

NORFOLK BIODIVERSITY ACTION PLAN

TOWER MUSTARD (*Arabis glabra*)

Tower mustard is a biennial or sometimes short-lived perennial member of the cabbage family which generally favours light, nutrient-poor sandy soils often over chalk or limestone. Plants germinate in spring, spending at least one season in a vegetative state before flowering the following May-June. Plants can produce abundant seeds, which are capable of remaining viable for many years; tower mustard plants often reappear on old sites after long periods of absence. As a mobile and opportunistic species, tower mustard was well matched to the traditional Breckland management cycle of extensive grazing with occasional arable cultivation.

Ref 2/S20	Tranche 2	Species Action Plan 20
Plan Author:	Norfolk Wildlife Trust	
Plan Co-ordinator:	Heathland BAP Topic Group	
Plan Leader:	Forestry Commission	
Date: Feb 2007	Stage: Final draft	

1. CURRENT STATUS

National Status

- Although tower mustard has been recorded from a total of 133 10km squares, this declined to 28 squares between 1987 and 1999 (Preston *et al*, 2002). According to Plantlife, the current area occupied by the species is only 15% of its total historic area. The most significant cause of decline has been agricultural intensification on heathlands.
- Extant sites occur within East Anglia (Breckland), the Midlands (Severn & Avon Vales) and southern England; west Norfolk is a particular stronghold. The species is widespread elsewhere in Europe, and is also found in western Asia.
- In Great Britain, tower mustard is now classified as *Endangered*. It receives general protection under the Wildlife and Countryside Act 1981.

Norfolk Status

- Almost confined to Breckland, tower mustard was found in 17 sites in Norfolk between 1988 and 1999. The majority of these sites are in forest rides, where the species can be abundant in some places. Forestry Commission records for the period 2000 to 2006, are given below:

Site	2000	2001	2002	2003	2004	2005	2006
Didlington Springs*			0	0	0	1	0
Stanton St/Harling Drove	79					155	118
Stanton St				1797	617	149	32
FR24							1
Barrow Hill					1		
4Score Plantation*			2	0	8		
Ickburgh*		400*					
Thetford-Danepak	17*						
Barnham Cross	157						
Harling Drove/Tunnel Track				26	10		
BromeHill Farm				0			

*Indicates ephemeral site.

- Tower mustard has been able to colonise some areas of newly created habitat in Breckland, such as clear-felled conifer plantations. It is possible that the species may actually be increasing in numbers on some existing sites in Breckland where appropriate management is taking place. New and often ephemeral sites are frequently being discovered in forested areas due to translocation of tower mustard seed by forestry equipment.
- Despite the implementation of appropriate management at Maine Road, the population of tower mustard at this site is in decline.

2. CURRENT FACTORS CAUSING LOSS OR DECLINE IN NORFOLK

- Habitat destruction as a result of agricultural intensification and building development. The former would appear to be the main reason for the decline of this species in recent years. However, the colonisation of a few newly created sites in Breckland has helped to slow the overall decline of the species.
- Habitat neglect, which results in a lack of open ground for regeneration and the development of coarse competing vegetation.
- Overgrazing by rabbits, stock and deer. Although tower mustard is a Breckland species, there is evidence that it is susceptible to high levels of grazing.

3. CURRENT ACTION IN NORFOLK

- The majority of sites are owned, managed and monitored by the British Trust for Ornithology, Plantlife or the Forestry Commission, and appropriate management is undertaken on all key (not ephemeral) sites where tower mustard occurs.
- On sites that are not owned by the above mentioned organisations (e.g., Barnhamcross Common, Seven Hills, Brettenham and Maine Road/Brandon Road sites), landowners are advised on appropriate land management for tower mustard.
- The Brandon Road site has been designated as a Roadside Nature Reserve.
- The Maine Road site is managed by the developer in conjunction with the Brecks Countryside Project, but has declined and further management is required.
- Plantlife is currently carrying out an ecological study of tower mustard at Ickburgh. This includes experiments to investigate the response of tower mustard to various cultivation techniques. PhD student Jo Nightingale from the University of Sussex is studying the ecology and population dynamics of tower mustard from sites in Breckland.
- The identification of new and often ephemeral sites continues; these are frequently being discovered in forested areas due to translocation of tower mustard seed by forestry equipment.

4. ACTION PLAN OBJECTIVES AND TARGETS

National

- Maintain the current (natural) range within twenty-six 10km squares.
- Establish populations at three sites within the historic range by 2010.
- Establish four meta-populations within the species current range by 2010.

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- As a minimum threshold, maintain the natural range of this species at or above 14 tetrads.
- Establish populations at two new sites within the species' historic range by 2010.

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
5.1	Policy and Legislation			
5.1.1	Ensure that the needs of this species are considered during reviews of the Breckland ESA Scheme.	Ensure that the needs of this species are considered during reviews of the Environmental Stewardship scheme.	NE	
5.2	Site Safeguard and Management			
5.2.1	Consider notifying as SSSIs sites holding key populations of tower mustard.	Notify further SSSI sites if appropriate.	NE	
		Consider designation of County Wildlife Sites and Roadside Nature Reserves, as appropriate.	NCC, NWT	
5.2.2	Where possible, ensure that heathland localities of tower mustard receive management that is beneficial to its conservation, eg through management agreements on SSSIs, Countryside Stewardship or the Breckland ESA Scheme.	Apply appropriate measures to ensure conservation of the species and suitable management.	NE	
5.2.3	Maintain suitable conditions for viable roadside and plantation ride populations.	Enhance the management of the Maine Road site.	Brecks Countryside Project	Developers
		Monitor conditions at the Brandon Road RNR to ensure that these are suitable for tower mustard.	NCC, NWT	
5.2.4	Ensure maintenance of suitable areas of habitat for this species within managed forests and woodlands in its range.	Undertake appropriate management of the species' sites within managed forests and woodlands.	Plantlife, BTO, FC	

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
5.3	Species Management and Protection			
5.3.1	Undertake trial management at five suitable historic sites with the aim of regenerating this species from the seed-bank. Management is likely to include scrub clearance, coppicing and ground disturbance.	Identify any sites where tower mustard was historically recorded or seems likely to have occurred in the past. On appropriate sites, carry out management to encourage regeneration of the species from the seed bank.	Norfolk Flora Group FC, NCC	
5.3.2	Assess the feasibility and desirability of reintroducing tower mustard at selected sites should regeneration from the seed-bank prove unsuccessful.	Assess the feasibility and desirability of reintroducing tower mustard at selected sites should regeneration from the seed-bank prove unsuccessful.	FC, NCC, Norfolk Flora Group	Plantlife
5.3.3	Ensure the development of an <i>ex-situ</i> conservation programme. Seed should be collected from a representative number of sites in different parts of the range of this species and deposited in the Millennium Seed Bank at Wakehurst Place (Kew). Plants should also be propagated for reintroductions if necessary.	Collect seed samples from key sites in Norfolk and deposit at the Millennium Seed Bank.	Norfolk Flora Group, FC	Royal Botanic Gardens, Kew
5.4	Advisory			
5.4.1	Advise relevant landowners and managers of the presence and importance of this species and appropriate management for its conservation.	Raise the profile of tower mustard where possible, with the aim of improving awareness of landowners and the general public about the vulnerability, status and management needs of this species.	NCC, FC, NWT, NE	

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
5.4.2	As far as possible, ensure that relevant agri-environment project officers are advised of locations for this species, its importance and management for its conservation. This is particularly important for the Breckland ESA.	Ensure Natural England is aware of status, management needs and locations of all sites where the species occurs in Norfolk.	NWT, Norfolk Flora Group, NE	
5.4.3	Advise those people working in the vicinity of extant sites for this species of its importance and steps which could be taken to encourage natural colonisation of their plantations.	Ensure landowners inform relevant workers about the presence of extant sites and appropriate management to encourage tower mustard.	FC, NCC NWT, NE	
5.5	Future Research and Monitoring			
5.5.1	Complete a national survey of extant and historic sites, identify the main threats at each and assess the ecological requirements of the plant.	Distribute the findings from the Ickburgh autecology study. Encourage information from the University of Sussex study to be shared with the Biodiversity Partnership. Ensure on-going monitoring of tower mustard sites in Norfolk.	Plantlife, FC, Norfolk Flora Group Heathland BAP Topic Group, FC NE, FC, Norfolk Flora Group	University of Sussex
5.6	Communications and Publicity			
5.6.1	Raise awareness of the conservation value of arable and intermittently disturbed, open habitats particularly within the range of this species. This publicity should be targeted at farmers and the general public.	Promote the conservation value of arable and intermittently disturbed, open habitats particularly within the range of this species, to landowners and public.	FWAG, NE	

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NATIONAL ACTION		NORFOLK ACTION	ACTION BY:	PARTNERS:
5.7	Links with Other Action Plans			
5.7.1	It is likely that implementation of this action plan will benefit <i>Bromus interruptus</i> and <i>Scleranthus perennis</i> spp <i>prostratus</i> .	Implementation of this plan may benefit <i>Scleranthus perennis</i> , which has been reintroduced to a few sites in Breckland.	Heathland BAP Topic Group	

Abbreviations

BTO	British Trust for Ornithology
FC	Forestry Commission
FWAG	Farming and Wildlife Advisory Group
NBRC	Norfolk Biological Records Centre
NCC	Norfolk County Council
NE	Natural England
NWT	Norfolk Wildlife Trust

NORFOLK DISTRIBUTION

MANAGEMENT GUIDANCE

(This guidance is a general summary; for more detailed information or advice, please consult the references or contacts below.)

Arabis glabra requires sandy soils that are prone to drought, where vegetation cover is slow to develop. Soils should be disturbed occasionally to uncover buried seed and expose bare soil.

It is important that soils not be disturbed too frequently in order to prevent the destruction of germinated seedlings. Disturbance should not be carried out during the flowering and seeding period. Ideally, no more than a half of a site should be disturbed each year, between December and February.

Vegetation should not be cut too early as the seeds of *Arabis glabra* are retained into the winter. Ideally, tower mustard sites should be cut annually between January and February and cuttings should be removed.

Major disturbance, using disc cultivation and bulldozers as management tools, has proved successful as well as intensive control of vegetation and large-scale scrub clearance. Any grazing of sites as a vegetation control should be extensive. Sites should not be intensively sheep grazed.

The episodic appearance at traditional sites, plus observations of other plant species associated with disturbed ground in Breckland, suggest long term viability of local populations depends on re-charging persistent seed banks to a high density. As this is a paucennial or biennial, seedbank re-charge will require a number of years to achieve following seedling establishment. As management depends on creating suitable disturbed and early successional conditions, but using only intermittent soil disturbance, it is therefore important that competition remains minimal for some time following physical disturbance. For this reason, attention should be given to reducing or minimising soil nutrient content, e.g. through removal of biomass, litter and or humus (while not damaging seedbanks).

REFERENCES

Plantlife and Wilson, P. (2002, revised 2004). Species Dossier: *Arabis glabra*.

http://www.plantlife.org.uk/uk/assets/saving-species/saving-species-dossier/Arabis_glabra_dossier.pdf.

Preston, C.D., Pearman, D.A. and Dines, T.D. (2002). *New Atlas of the British and Irish Flora*. Oxford: University Press.

Wheeler, B.R. (2000). Tower mustard (*Arabis glabra*). Report on work undertaken during 1999. Plantlife Report No. 45. London: Plantlife.

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