

The use of ploughing, scarification and rotovation to manage perennial knawel *Scleranthus perennis prostratus* in the Brecklands of north Suffolk, England

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SUMMARY

The endemic subspecies of perennial knawel *Scleranthus perennis prostratus* is a declining plant found only in the Breckland area of eastern England. In a small 3 ha patch of heathland, in 1974 approximately 1,000 perennial knawel plants were recorded. Although numbers fell to very low levels, a combination and refinement of management techniques including periodic rotovation and ground scarification appears to be maintaining a reasonable perennial knawel population.

BACKGROUND

In the UK the endemic subspecies of perennial knawel *Scleranthus perennis* ssp. *prostratus* is found only in the Breckland area of East Anglia, eastern England. The Brecklands, one of the driest regions of Britain, cover 940 sq. km within the counties of Norfolk and Suffolk.

Perennial knawel is classified as 'endangered' and is given special protection under the Wildlife and Countryside Act 1981. It is a small woody herb flowering between June and September. It is a biennial or short-lived perennial of very short grassy heaths, compacted tracks and abandoned arable land, and is generally found on well-drained acidic (pH 4.9-6.8) sandy soil. It is a poor competitor, and requires open soil for seedling establishment.

Perennial knawel has never been a widespread and within its restricted range it has suffered a marked decline over the last 50 years for several reasons including: the increased use of herbicides and fertilisers; the destruction of field-margin refuges; the abandonment of marginal arable land and heathland; afforestation of former sites and potential sites for colonisation; deterioration of former and potential sites due to inappropriate grazing; and loss of sites to building developments. It is now restricted to the southern part of Breckland in north Suffolk, and has been extirpated from Norfolk (but has been recently reintroduced to one locality – Leonard 2006).

This case study describes habitat management for perennial knawel at an undisclosed locality in north Suffolk.

ACTION

Species Recovery Programme: All previous records and management work for perennial knawel *Scleranthus perennis prostratus* were collated in 1992 for the 1993 English Nature Species Recovery Programme. This included extinction records, past introduction sites and site pH data. All previously known sites, throughout Norfolk and Suffolk were identified and assessed. Of these sites, three were found to still support populations of perennial knawel. This case describes site management undertaken at one of these localities.

Study site: This site is a small patch of heathland, roughly 3 ha in area, where perennial knawel has been recorded since 1876. When regular monitoring began here in 1974, there were approximately 1,000 individual plants recorded.

Ground disturbance using ploughing, scarification and rotovation: The site has been managed since 1974 by disturbing the ground using a combination of ploughing, scarification and rotovation (see Fig. 1 & Table 1, for the timing of these management operations between 1974 and 2005) to try and maintain suitable habitat conditions for perennial knawel. There has been no livestock

grazing and no additional planting or seeding of perennial knawel at this locality.

CONSEQUENCES

Since the high of 1,000 in 1974, the number of perennial knawel plants dramatically fell to just three individuals in 1977. Between 1978 and 2004, the number fluctuated between one to 121 individuals. In 2005, the site was resurveyed and 234 individuals were recorded. (see Fig. 1 & Table 1 for population fluctuations between 1974 and 2005). Management practices (disturbing the ground using either scarification or rotovation) after 1995 resulted in increases in the population of perennial knawel. Continued refinement of habitat management methods is ongoing.

Conclusions: The present management strategy, particularly using scarification and rotovation, appears to be maintaining a reasonable population of perennial knawel plants, although the population has not been restored to the high levels recorded in 1974. Ensuring that the ground is suitably disturbed and thus suitably bare, is essential for successful germination of seeds and growth of seedlings. Monitoring at this site is ongoing.

Table 1. The management and number of perennial knawel plants at an undisclosed site in north Suffolk, 1977 to 2005.

Year	Number of individuals	Management activity
1974	1000	
1977	3	
1978-1983	3	two small areas ploughed
1991	1	
1992	7	
1994	27	
1995	11	ground scarification
1996	37	
1997	37	
1998	74	
1999	121	
2000	54	
2001	34	
2002		rotovation
2003	66	
2004		light rotovation
2005	234	

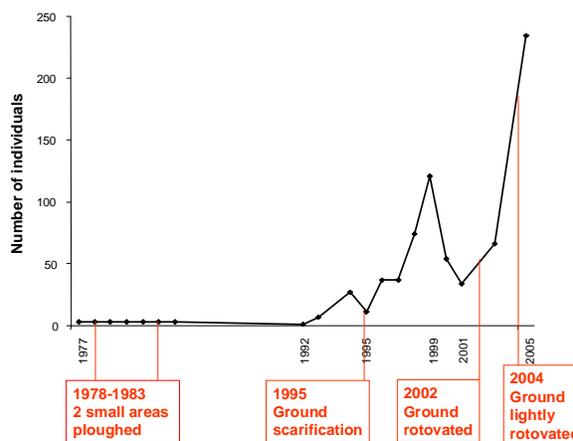


Figure 1. Management and number of perennial knawel plants at an undisclosed site in north Suffolk, 1977 to 2005 (Note: this graph excludes 1974 when approximately 1,000 plants were recorded).

REFERENCES

Leonard Y. (2006) Reintroduction of perennial knawel *Scleranthus perennis prostratus* to Thetford National Nature Reserve, Norfolk, England. *Conservation Evidence*, 3, 9-10.

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