Reviewed April 2015

Species Action Plan: Purple Broomrape

Introduction

Scope

This Species Action Plan is for purple broomrape (also known as yarrow broomrape), *Orobanche purpurea*. Actions to conserve this species will include those to improve the condition of the habitats upon which it relies. Reference should be made to the relevant Habitat Action Plans listed in the related plans and policies section below for general habitat management. This plan identifies actions which are specific to purple broomrape.

Vision Statement

To maintain and enhance the number, size and distribution of populations of purple broomrape in Pembrokeshire.

Description of Species

Description and habitat requirements
Purple broomrape is an annual or a short lived biennial. It is generally parasitic on yarrow (*Achillea millefolium*), although other host plants such as wormwood (*Artemisia absinthum*) have been recorded. It has bluish stems that grow to up to 45cm high, and bluish-violet flowers. Purple broomrape is capable of prolific seed production (which may be poorly dispersed), although its appearance from year to year can be erratic at some sites. It is a member of the broomrape family which generally shows a preference for warmer summers. It is usually associated with dry, undisturbed grasslands on base-rich (alkaline) soils and most of the British records are from old banks/roadside verges or cliff-top/coastal grasslands.

Reviewed April 2015

Distribution in Pembrokeshire

Purple broomrape occurs at Manorbier and Tenby in Pembrokeshire. At Manorbier, it is on dry fixed-dune grassland overlooking the car-park. It has also been recorded in the bank/roadside verge immediately below Manorbier churchyard wall, but has not been seen there since 1992.

It was rediscovered at Tenby in 2014 growing on a steep sandy slope over limestone at Windmill Hill. Its former Tenby site was in old allotments, not far from Windmill Hill, where it had been recorded between 1906 and 1932.

There is one other pre-1970 record from Bosherston, where it was last seen on the track between the Green Bridge and Broadhaven in 1942.

Population size

The appearance of purple broomrape at Manorbier is erratic (it was not seen in 1998 or 1999). At the main site (fixed dune grassland), the numbers of flowering stems seen in the past 14 years ranged from one (2000; 2002) to 40 clumps many with multiple stems in 1991 and 48 in 1997. The highest count obtained at its second site (below the churchyard wall) in the same period was 6 (1991). Despite careful searches it has not been found at Manorbier since 2005 when 7 flowering stems were counted at the main site.

There were 6 flower spikes close together at Tenby in 2014.

Trends

The re-appearance of the plant at Tenby in 2014 and its failure to appear at Manorbier since 2005 makes it difficult to be sure about population trends in Pembrokeshire.

Conservation status
European: Not thought to be threatened at European level.

UK: Listed in the British, and English, Red Data Books(vascular plants) as "vulnerable". Wales: Listed in the Red Data List (vascular plants) as “critically endangered”. The Pembrokeshire populations are the only extant ones in Wales. The Freshwater East to Skrinkle Haven SSSI boundary was amended to include the purple broomrape site at Manorbier. Purple broomrape is listed on Schedule 8 of the Wildlife & Countryside Act 1981.

Threats

Threats to this species come from:

- **Changes in or cessation of grassland management:** At Manorbier, purple broomrape is more-or-less confined to a single area of fixed dune grassland which (in the past) was grazed by ponies or cattle and by rabbits. Grazing pressure was instrumental in maintaining short, open swards, in which the host plant (yarrow) could thrive. Short swards may also have facilitated warmer soils which could favour germination and development of the plant, much of which is below the soil surface. The cessation of grazing and absence of regular mowing resulted in the development of dense, rank grassland in which the host plant was unable to thrive. Annual late summer cutting and carting was restored to the main site in 1998, resulting in almost immediate improvements in the sward. Suckering blackthorn and bracken, however, are a threat and it may be necessary to supplement annual summer mowing with the reintroduction of light autumn and winter grazing (eg by ponies or goats). Grazing by ponies would help to create and maintain open, bare areas of soil which would help to ensure that seed comes into contact with the host plant.
- **Changes in soil nutrient levels**: Purple broomrape seems to favour very free draining, base-rich, nutrient poor sandy soils. Nutrient enrichment either directly on site, or from external sources such as fertiliser drift, would encourage the growth of tall, coarse, competitive grasses such as cock's foot, at the expense of the host plant. As grazing is not practical at Tenby any cut vegetation should be removed from site.
- **Gross physical disturbance:** Gross physical disturbance (eg trampling and erosion through increased levels of recreational activity on both the sites) could lead to habitat degradation and damage to the flowering spikes. There is evidence to suggest that purple broomrape benefits from controlled soil disturbance, but excessive amounts leading to a decline in the host plant and to significant changes in soil structure and microclimate could threaten the species.
- **Herbicide use:** Herbicides are used on the edges of the Tenby site and could threaten the population.
- **Fragmentation of Suitable Habitat:** It is possible that the Manorbier site is a relic of a meta-population: the 2 former sites may have been

closely linked to the Manorbier site. Consideration should be given to restoring suitable habitat at the 2 former sites and to re-introduction of the species in the Stackpole National Nature Reserve. In good years consideration should be given to collecting seed to enable propagation of plants for re-introduction.

- **Climate (long-term) and weather (short-term):** The broomrape family as a whole tends to favour warmer, well drained sites. Global warming resulting in warmer, drier summers could benefit the species, whilst a series of cold, wet summers in the short-term may have a negative impact. The effects of climate and weather could be significant, given that this species has relatively few, widely scattered populations on the south and east coasts of England. Short term impacts of cold, wet summers could be mitigated by ensuring that the species range is restored (if possible) and that the quality of habitat is enhanced within its current range.
- **Host plant availability:** The availability of the host plant, yarrow, is important to the survival of purple broomrape. Yarrow is thought to have declined at the Manorbier site and may have been lost or reduced at other historical sites. Yarrow is capable of regeneration from fragments of rhizome and seed falling on disturbed ground readily germinates. In New Zealand yarrow is considered very drought tolerant and is known as "the bane of cereal farmers" due to the fact that it rapidly infests arable land there. As the grassland swards at the purple broomrape sites become more stabilised and closed, germination sites are reduced and soils become wetter and less suitable. A lack of disturbance also reduces the opportunities from rhizome fragmentation and distribution.

Related Plans and Policies and Further sources of Information

Other plans / policies directly affecting the management of these species in Pembrokeshire are:

- Coastal Habitat Action Plan. Available here: http://ukbars.defra.gov.uk/project/show/36391
- Grassland Habitat Action Plan. Available here: http://ukbars.defra.gov.uk/project/show/36385
- Freshwater East to Skrinkle Haven SSSI Management Statement. Available here: http://www.ccgc.gov.uk/landscape--wildlife/protecting-our-landscape/special-landscapes--sites/protected-landscape/sssis/sssi-sites/freshwater-east-cliffs.aspx
- Prajs, B. (2010) *Orobanche purpurea* on its newly discovered site near Zaton Dolna (NW Poland): the problem of protection of a threatened parasitic plant species. Biodiv. Res. Conserv. 17; 33-38.

Plan Aims

Aim	Deadline	Comments
No contraction in the current extent of the population at Tenby or Manorbier.	Ongoing	
Flowering spikes should appear in at least three out of every six years at known sites.	Ongoing	
The host plant, yarrow, should be liberally distributed throughout the known sites with a cover of 10% and a frequency of 80%.	Ongoing	

Suggested Action

Action	Report By	Lead Role	Progress / Additional Information
Monitoring: Annual census of flowering spikes.		BSBI	
Site management, to encourage the host plant and to improve the grassland habitat at the main sites in Tenby and Manorbier.			Undertaken Yarrow population reinforcement at key sites (re-seeding, scarification etc)
Site safeguard: achieved through statutory consultations with NRW, via the SSSI mechanism at Manorbier and directly with Pembrokeshire County Council who own/manage the Tenby site.			
Management of access for recreation, to minimise impact through disturbance (eg excessive trampling).			
Undertake trials to enhance Yarrow populations perhaps on a site without broomrape (to avoid damage); small scale			

Reviewed April 2015

ploughing, Harrowing, or Excavation.			
Small dead flower spike of broomrape found in grassland at Manorbier camp summer 2014. It was growing in a yarrow rich area but was too gone over for positive ID. This site needs re-cheking summer 2015.			
Consider habitat restoration and re-introduction at potential connectivity sites to re-establish the likely historic population where appropriate.			
Consider periodic shallow tillage with a cultivator or with another farm implement at Manorbier.			
Periodic clearance of blackthorn scrub and other woody and tall vegetation growth at Tenby where the grassy slope is vulnerable to invasion by scrub.			