



Grassrack Pondweed, *Potamogeton compressus*, in 2008

Report to the UK BAP Group

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Introduction

Grassrack Pondweed, *Potamogeton compressus* L., has been on the Biodiversity Action Plan since the first list was published (English Nature 1998) and it has been seen as a species of interest for nature conservation since *Scarce Plants* (Stewart, Preston & Pearman 1994). Over this time there have been numerous surveys and studies, and a lot of data has been collected.

It is a difficult species to study. Populations tend to appear for a short period of time and then go again, leaving uncertainty about how many sites there are for it at any point in time.

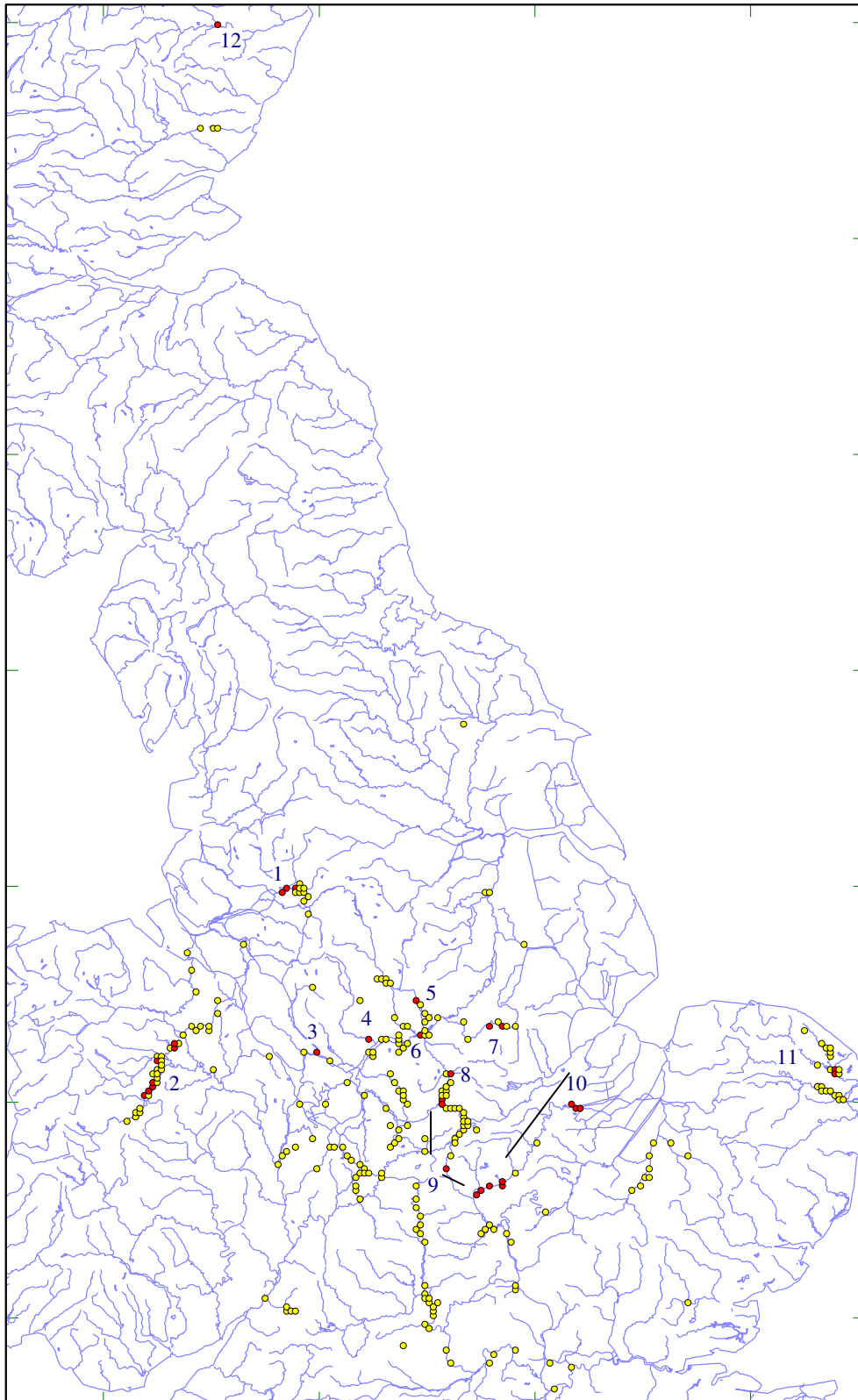
Identification is also difficult – it is often confused with *P. acutifolius* and *P. obtusifolius* – so great care has to be taken to validate new records.

The purpose of this report is to briefly review current knowledge and provide information to the BAP Group on its status.

Grassrack Pondweed is strongly associated with rivers, although it is rarely found in the fast-flowing main channel. It typically occurs in oxbow lakes, drainage ditches, mill ponds and canals that are connected to base-rich lowland rivers.

A total of 121 hectads have records of Grassrack Pondweed. Since 2000 it has been found in just 22 of these, and there are just 15 discrete populations, which are listed below, with notes on the history and ecology of the sites.

Current Sites



Dots are 3km circles centred on a 2km square. The backdrop shows the rivers and canals. Red dots are for post-2000 records. Numbers indicate the current sites.

- 1. Ashton Canal, Manchester** (SJ89, v.c. 59). It was first recorded here in 1939 by W.G. Travis in the canals on the eastern side of Manchester, some of which have now been destroyed. By 1990 it had migrated west to its current location near the city centre, where it was found by Nigel Willby. Currently there are many hundreds of plants in several side arms and basins along the canal, and the population seems quite secure. The Manchester populations provide evidence of historical dispersal, as there appear to be no native sites nearby. British Waterways staff attempted to introduce it in 2003 from here to the Huddersfield and Rochdale canals (where it had not been recorded previously), but we have not heard whether the translocations succeeded.
- 2. Montgomery Canal** (SJ20, SJ21 & SJ22, v.c. 47). The first record was by Eleanor Vachell at the very northern end of the canal (SJ43) in 1927; but it was probably already throughout, as Henry Haines collected it at Welshpool in about 1935. Nevertheless, the colonisation of this canal was probably a 20th century event, as it was a fairly well studied site in the 19th century. The population in the Welsh sections is huge, with many thousands of plants. The suitability of this site may be attributable partly to the good quality water, which mostly comes from the River Tanat and is quite free-flowing several places; and partly due to the low level of boating, as there is still a dry section at the border which isolates it from the rest of the canal network. The Shropshire lengths – which were SSSI – were restored to navigation with promises that traffic levels would be kept low enough to ensure the survival of this species; but that promise has not been kept and virtually all aquatic plants of any species had gone by 2002.
- 3. River Sow at Shugborough** (SJ92, v.c. 39). Grasswack Pondweed has been known in the vicinity of Stafford since 1850, when it was collected there by R.C. Douglas, but it was not until 1974 that it was found in the ornamental arm of the River Sow at Shugborough Park by Bryan Fowler. This is a landscaped lake, connected to the Sow by sluices at both ends, situated within the grounds of a National Trust property – the ancestral home of Lord Lichfield. The lake is lovingly maintained by Mike Bradbury, the head gardener, and dredged in sections every few years, sometimes with the assistance of the Environment Agency. This is probably the only ‘conserved’ site for *P. compressus* in the country, in the sense that the landowners value it and work positively for its protection. The Sow is a tributary of the River Trent – one of the major catchments within which *P. compressus* is naturally found, but how it got as far upstream as Shugborough is a mystery. It is a plant that is very rarely recorded in swift-flowing rivers (what are the chances that it would be identified?), but it is (or was) clearly present in some, so the Sow is presumably one of its genuinely native sites.
- 4. The Old River Dove at Marston** (SK22, v.c. 39 & 57). This area has long been a hotspot for Grasswack Pondweed, with records dating back to 1857 for the River Trent, the Trent & Mersey Canal, and the River Dove. The Old River Dove at Marston is an oxbow lake, cut off by river engineering rather than natural processes, and managed by an angling club from Burton-upon-Trent as a fishing lake. It is a SSSI, but it has little ecological interest other than the pondweed, and it is surrounded by arable fields to within a few metres. There might be other sites for Grasswack Pondweed along the River Dove, but there are dozens of similar lakes and a systematic survey has never been carried out.
- 5. Erewash Canal** (SK44, v.c. 57). It has been recorded in this area since Linton’s Flora of Derbyshire in 1903, and the Erewash Canal is a well-known site for it. The current locality near Eastwood was found by Nigel Willby in 1990, but it seems quite likely that it could still be elsewhere on the canal, or on some of the other canals in the vicinity where it has been recorded in the past.
- 6. River Trent at Sawley** (SK43, v.c. 56). Although the Trent south of Sawley is a maze of channels, gravel pits and oxbow lakes, the current site is in the main channel just below the confluence with the River Derwent, where *P. compressus* was found by Peter Sibley in 2003. As mentioned above, it could be very difficult to find it in even a moderate current, and we have no idea how many sites there could be for this elusive species. There have been other records for

the Trent, however, which is evidently a fairly good river for it. At Derby Museum there is a 1950 record for what could easily be the same place – the location is given simply as ‘Sawley.’

7. The Grantham Canal (SK73 & SK83, v.cc. 55 & 53). This has been a site for *P. compressus* since 1903, when it was collected by W.A. Vice at Redmile (SK7935, v.c. 55). There have been records for it there every few decades since then, and it is still frequent along a few kilometres of canal; this is probably the second largest population in Britain. The associated flora is very rich, with several other species of pondweed and many other wetland plants.

The canal is being progressively redeveloped for leisure boating, and where this has already happened the diversity of the aquatic flora has collapsed, even before there are high levels of boating, with *Elodea nuttallii* becoming overwhelmingly dominant. The remaining sections towards Grantham are SSSI and are popular for fishing and walking, but there seems little chance that they will be protected from the ‘restoration’ process.

8. River Wreake at Wanlip (SK61, v.c. 55). An entirely new site and hectad for this species was discovered in 2006 by Chris Hill and Andy Lear at this gravel pit adjacent to the River Wreake. The waterways here are a maze of channels connecting canals, lakes and rivers, including the nearby River Soar, which is an old site for *P. compressus*. There were huge numbers of plants present, exhibiting the natural lifecycle of this species: to lurk in small quantity throughout a river system ready to exploit oxbow lakes and temporary pools that would naturally form in an unmodified floodplain. The current practice of creating boating and fishing lakes from gravel pits mimics this natural process, and seems to benefit *P. compressus* very considerably. Hill & Lear recorded no other uncommon species, and it seems this site is an example of a recently colonised waterbody that has not yet developed a diverse flora.

9: Grand Union Canal: the earliest records for the Leicester area are from the River Soar (e.g. F.T. Mott, 1884), but the only current site is the Grand Union Canal (SP59 & SK50, v.c. 55), where it was first recorded in 1890 by E.F. Cooper. Grasswack Pondweed grows along a couple of kilometres of this canal, along with a host of other uncommon aquatics. An important feature of this site is the width of the canal, which means that the wash from the boats is dissipated without causing too much disturbance to the sediment or erosion of the banks.

At Watford Locks (SP56, v.c. 32) a series of balancing lakes maintains a small population of Grasswack Pondweed, much to the disgust of the lock keeper. It was first recorded here by J.L. Fielding in 1956 and has apparently been here ever since. It is undoubtedly a vulnerable population, but it seems possible that there may be other sites not yet discovered along the length of this canal.

The third site along the Grand Union Canal is at Northampton (SP75, v.c. 32), where it was first recorded by H.N. Dixon in 1887, and was still present in 2006 (Hannah Graves, SP7459). *Potamogeton praelongus* was also present. Tony Balbi found it not far away at SP7257 in 2005.

10. River Nene (SP76 & SP86, v.c. 32). An entirely new site was found in 2003 in a marina at Weston Favell Mill (SP7960, S.J. Whild, G.M. Gent & A.J. Lockton). The Nene is a remarkably clean river, with freshwater sponges and a host of aquatic macrophytes present. Where there is slow-flowing water in backwaters, Grasswack Pondweed seems to occur with remarkable frequency, although it does not necessarily persist.

At Earl’s Barton (SP8561) it was first recorded by George Crawford in 1984, but that was in an oxbow adjacent to the river. The current site is in a side channel of the Nene itself, in a pool below a lock. Only a few plants were seen there in 2007 (Whild, Gent & Lockton).

Natural England’s Stewart Clarke found a new population almost on their doorstep, in the Nene at Peterborough (TL1997, v.c. 32), in 2005. A second nearby site at Thorpe Marina (TL1798) was found by Richard Chadd of the Environment Agency in 2006. It seems to be quite abundant there, but no interesting associates have been noted.

11. Upton & South Walsham Marshes (TG31, v.c. 27). Grasswrack Pondweed has been known in this area since 1915, when C.E. Salmon and J.W. White found it at nearby Ranworth Marshes. The current site was found in 1959 by G.H. Roche & E.L. Swann, and there are now effectively just two drainage ditches where it grows. Norfolk has been a focus for introductions for decades, with numerous attempts to create new sites for it, but no evidence that it persisted in any of them for more than a few months. Quite why it will grow in one ditch but not another is unknown, but that does not seem to deter the experimenters.

12. The Loch of Aboyne (NO59, v.c. 92) is the final current site. It was first recorded here as recently as 1978 by B.M. Gerrie, and the loch, which is artificial, has few other aquatic species. There are three other lochs in Scotland where *P. compressus* has been found, but it was last seen in Ochterlony Loch (which is nearly 50 kilometres away) in 1943.

Discussion

This list of sites, and their histories, produces an intriguing insight into the ecology of the species. It can evidently colonise new sites quite readily; an attribute common to many aquatic plants. Distances of at least a few kilometres can be crossed, including over land. This is most likely to be by bird transport of seeds, although human transport of turions cannot be ruled out.

The main route of dispersal, however is along water courses, and the general mechanism is presumably as follows: a population exists at some upstream location, possibly in a fairly stable site such as a drainage ditch, mill pond or oxbow lake. Each autumn this population produces a mass of turions and seeds which are washed downstream in the winter floods. Some of those propagules establish themselves in moderately swift-flowing sections of the river, where they are unlikely to flower (or be detected by botanists) but will continue to produce turions. Others will find themselves in an ideal situation such as an oxbow lake or gravel pit, where they will flourish and become abundant for a period of a few years. But oxbow lakes and other still waterbodies fill with vegetation or become eutrophic, and they cannot sustain populations of Grasswrack Pondweed indefinitely.

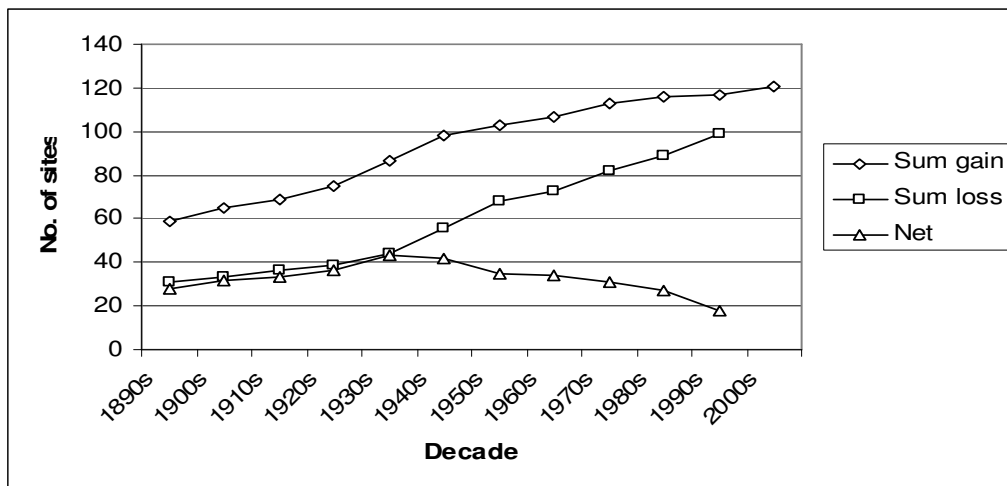


Fig 2: The number of new sites (1km squares) for *Potamogeton compressus* discovered (top line) and the number lost (middle line) each decade, showing that at no point in history have there been more than 36 extant sites known (this was in the 1980s). This species seems to colonise new sites at approximately the same rate as it is lost from old ones. On average, it persists for just 15 years in a site, although in the best sites it has been present for centuries.

Thus we have a plant that is widely and rather cryptically distributed throughout the waterways of Britain. Many sites are temporary, but new ones are constantly springing up. An important subset of sites are those where suitable conditions are maintained for decades or even centuries.

These would naturally include the upper floodplains of rivers and places such as the outflow streams of mesotrophic lakes, where a gentle current helps to maintain clear water and open conditions. In more modern times, canals, drainage ditches and millponds have fulfilled this role. In these sites, a long period of stable conditions has often led to the development of very rich aquatic communities which can often include many species of pondweeds, other aquatic plants such as Floating Water-plantain, *Luronium natans*, and organisms such as freshwater sponges.

These long-term sites are the ones that that matter most for nature conservation. It is all but impossible to manage whole river catchments for temporary pools and oxbow lakes, and apart from the transient populations of Grasswack Pondweed, these sites are often not of any great ecological interest. But the few permanent sites are of enormous value for their rich assemblages of plants and animals, and as there are only about half a dozen of them in the whole of Britain, it is conceivable that they could be protected from development. Protecting such sites would go a long way towards conserving the metapopulations distributed throughout the country as well, as they would serve as sources of propagules for the colonisation of new sites.

Currently the Biodiversity Action Plan places its emphasis on action rather than passive conservation of existing sites. To this end there has been a focus on growing the plant cultivation and introducing it into new sites. To date this appears to have been entirely unsuccessful but, ironically, dispersal is the one thing that *P. compressus* does really well, so there is probably little need to do this.

References

- English Nature. 1998. *UK Biodiversity Group Tranche 2 Action Plans Vol. 1 – vertebrates and vascular plants*. Publicity & Grants Team, English Nature, Peterborough.
- Stewart, A., Pearman, D.A., & Preston, C.D. 1994. *Scarce Plants in Britain*. JNCC, Peterborough.