraged to work together to tackle the problems at the catchment level. It has encouraged local volunteers of all ages to get involved in a practical way by pulling up Himalayan balsam. Others have volunteered by undertaking surveys and monitoring to assess the effectiveness of control work. The Project is successfully raising awareness and understanding about non-native invasive plants.

12.2. CPRE Hampshire Countryside Awards 2019

During 2019 the NFNNPP was selected as a finalist in the Community and Voluntary category of the Campaign for the Protection of Rural England's Hampshire Countryside Awards. The awards ceremony was held on 17th September 2019 when the Project Officers and two volunteers received a certificate on behalf of the Project from Nigel Atkinson, the Lord Lieutenant for Hampshire (Figure 138).

Figure 138: Nigel Atkinson, Lord Lieutenant for Hampshire, with representatives of the NFNNPP at the CPRE Hampshire Countryside Awards ceremony (Photograph: Jason Allen Photography.

12.3. Buckingham Palace Garden Party

Craig Lee of DEFRA kindly nominated Project Officer Catherine Chatters to attend a garden party at Buckingham Palace. The nomination was successful and Catherine asked Project Officer Jo Gore to be her guest at the garden party which was held on 31st May 2018 (Figure 139 and Figure 140).

Figure 139: The Project Officers during the garden party at Buckingham Palace on 31st May 2018.

Figure 140: Invitation to garden party at Buckingham Palace.

13. THE FUTURE

13.1. Financial Year 2020/21

Following the success of the NFNNPP (Figure 141) the Project will continue during the 2020/21 financial year at a reduced capacity. A programme of Himalayan balsam volunteer work parties has been planned for the summer months and volunteers will also help with the control of pitcher plants during the winter. Funding has been secured to continue the work undertaken by contractors to control many of the other target species listed in section 4.1 of this report. Although both Project Officers will continue to be employed until the end of September 2020, funding is currently only available to employ one Project Officer on a part-time basis (one day per week) during the remainder of the 2020/21 financial year.

13.2. Beyond 2020/21

The funding provided for the NFNNPP by the National Lottery Heritage Fund through the New Forest 'Our Past, Our Future' Landscape Partnership scheme is due to expire at the end of September 2020. The Lottery funding has been focussed on parts of the National Park which lie outside the Crown Land.

Funding for work to control invasive non-native plants on the Crown Land has been provided by the New Forest Higher Level Stewardship Scheme (for work on the Open Forest) and by the Forestry Commission / Forestry England through an agreement with Hampshire & Isle of Wight Wildlife Trust (for work outside the Open Forest).

The funding provided by the New Forest Higher Level Stewardship Scheme will expire at the end of February 2021 and the current agreement with Forestry England runs until 31st March 2021.

The NFNNPP is hopeful that funding will continue to be provided by Forestry England, for work relating to Crown Land beyond the Open Forest, following a review and renewal of its agreement with the Trust.

Although it is hoped that the New Forest Higher Level Stewardship Scheme may be 'rolled on' for another year, there is currently no certainty about future sources of funding for the Crown Land on the Open Forest.

Figure 141: Successful clearance of Himalayan balsam along the Lymington River downstream of Boldre Bridge
(Photograph: David Aylieff-Sansom, Middle of the Road Photography).

The Trust is intending to apply to the Environment Agency for funding to continue the NFNNPP as a Local Action Group beyond 2020/21 and is currently investigating other potential sources of funding.

The important role of Local Action Groups (LAGs) such as the New Forest Non-Native Plants Project is recognised by government.

As stated in the introductory section of this report, The Great Britain Invasive Non-native Species Strategy recognises that LAGs are critical to the successful control and eradication of invasive non-native species. The Strategy acknowledges that LAGs have 'controlled common species.....put in place prevention and early detection mechanisms, instigated training and supported awareness raising including promoting the 'Be Plant Wise' and 'Check, Clean, Dry' campaigns. Some have even carried out research and others have joined forces with groups from overseas to secure EU funding'.

During July 2019 the House of Commons Environmental Audit Committee's Invasive Species Inquiry considered the role of LAGs. Lord Gardiner of Kimble (Parliamentary Under-Secretary of State for Rural Affairs and Biosecurity) and Dr Niall Moore (Chief Non-Native Species Officer, DEFRA) gave evidence at the inquiry and both specifically referred to the New Forest Non-Native Plants Project.

During his answers to questions put by Caroline Lucas MP about the role of LAGs and the need for funding, Lord Gardiner referred to his visit to the New Forest to pull Himalayan balsam with the Project Officer and the volunteers. Lord Gardiner said he is 'very 'supportive' of the contribution made by LAGs as they are 'very successful and very committed' and he considered that 'ideally we should have more of them'. Mary Creagh MP (Chairman of the EAC Invasive Species Inquiry) commented on funding for LAGs, saying 'the reality is they don't go on fresh air. They need cash'.

The Environmental Audit Committee's report which was published on 25th October 2019 (House of Commons, 2019) refers to LAGs as follows:

> 'Local action groups (LAGs) were established by DEFRA under the 2009 GB INNS Strategy. Some groups cover a county or region, whilst other are focussed on a single river catchment. BES said that funding for LAGs was "inadequate" and suggested that they need to be expanded to ensure an even spread, with guaranteed long-term funding……..
> Lord Gardiner explained that DEFRA funded the establishment of the LAGs between 2011 and 2015, spending £1.5m to get them up and running. Of the 29 LAGs set up, just 18 are still active. Dr Moore said the New Forest has one of the most active ones.'

The Environmental Audit Committee's report welcomed 'the valuable contribution made by volunteers in Local Action Groups', recommended that 'the Government should take a more strategic, coordinated and resourced approach', regretted that 'one third of the Local Action Groups established by DEFRA no longer exist' and recommended that 'The Government should fund Local Action Groups on a long term (five yearly basis) and coordinate them through the Non Native Species Secretariat. It should also undertake a review of Local Action Groups to identify where best practice can be replicated and rolled out across the country.'

This report relating to the activities of the New Forest Non-Native Plants Project between 2009 and 2019 has demonstrated the important role of the Project as a Local Action Group in responding rapidly to new outbreaks of invasive non-native plants, co-ordinating control of invasive non-native plants at a catchment scale, mobilising volunteers, raising awareness about invasive non-native plants and the problems they cause, commissioning and undertaking research, influencing policy and legislation and implementing The Great Britain Invasive Non-native Species Strategy at a local level through effective partnership working.

Further work is required to complete co-ordinated catchment-scale control programmes of invasive non-native plants in the New Forest and to monitor sites to ensure eradication has been achieved.

It is therefore crucial that funding is secured to ensure the continuation of the New Forest Non-Native Plants Project.

14. ACKNOWLEDGEMENTS

Hampshire and Isle of Wight Wildlife Trust is very grateful for financial support from the following organisations since the start of the New Forest Non-Native Plants Project in 2009

The New Forest Non-Native Plants Project wishes to acknowledge the co-operation from the many landowners and land managers and the support that they have given to the Project Officers.

Thanks to the Steering Group members who have given their support and offered advice.

The New Forest Non-Native Plants Officers acknowledge the help given by so many volunteers who have worked enthusiastically to eradicate invasive non-native plants from the New Forest area and who have undertaken surveys on behalf of The New Forest Non-Native Plants Project.

Grateful thanks to those people who have agreed to their photographs being reproduced in this report. The name of the relevant photographer or the source of the photograph is acknowledged beneath each picture. All other photographs have been taken by Catherine Chatters (New Forest Non-Native Plants Officer).

Thanks to Jo Gore (Hampshire and Isle of Wight Wildlife Trust) for proof-reading this report and thanks to Catherine McGuire, Sarah Jackson and Ruth Kernohan (Hampshire & Isle of Wight Wildlife Trust) for preparing the maps used in this report.

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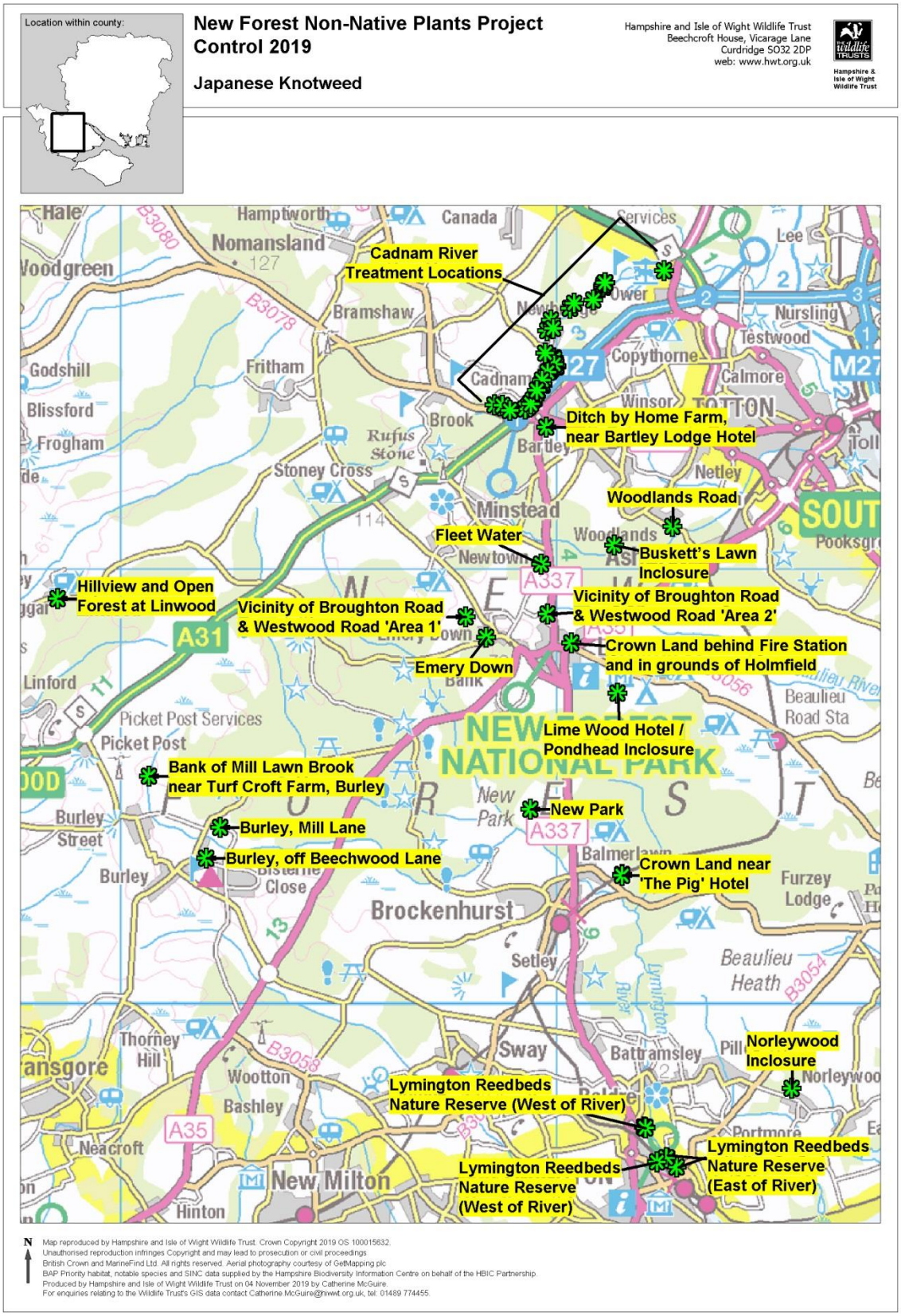
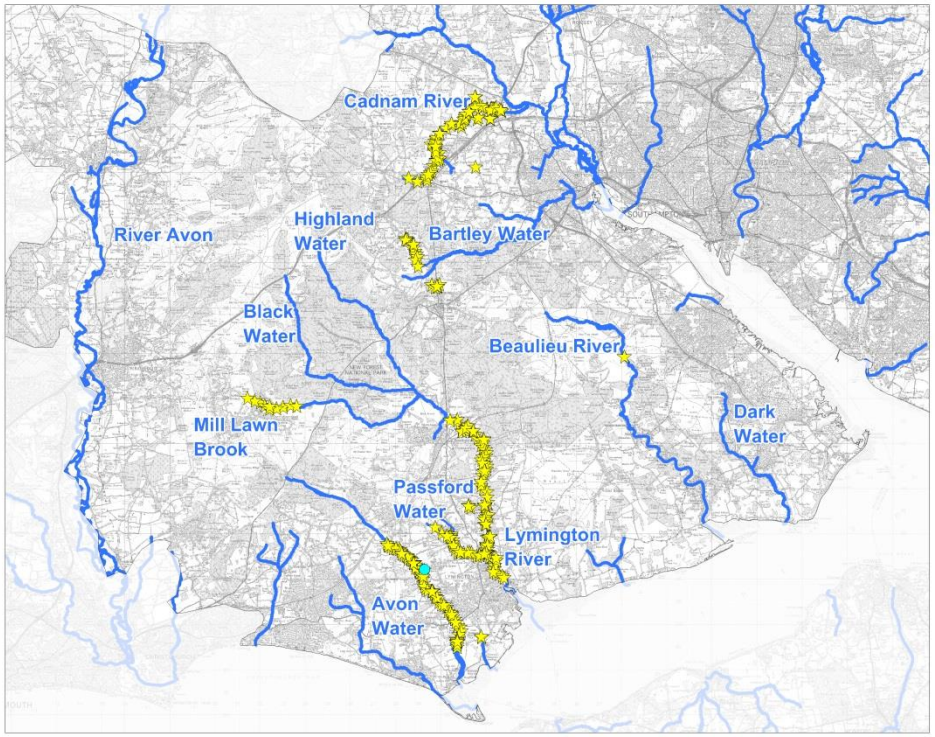
APPENDICES

Appendix 1:

Maps showing location of control work undertaken during 2019 on behalf of the New Forest Non-Native Plants Project

Appendix 1: Maps showing location of control work undertaken during 2019 on behalf of the New Forest Non-Native Plants Project.





New Forest Non-Native Plants Project:

Himalayan Balsam Control 2019

☆ Balsam Pulling Location

○ None found here in 2019

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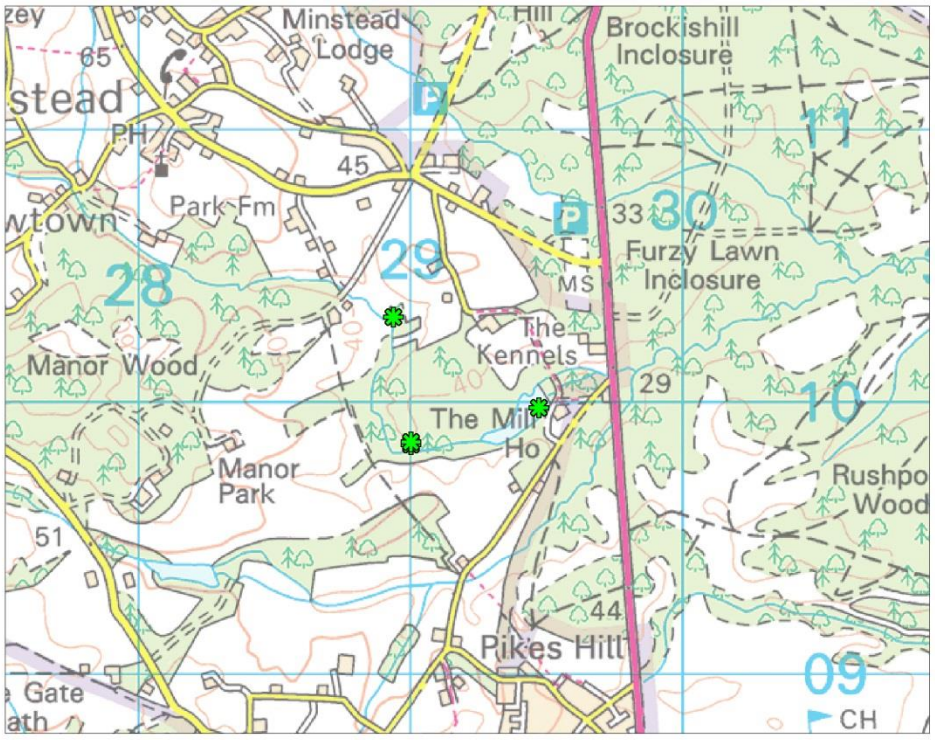
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

Hampshire & Isle of Wight Wildlife Trust



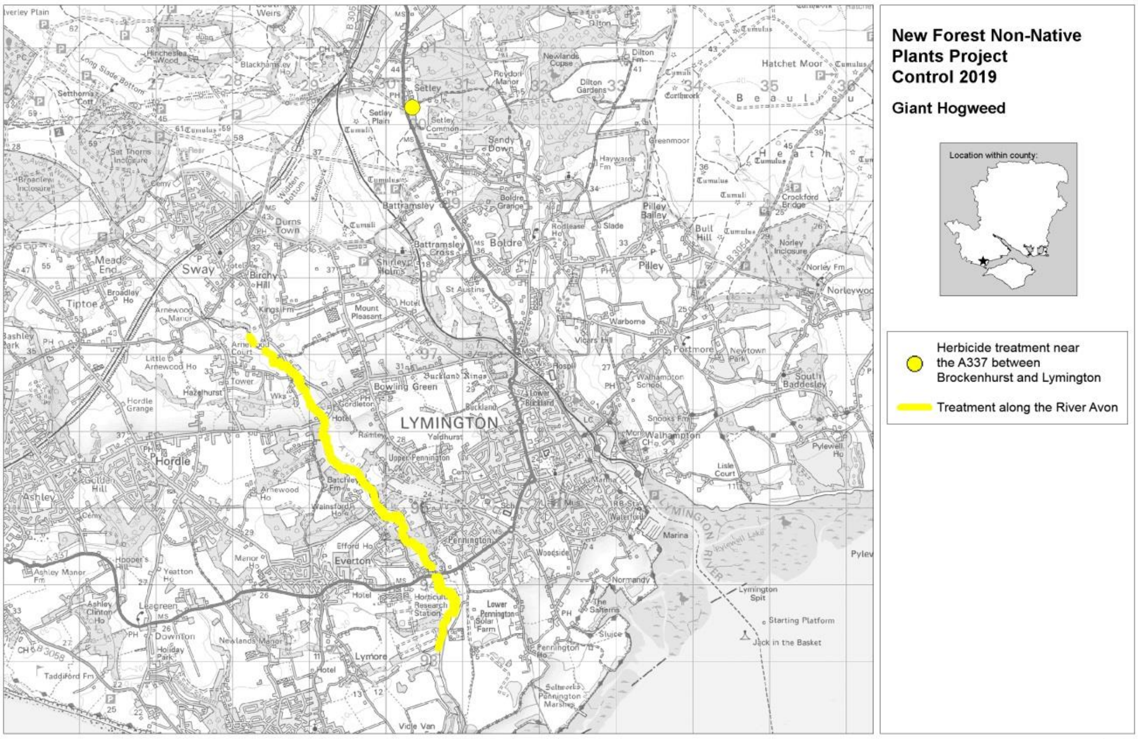
New Forest Non-Native Plants Project Control 2019

Orange Balsam
Impatiens capensis

Removed by Project Officer in 2019

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

Hampshire & Isle of Wight Wildlife Trust



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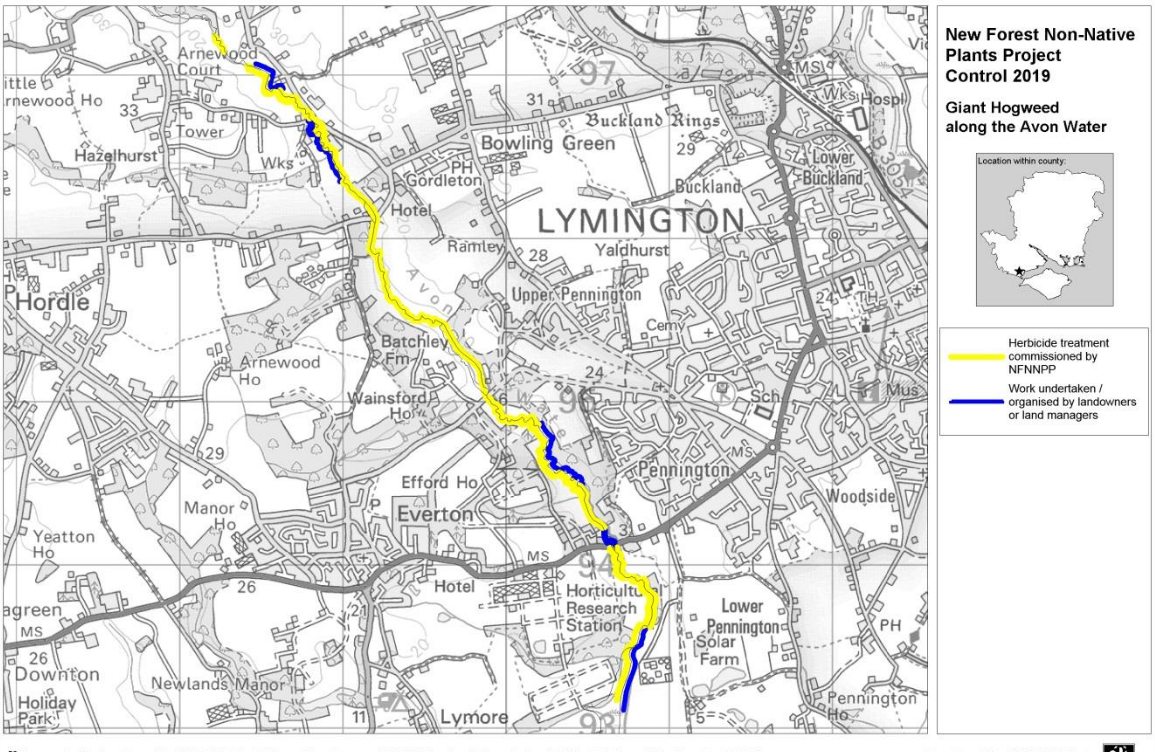
Produced by Hampshire and Isle of Wight Wildlife Trust on 04 November 2019 by Catherine McGuire. For enquiries relating to the Wildlife Trust's GIS data contact Catherine McGuire, email Catherine.McGuire@hiwwt.org.uk, tel: 01489 774455.

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP



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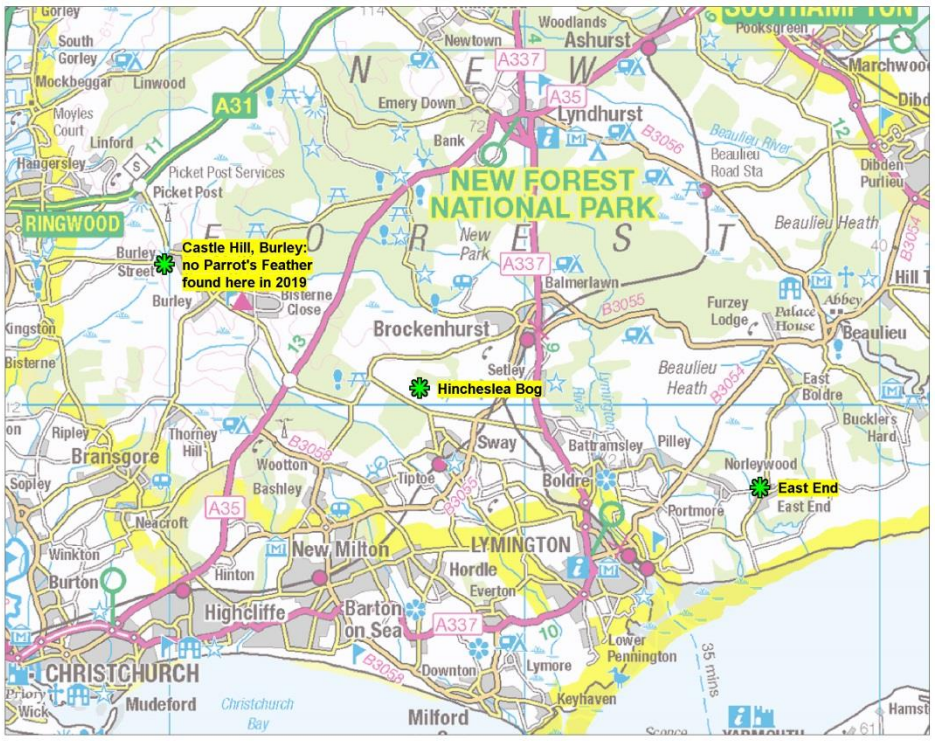
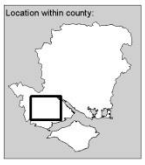
Curdridge, Hampshire
SO32 2DP



New Forest Non-Native Plants Project Control 2019

Parrot's Feather

Location within county:



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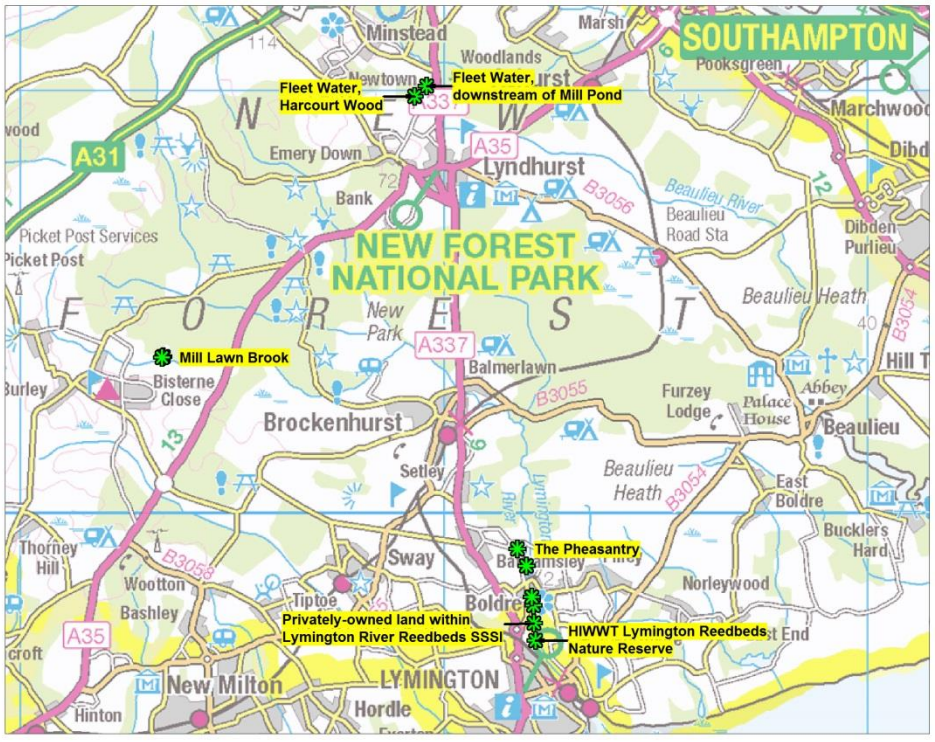
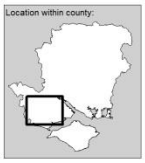
Curdridge, Hampshire
SO32 2DP



New Forest Non-Native Plants Project Control 2019

American Skunk Cabbage

Location within county:



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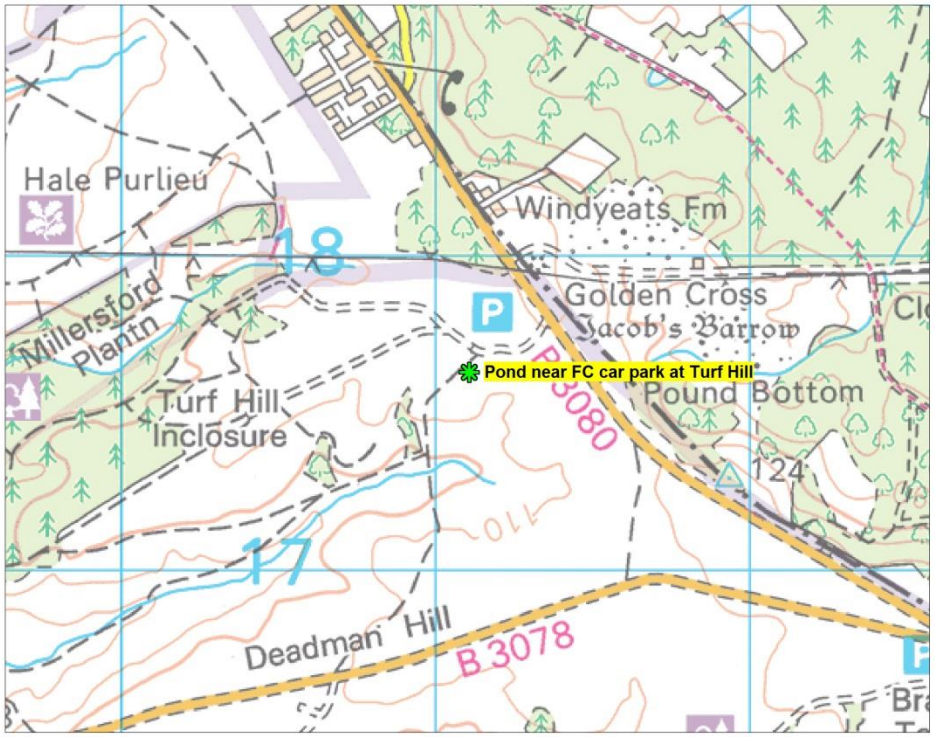
Curdridge, Hampshire
SO32 2DP

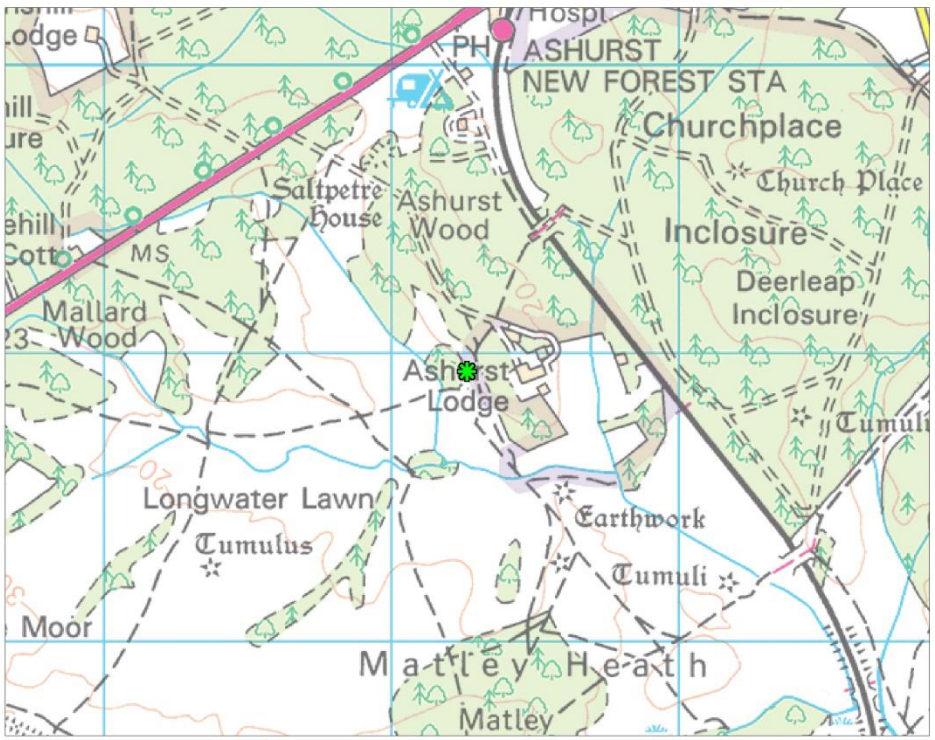


New Forest Non-Native Plants Project Control 2019

Golden Club
Orontium aquaticum

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP



New Forest Non-Native Plants Project Control 2019

Sheep Laurel
Kalmia angustifolia

Location within county:

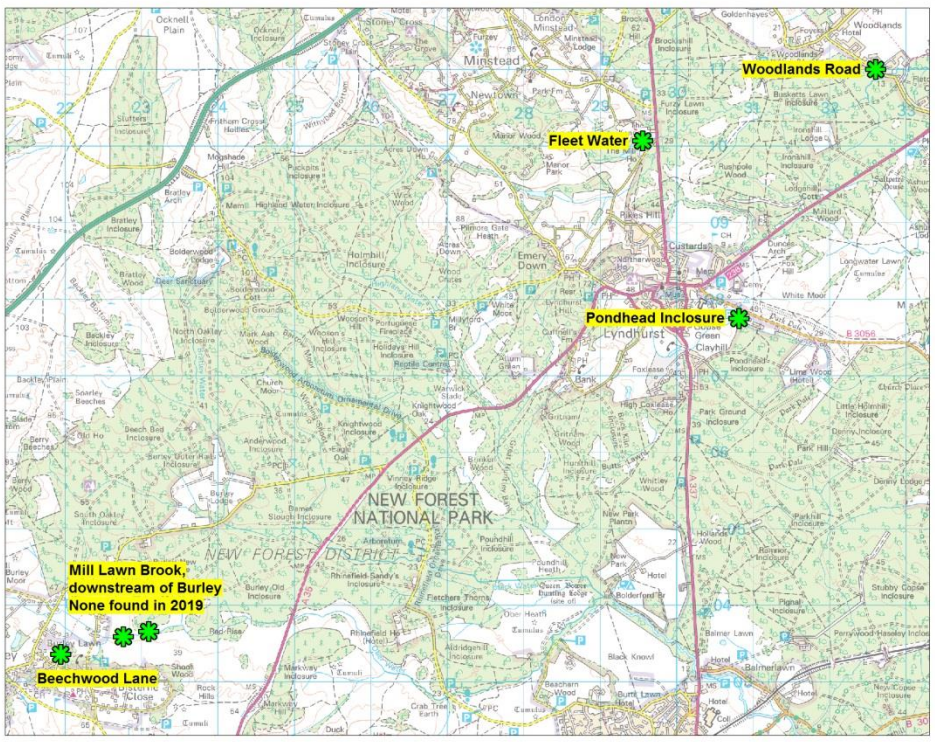
Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

New Forest Non-Native Plants Project Control 2019

Gaultheria
Gaultheria shallon

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

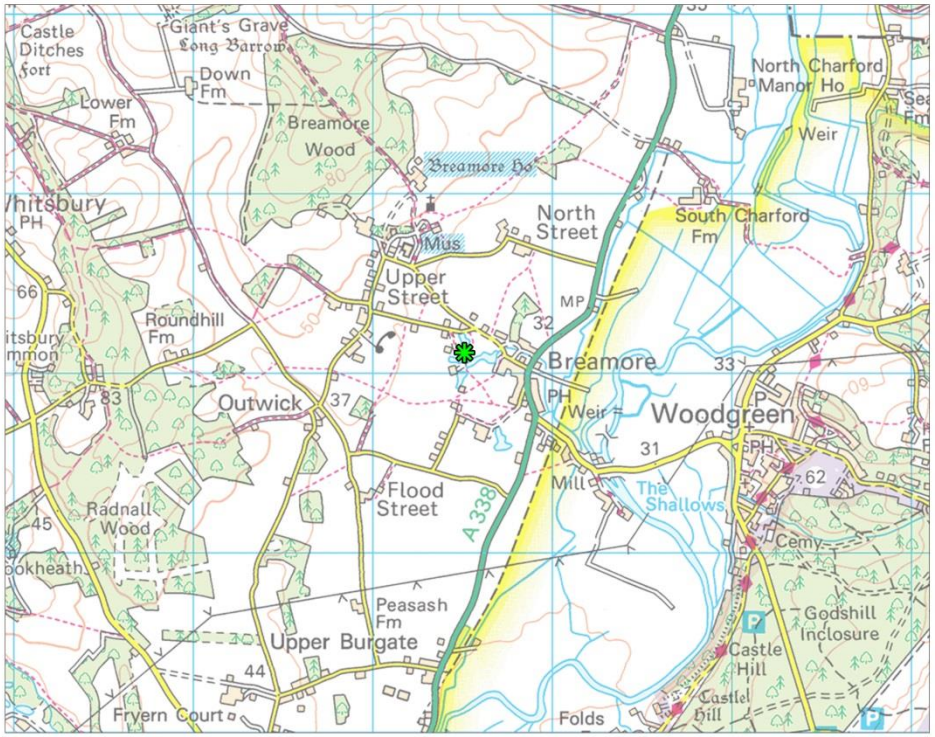


New Forest Non-Native Plants Project Control 2019

Montbretia
Crocosmia x crocosmiiflora

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP



New Forest Non-Native Plants Project Control 2019

Creeping Water Primrose
Control by Jo Gore
at Breamore Marsh 2019

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

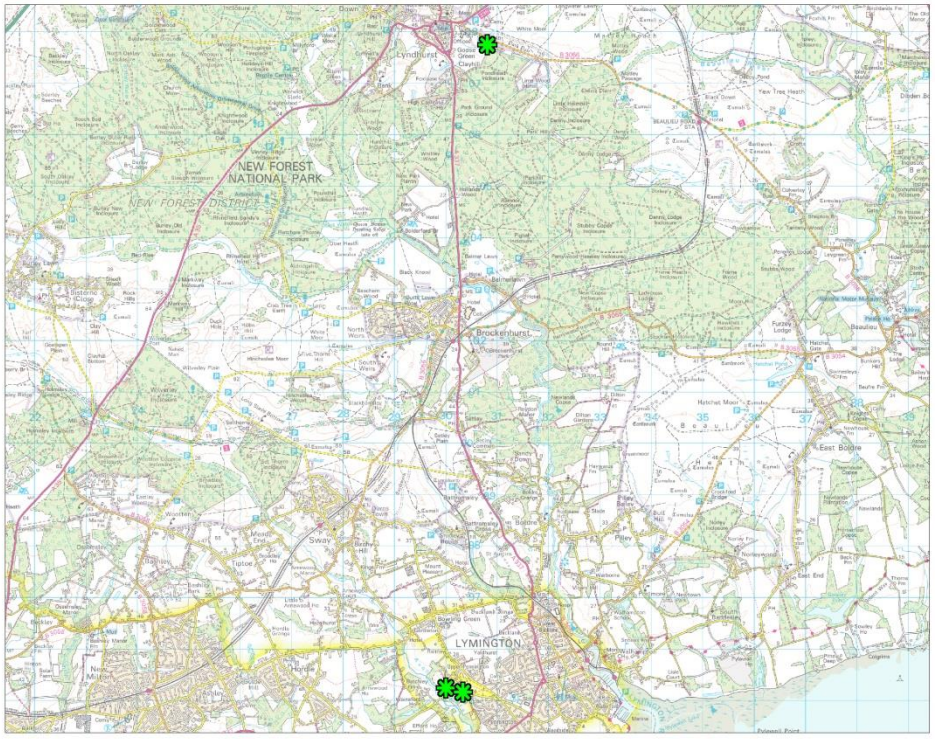
New Forest Non-Native Plants Project Control 2019

Variegated Yellow Archangel

Lamiastrum galeobdolon subsp. argentatum

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

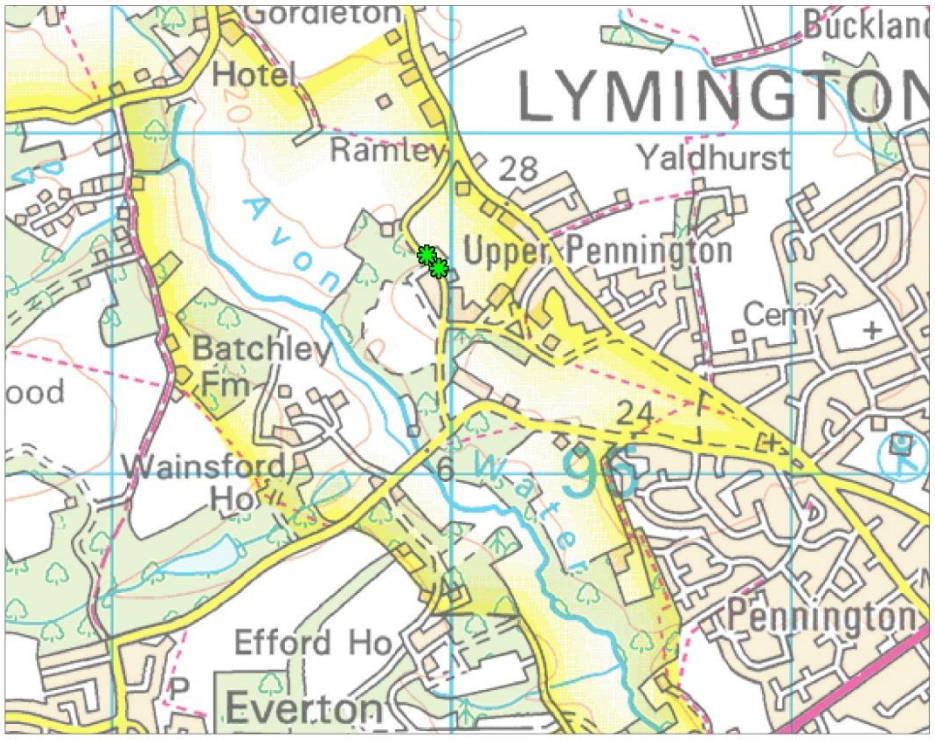


New Forest Non-Native Plants Project Control 2019

Bamboo

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

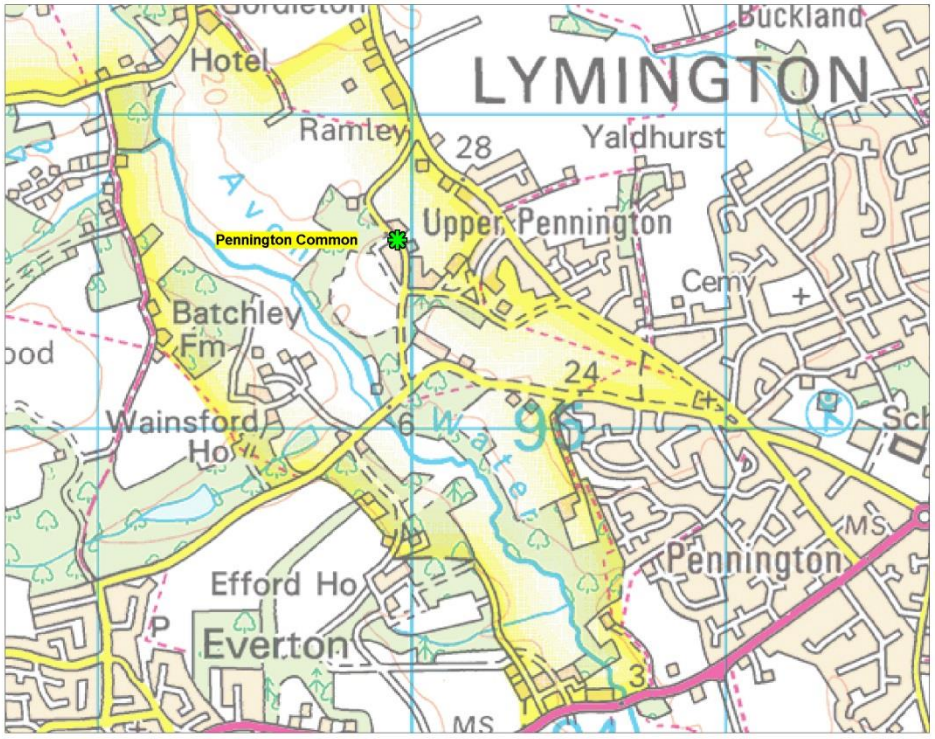


New Forest Non-Native Plants Project Control 2019

Golden Rod

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP



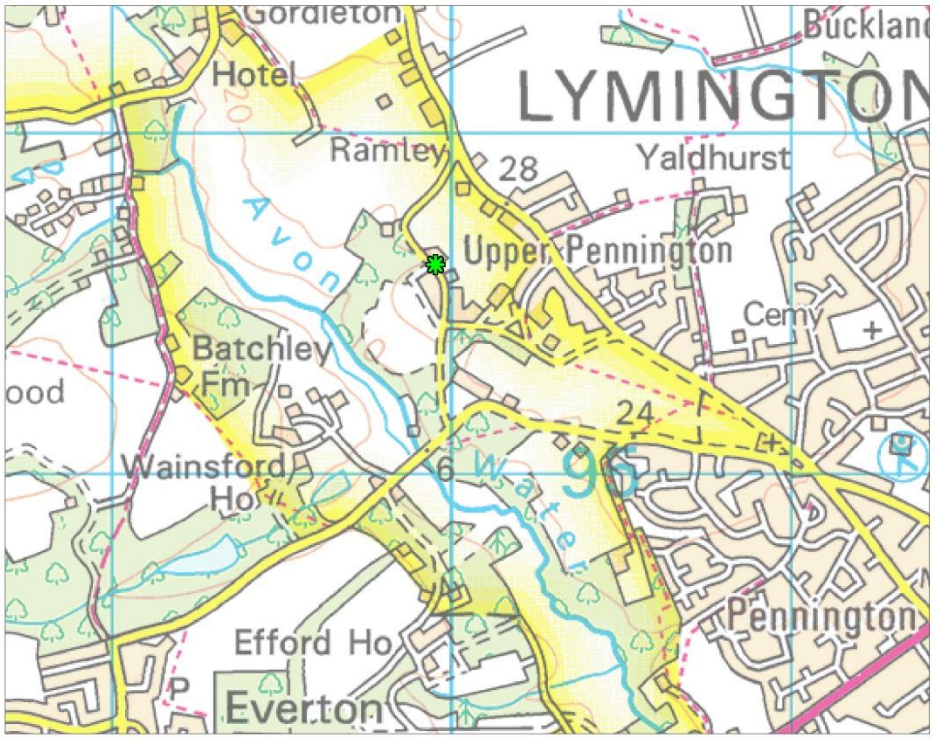
New Forest Non-Native Plants Project Control 2019

Periwinkle

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

Hampshire & Isle of Wight Wildlife Trust



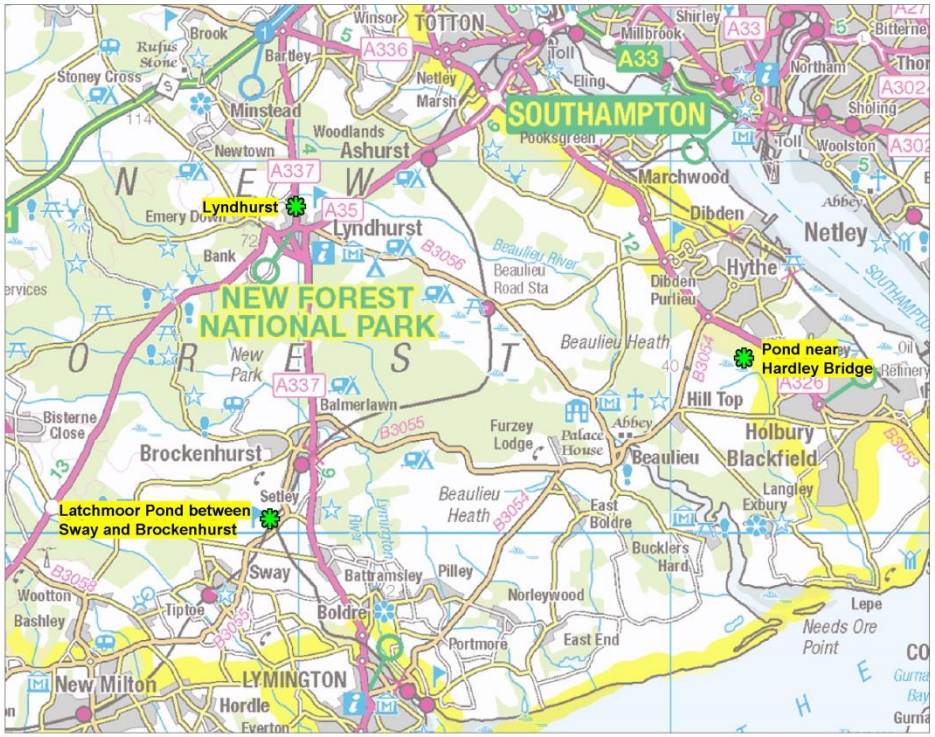
New Forest Non-Native Plants Project Control 2019

Spiraea

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

Hampshire & Isle of Wight Wildlife Trust



New Forest Non-Native Plants Project Control 2019

Iris laevigata

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

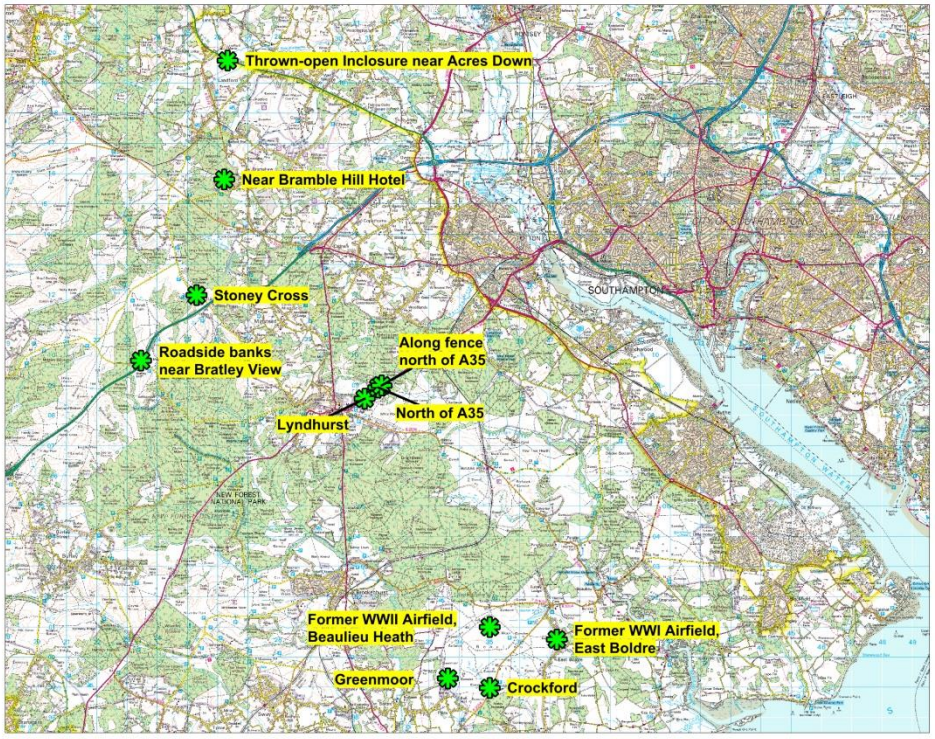
New Forest Non-Native Plants Project Control 2019

Three-cornered Garlic

Allium triquetrum

Location within county:

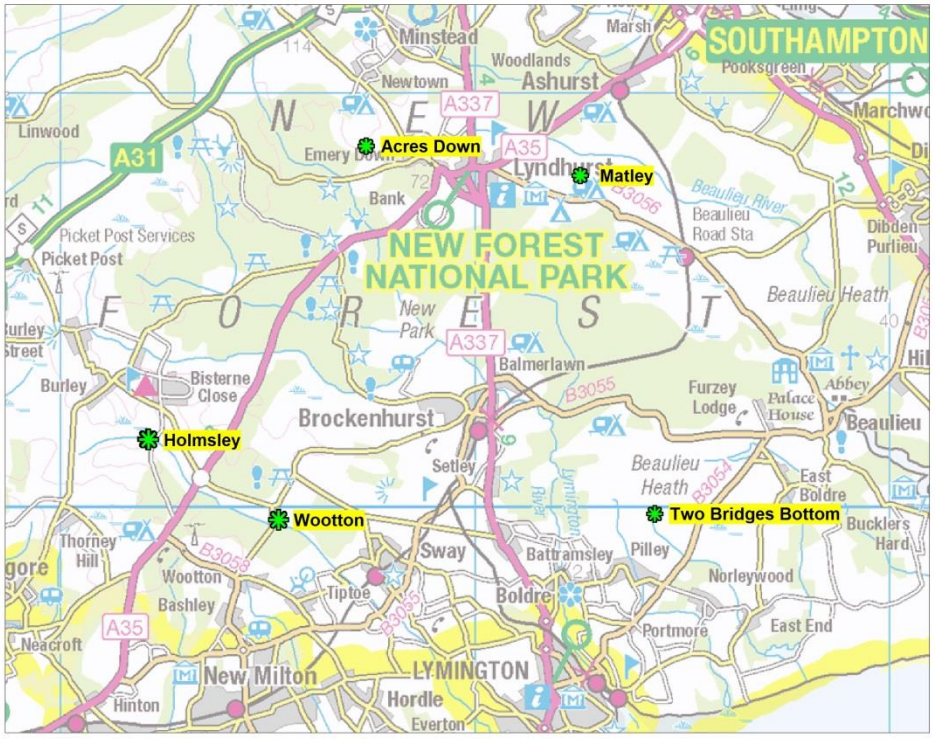
Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP



New Forest Non-Native Plants Project Control 2019

Cotoneaster

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP

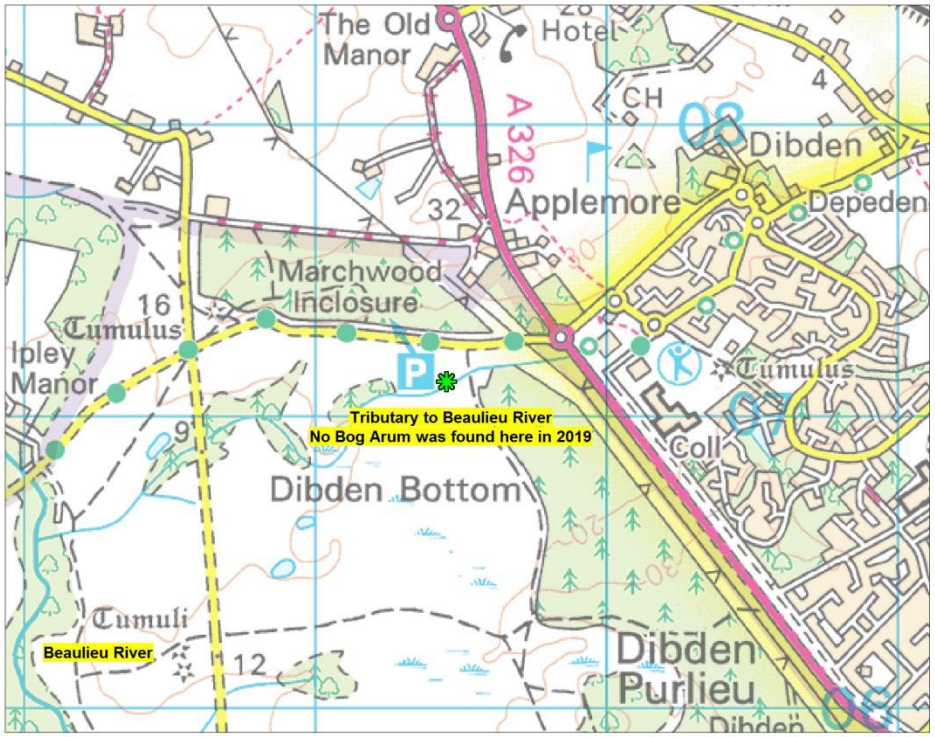


New Forest Non-Native Plants Project Control 2019

Pitcher Plant
Sarracenia purpurea

Removed by hand by volunteers

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP



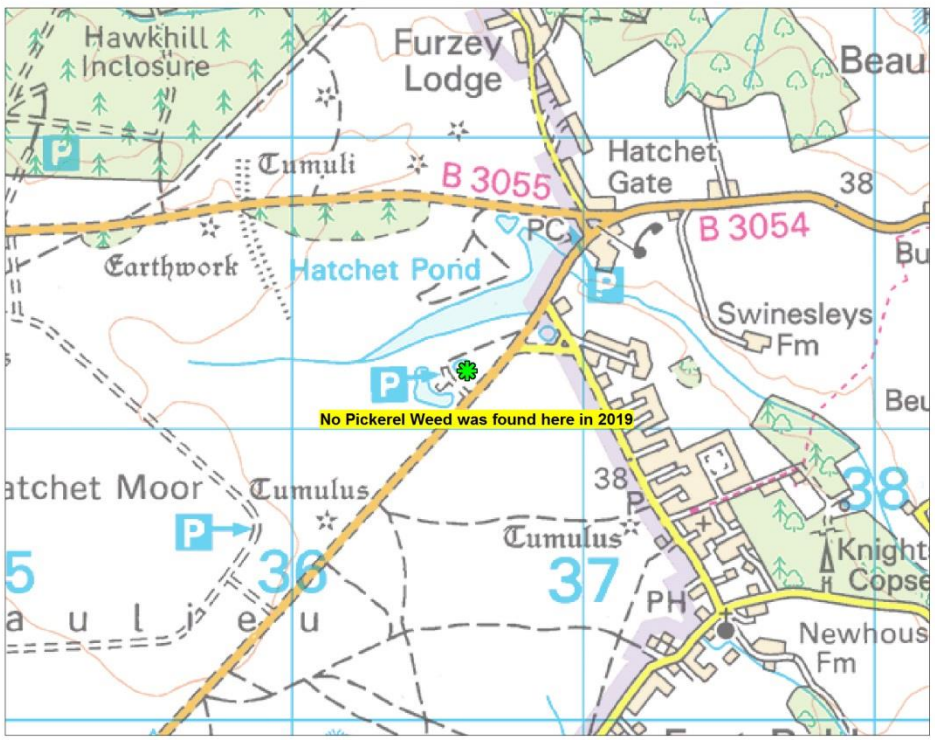
New Forest Non-Native Plants Project Control 2019

Bog Arum

Calla palustris

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP



New Forest Non-Native Plants Project Control 2019

Pickerel Weed

Pontederia cordata

Location within county:

Hampshire and Isle of Wight Wildlife Trust
Beechcroft House, Vicarage Lane
Curdridge, Hampshire
SO32 2DP