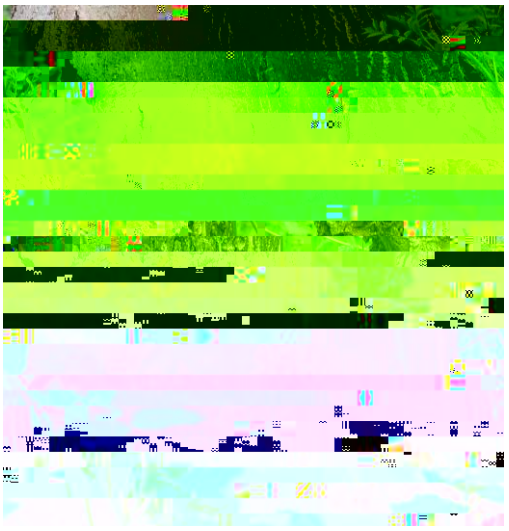
Ash Dieback (*Hymenoscyphus fraxineus* (T. Kowalski, Baral, Queloz & Hosoya)



Andy Karran

Relevant legislation: The Plant Health (Forestry) Order (Amendment, 2012)

Data availability: Poor (8 records)

Context: Ash Dieback is a fungal disease affecting ash trees (*Fraxinus excelsior*), previously known as *Chalara fraxinea*. It was first confirmed in the UK in nursery trees in 2012, although there is now evidence that it first entered Great Britain as early as 2006.[8] It is now widespread across England, Wales and parts of Scotland.[9] Symptoms of Ash Dieback include blackened leaves, leaf loss, crown dieback and bark lesions. Most infected trees will eventually die, although this depends on many factors such as tree age and location.[10]

Outlook: Ash trees account for almost 7% of Welsh woodland cover, estimated at around 16.5 million trees.[11] JNCC research has identified 44 lichen, fungi and invertebrate species that only occur on living or dead ash. A further 62 are highly associated with ash, and over a thousand are associated with ash; the list includes mammals, birds, plants, bryophytes, fungi and over 500 invertebrates.[12] It is not feasible to stop the spread of Ash Dieback, and the Welsh Strategy is focussed on research, monitoring and reactive management.[10] Nationally, research is focussed on identifying and breeding tolerant trees.[8] Recent research from France suggests that the disease is less severe when ash density is low and in isolated trees.[13]

Greater Gwent range: There are very few records for Ash Dieback: just five records within Greater Gwent, with the earliest in 2016. By contrast, mapping provided by Fera, Natural Resources Wales and Forestry Commission at hectad scale shows Ash Dieback to be widespread, dating back to 2014.[9] Ash trees are widespread across the area in both woods and linear features.[10]

This discrepancy could be due to several factors: time lags in reporting cases of Ash Dieback to Local Records Centres; the use of other recording pathways, such as internal organisational reporting, Observatree or Treealert; or lack of confidence among recorders in identifying Ash Dieback, especially as other diseases affecting ash can appear similar.

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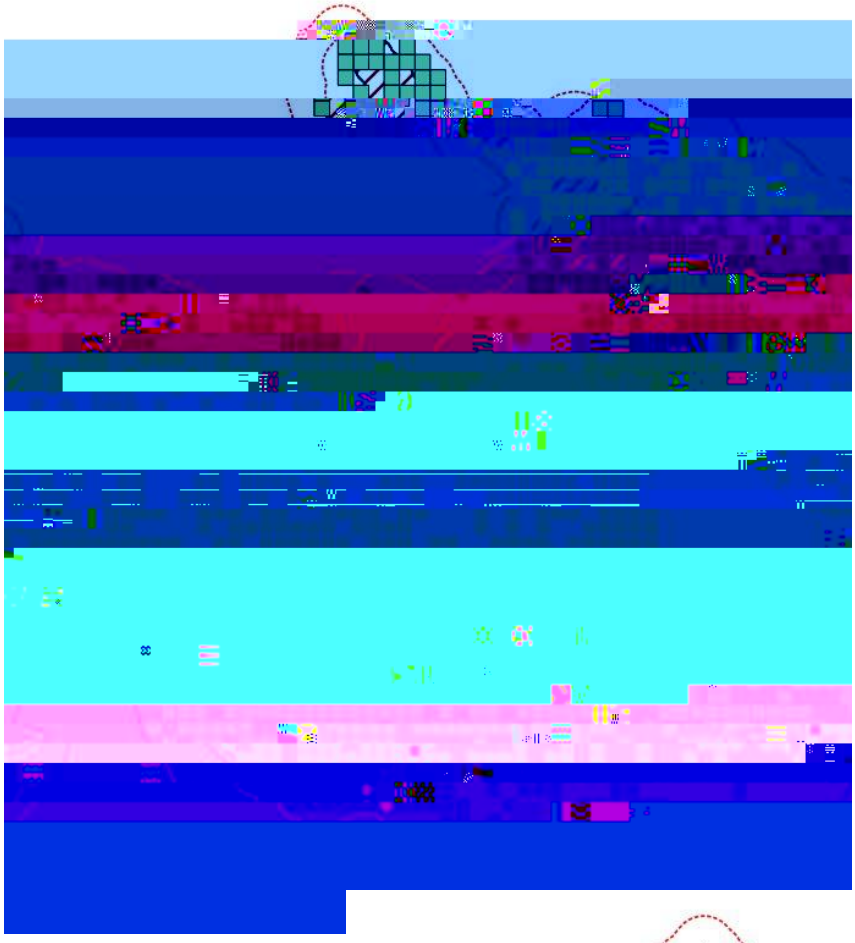
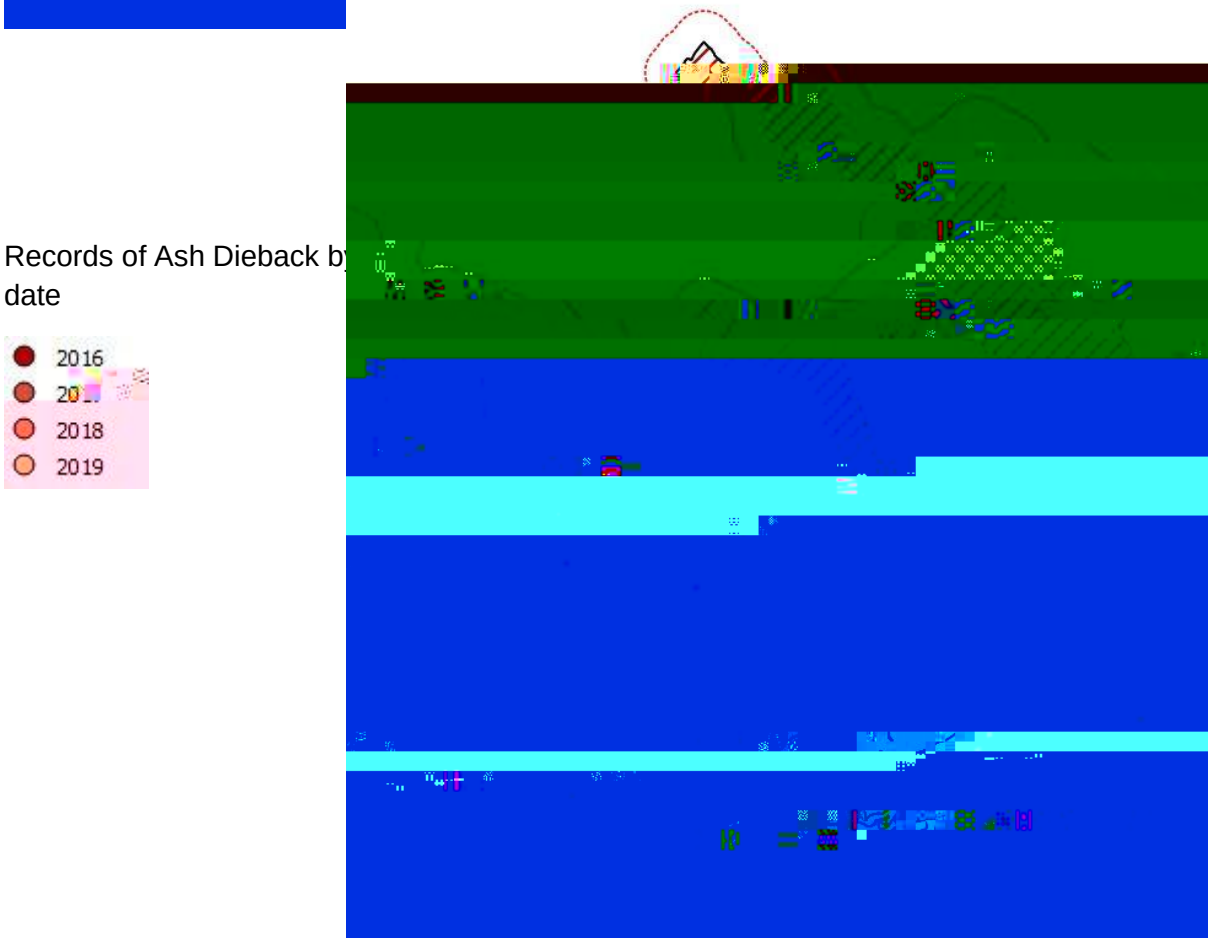


Distribution of Ash Dieback records across Greater Gwent (red), with monads with records of Ash 1970 2019 (green)



Records of Ash Dieback by date

Confirmed Ash Dieback infections

Population trends: There is not enough data to determine how Ash Dieback is spreading across Greater Gwent. It is apparent that it has moved across the area in less than a decade, but the route taken is not clear. The spatial pattern of cases (whether there are isolated cases, clusters or systemic infection) is unknown.

Protected sites: Of the five individual records in Greater Gwent, one is within a SSSI (Ruperra) and one within a SINC (Pentwyn Isaf Woodlands). Large areas of broadleaved woodland (a priority

Giant Hogweed – *Heracleum mantegazzianum* (Sommier & Levier)

Legislation: Wildlife & Countryside Act (1981, as amended) Schedule 9, Environmental Protection Act 1990.

Priority status: Long-term Management Priority (Wales)[5]

Data availability: Moderate (206 records)

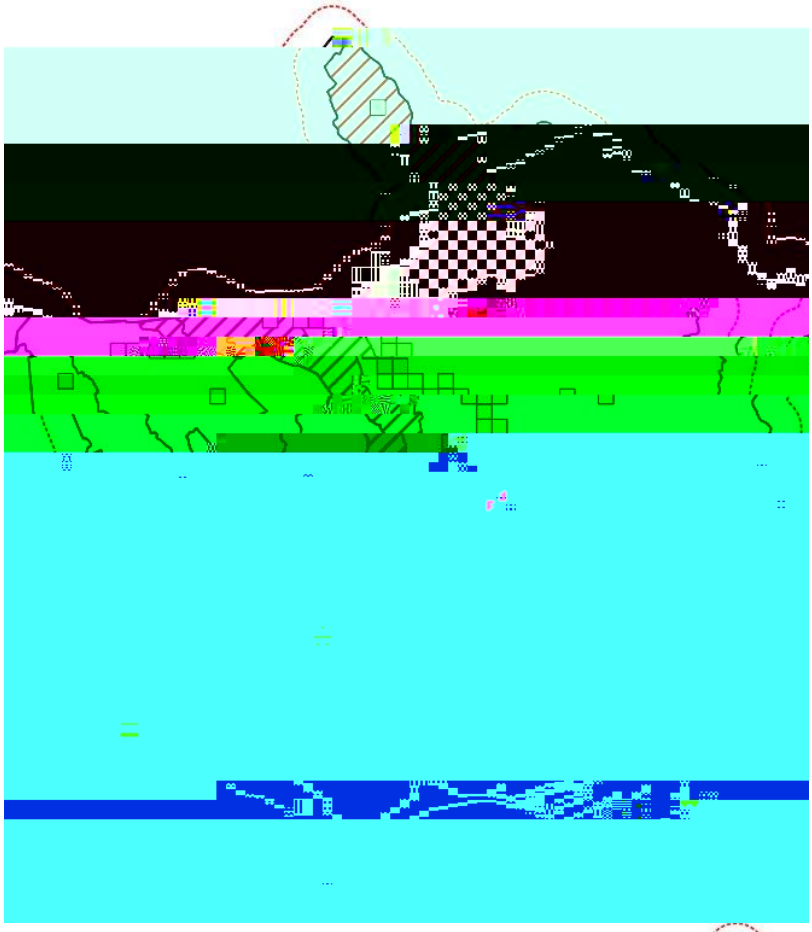
Context: Giant Hogweed was introduced to Britain as an ornamental plant in the nineteenth century, but now occurs alongside lowland watercourses and on rough ground. It resembles Common Hogweed (*Heracleum sphondylium*), but can grow up to 5m tall, with basal leaves reaching over 1m. Its large size means that it can outcompete native species, and contact with its sap can cause skin to become photosensitive, leading to serious burns.

Outlook: Giant Hogweed has spread across most of the UK, with the exception of upland areas, and has been spreading rapidly, despite control measures.[14] Both flooding and warm weather can increase growth and seed distribution, making it seem likely that climate change will exacerbate Giant Hogweed spread.

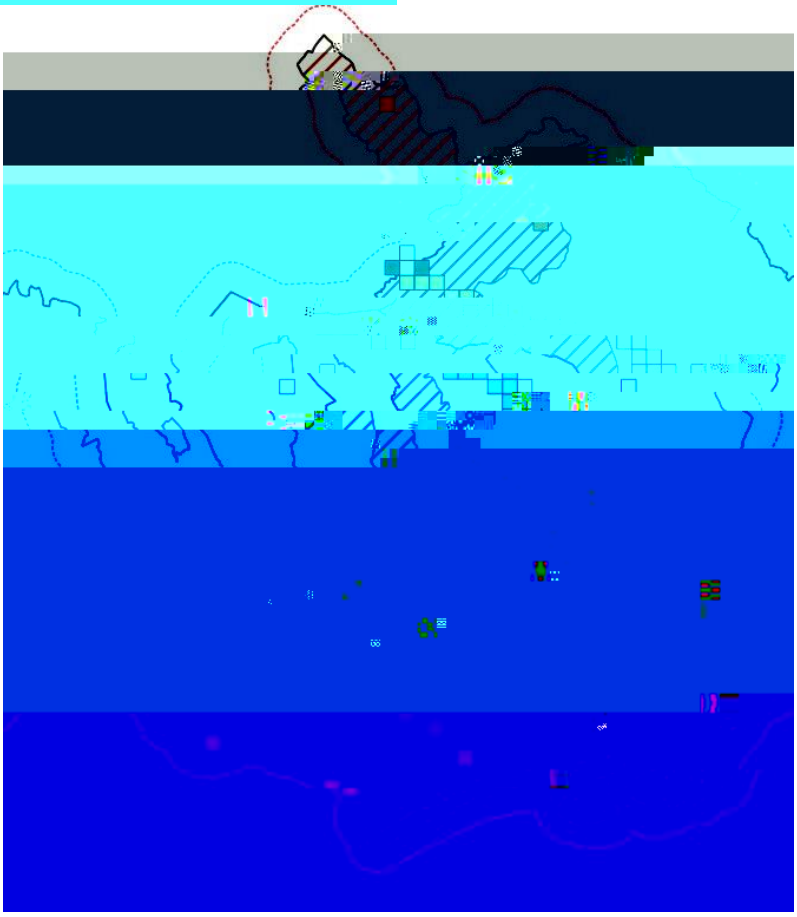
In Wales, the Wales Resilient Ecological Network (WaREN) project aims to develop a Wales INNS [illegible] coordinated way.

Greater Gwent range: Giant Hogweed has been found along almost the entire length of the Usk within Greater Gwent, with scatter

Distribution of Giant Hogweed records across Greater Gwent (max 18/km²)



Earliest records of Giant Hogweed by decade (spread)



Himalayan Balsam *Impatiens glandulifera* (Royle)

Legislation: Wildlife & Countryside Act (1981, as amended) Schedule 9

Priority status: Long-term Management Priority (Wales)[5]

Data availability: Moderate (1034 records)

Context: Himalayan Balsam (also called Indian Balsam } Œ W } o] u v [• , o u š • Á •] v š Œ } µ š } Œ] š] v] v 1930 and spread rapidly, especially along riverbanks. An annual plant with pink flowers, it grows up to 3m tall and produces seed pods that explode when touched, flinging seeds up to 7m away.[16] It forms dense stands which outcompete native species, and when it dies back in winter, riverbanks are left vulnerable to erosion. It also produces more nectar than native species, attracting pollinators away from them and reducing their fitness.[17] The cost of eradicating Himalayan Balsam from the UK was estimated at £150-300 million.[16]

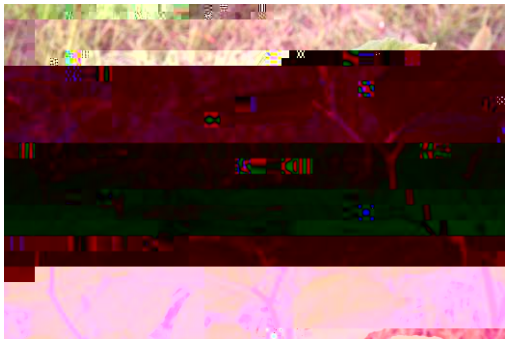
Outlook: Eradication of Himalayan Balsam seems unlikely given the cost of control methods. Many sites control balsam by manual pulling or herbicides, but without a coordinated approach at the catchment scale, recolonisation is inevitable. The Centre for Agriculture and Bioscience International (CABI) are currently researching the potential use of a rust fungus as a biological control.[18] In Wales,

Distribution of Himalayan Balsam records across Greater Gwent (max 8/km²)

Earliest records of Himalayan Balsam by decade (spread)

Control Measures: Most control measures in Greater Gwent have taken place at the individual site level, although the Wye and Usk have been systematically removing it from the Monnow catchment

Japanese Knotweed *Fallopia japonica* (Houtt.) Ronse Decr.



Andy Karran

Legislation: Wildlife & Countryside Act (1981, a
amended) Schedule 9, Environmental Protection A
(1990)

Priority Status Long-term Management Priority
(Wales)[5]

Greater Gwent data availability: Good (2617 records)

Context: Japanese Knotweed was introduced in th
mid-nineteenth century and spread rapidly acros
Britain. It has a rhizome structure and extraordinary regenerative ability: tiny fragments of stem and rhizome can quickly regrow into a new plant[20], and the entire population is believed to be the clones of a single plant.[21] Because it spreads so easily, Japanese Knotweed quickly colonises rivers, railways and other waste ground. Concerns that Japanese Knotweed could damage building structures have had negative impacts on the property market, although recent research suggests that it is no worse than other plant species.[22]

In terms of biodiversity impact, Japanese Knotweed forms monoculture stands, outcompeting native species. It can impact aquatic ecosystems through shading, and production of leaf litter, as well as leaving banks vulnerable to erosion in the winter. It can block sluices and drains, as well as paths, leading to a negative impact on recreation. Growth next to roads and railway lines can cause safety issues by obscuring signs and signals. Japanese Knotweed costs Great Britain an estimated £165 million every year[3].

Outlook: CABI trials with the sap-sucking psyllid *Aphalara itadori* have had limited success so far. Although the psyllid has been shown not to affect native plants, there have been difficulties in establishing self-sustaining populations.[23] Japanese Knotweed control is further complicated by an unwillingness from landowners to publish records, for fear of legal action, as experienced by Network Rail.[24] This also means that control efforts can prioritise protection of property over biodiversity issues.

Also of concern, Japanese Knotweed can hybridise with Russian Vine and Giant Knotweed, and the resulting hybrids can back-cross with the parent plants. There are indications that *Fallopia x bohemica* is more vigorous and persistent than either parent and can produce viable seed in certain climatic conditions. *F. x bohemica* is already present in Newport.[25]

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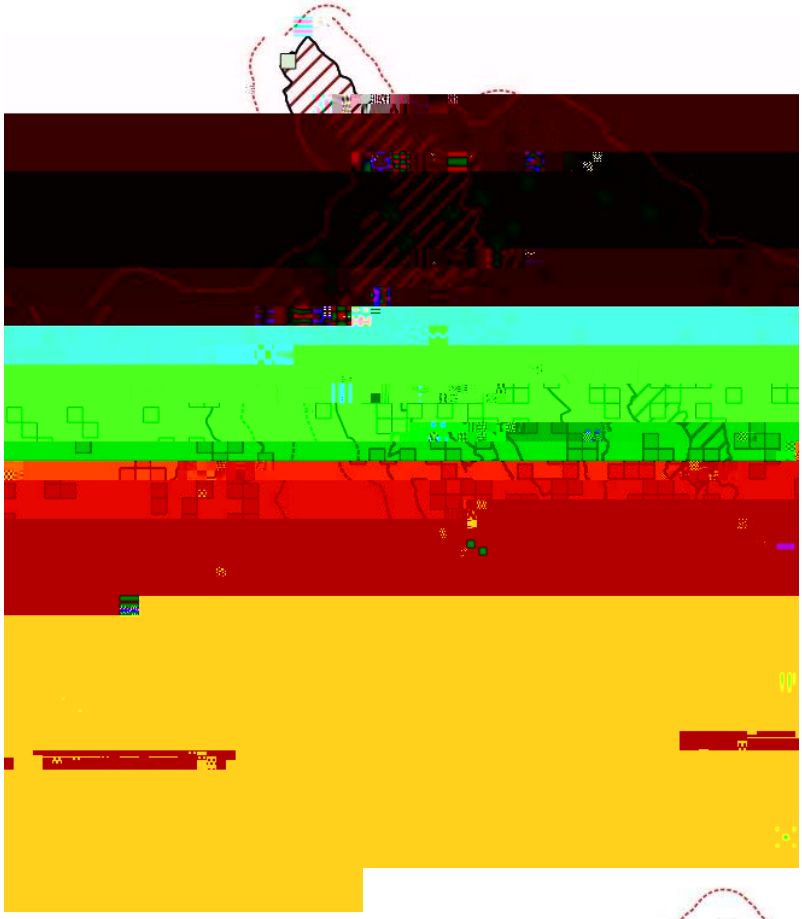
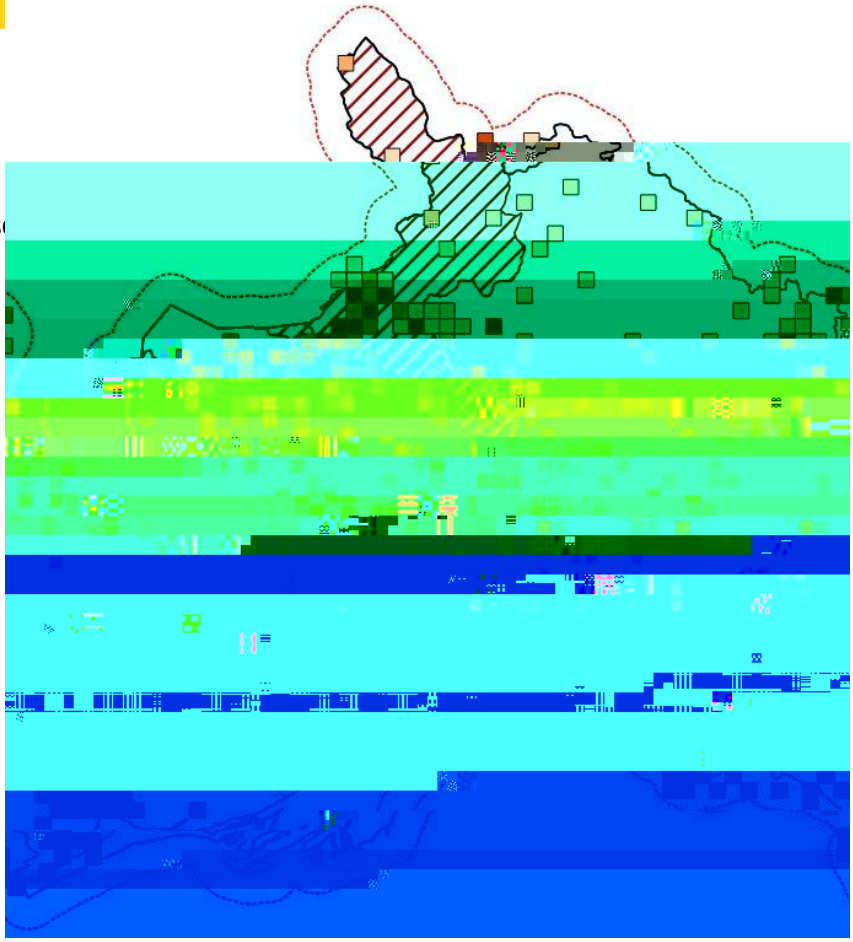
a coordinated way.

Greater Gwent range: Japanese Knotweed is found across Greater Gwent, with greater concentrations in the south and west, corresponding to the more urban areas (although this may also be a factor of recorder effort). Newport has a higher concentration of records due to recent county-wide dedicated surveys. When viewed in detail, the Newport records showed linear distribution of Knotweed along the Monmouth and Brecon Canal and River Ebbw, and along the

Distribution of Japanese Knotweed records across Greater Gwent (max 50/km²)



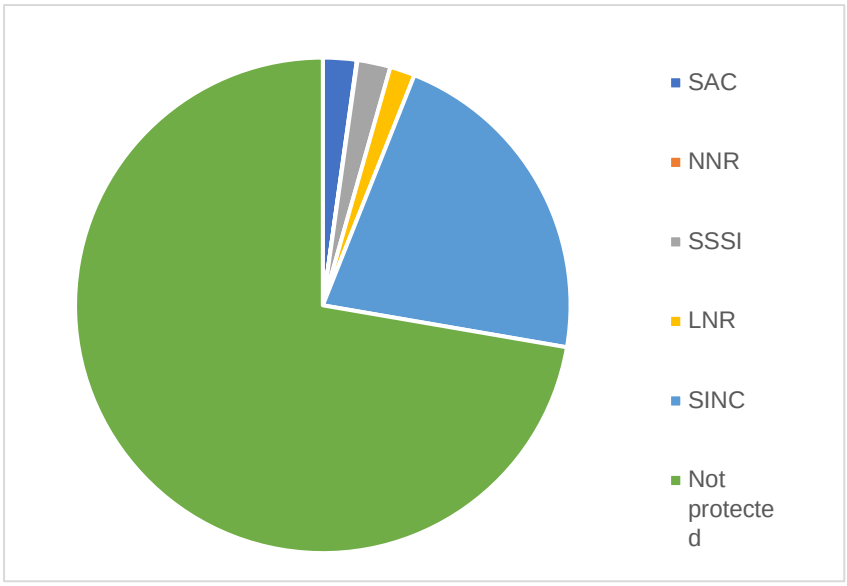
Earliest records of Japanese Knotweed by decade (spread)



Control measures: Each local authority in Greater Gwent has a programme of Knotweed control although the extent covered varies considerably. Stakeholders such as Network Rail and South Wales Trunk Road Agent (SWTRA) also have control programmes. However, coordinated approaches at the catchment level may be prohibitively expensive.

Protection: 24% of records come from protected sites, with high numbers of records from SINCs, particularly the River Ebbw, River Sirhowy, River Rhymney and the Monmouth & Brecon Canal. There are smaller numbers of records from the River Usk SAC at Newport, and scattered records from the Gwent Levels SSSIs. SINCs may be particularly vulnerable as they are less likely to be in public ownership, and have fewer resources available for their management.

Japanese Knotweed records from protected sites



Signal Crayfish *Pacifastacus leniusculus* (Dana, 1852)

Legislation: Wildlife & Countryside Act (1981, as amended) Schedule 9, The Prohibition of Keeping Live Fish (Crayfish) Order (1996).

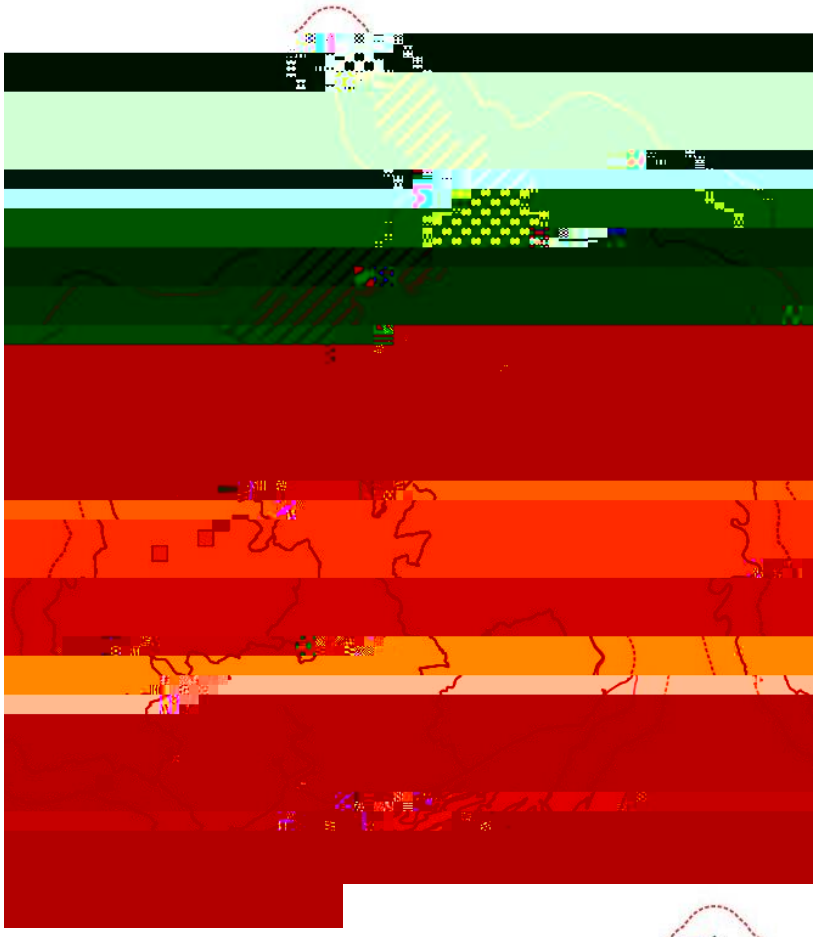
Priority status: Long-term Management Priority (Wales)[5]

Greater Gwent data availability: Poor (12 records)

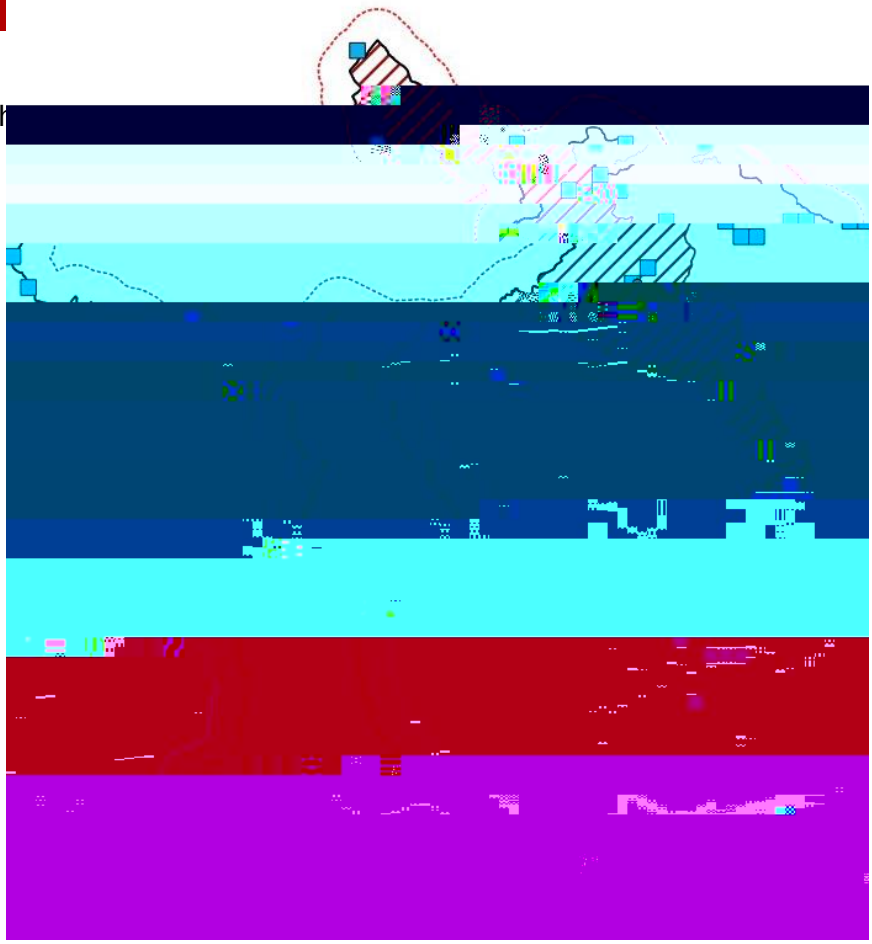
Context: Signal Crayfish were introduced to Britain in the 1970s as a commercial farmed species but escaped and spread rapidly across England and Wales[6,8]. Signal Crayfish are larger than the native White-Clawed Crayfish (*Austropotamobius pallipes*), which has declined by 50-80% across Europe[26] and is classified as Endangered at the global level[27]. Competition and transmission of fatal crayfish plague from Signal Crayfish is a significant cause of this decline.

Signal Crayfish also damage riverbanks by burrowing and predate fish eggs, affecting wild and commercial fish stocks[3]. There is also evidence that the presence of Signal Crayfish has a negative impact on aquatic invertebrates, lowering invertebrate density and species richness[28]. The annual cost of managing and mitigating Signal Crayfish is estimated at £2.7 million in the UK, and just over £500,000 in Wales.

Outlook: Options for Signal Crayfish control include trapping, biocides and barriers to limit colonisation of new areas. However, all have implications for other species, and most are only effective at suppressing, rather than completely eradicating, the population[31]. Current campaigns include promoting biosecurity (for example,



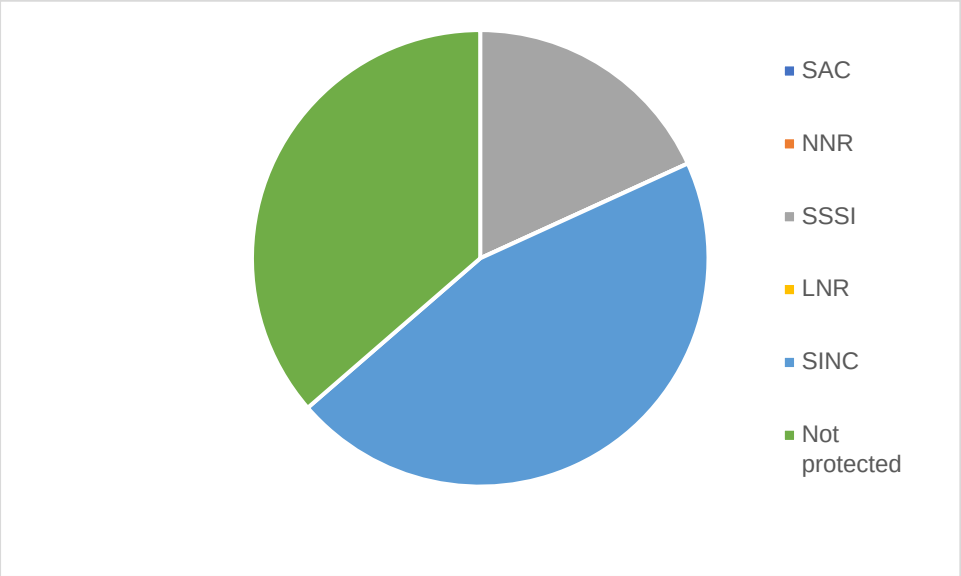
Distribution of Signal Crayfish records across Greater Gwent (max 150/km^2)



Records of Signal Crayfish (red) against monads with White-Clawed Crayfish records (blue)

Protection: 64% of records come from protected sites, with records from Keepers Pond within the Blorenge SSSI, and SINCs at Pen y Fan Pond, Blackwood Riverside Woods and the river Rhymney. It is important to note that a large portion of the river network within Greater Gwent is protected to some level.

Signal Crayfish records from protected sites



References

17. DEFRA. 2020. UK Biodiversity Indicators 2020. DEFRA, London.
18. GB Non-Native Species Information Portal. 2017. GB Non-native Species Report Card 2017: http://www.nonnativespecies.org/factsheet/index.cfm
19. Williams F, Eschen R, Harris A, Djeddour D, Pratt C, Shaw RS, Varia S, Lamontagne-Godwin J, Thomas SE and Murphy ST. 2010. The Economic Cost of Invasive Non-native Species on Great Britain. CABI, Wallingford.
20. Great Britain Non-native Species Secretariat. 2015. The Great Britain Invasive Non-native Species Strategy. DEFRA, Scottish Government and Welsh Government.
21. WBP INNS Group 2019. Invasive Non-native Species (INNS) Priority Species for Action in Wales. Welsh Biodiversity Partnership.
22. DEFRA. 2014. Protecting Plant Health: A Plant Biosecurity Strategy for Great Britain. DEFRA, Forestry Commission, Welsh Government and Scottish Government.
23. https://planthealthportal.defra.gov.uk/
24. https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/ash-dieback-hymenoscyphus-fraxineus/(accessed 06pRn 41.92 re W* n BT /F2 11.04 Tf 1 0 0 1 90.024 560

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37. Hollingsworth ML and Bailey JP. 2000. Evidence for Massive Clonal Growth in the Invasive Weed Fallopia Japonica. Botanical Journal of the Linnean Society 133(4): 463-472
38. Fennell M, Wade M and Bacon KL. Japanese Knotweed (Fallopia Japonica): An Analysis of Capacity to Cause Structural Damage (Compared to Other Plants) and Typical Rhizome Extension. PeerJ 6:e5246 https://doi.org/10.7717/peerj.5246
39. CABI. 2015. Progress with Weed Biocontrol Projects May 2015. CABI, Egham.
40.