

Creating ponds for Three-lobed Water- crowfoot *Ranunculus* *tripartitus*



Freshwater Habitats Trust

A 50-YEAR PROJECT TO CREATE A NETWORK OF CLEAN WATER PONDS FOR FRESHWATER WILDLIFE

1. Three-lobed Water-crowfoot

Three-lobed Water-crowfoot *Ranunculus tripartitus* is a small winter annual with white flowers typical of the water-crowfoots (Figure 1). It grows in shallow water and on the wet mud of small temporary pools and is so well adapted to the ephemeral nature of its habitat that it flowers earlier in the year than other crowfoots (from February to May), before its muddy pools dry up.

Three-lobed Water-crowfoot is found in the lowland acid grasslands and heathlands of south-east and south-west England, south-west Wales and Anglesey (Figure 2). It has declined across much of its range due to loss of heathland habitat, loss of seasonal pools, and cessation of grazing. In the south-east it is suspected that several populations have interbred with Round-leaved Crowfoot to create the hybrid *R. x novae-forestae*, however this variant is still rare and should still be managed along similar guidelines. Three-lobed Water-crowfoot is classified as Endangered and faces a high risk of extinction in the wild.

The potential clearly exists to create habitat for this species and reverse its decline. There was significant loss of the species within Pembrokeshire in the middle of the 20th century due to a decline in grazing and the termination of clay extraction in the region. However, heathland restoration has recently led to a dramatic recovery.



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Figure 1. Three-lobed Water-crowfoot growing in a temporary pond in grazed heathland during both wet and dry phases.

2. Habitat requirements

This species inhabits shallow grassy heathland pools that are dry in summer and become flooded during the winter. In south-east England, it has also been found in pools within rides in coppiced woodland. It is intolerant of competition from other plants, so is most successful in open pools with fluctuating water level where there is additional disturbance either by cattle poaching or vehicles.

Key messages

- **Locate ponds adjacent to existing or historical Three-lobed Water-crowfoot sites.**
- **Create shallow ponds with edges, less than 30cm for at least 1m.**
- **Ensure fluctuating water levels to reduce the cover of terrestrial and aquatic plants.**
- **Maintain open habitats by grazing with cattle or ponies. Compaction by their hooves will help to retain standing water in winter.**
- **Maximise grazing pressure by locating ponds in pinch-points.**
- **Remove invasive non-native plants as soon as they occur. Once established they are very difficult to remove effectively.**

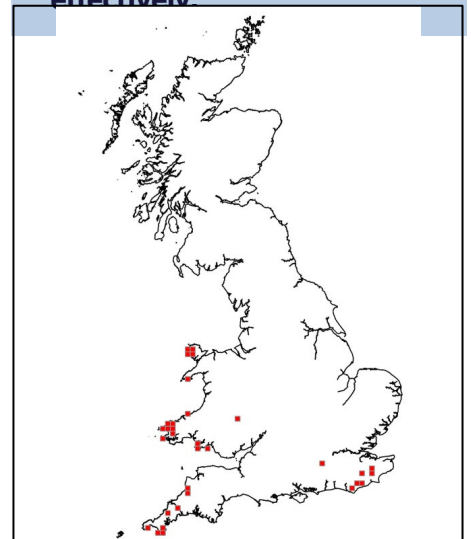


Figure 2. Current distribution of Three-lobed Water-crowfoot in the UK.

Data provided by the BSBI

3. Pond creation for Three-lobed Water-crowfoot

The seeds of Three-lobed Water-crowfoot are thought to remain viable for over 50 years. It has a remarkable ability to 'reappear' from seed buried in the mud of overgrown pools. So it is still worth carrying out pond creation or management for the species a long time after the last records of its occurrence.

Experimental work at Hothfield Common by Kent Wildlife Trust showed that with grazing, plants colonised newly created ponds immediately adjacent to existing populations very easily.

Locating ponds

Three-lobed Water-crowfoot is found in acid grasslands on sandy soils usually within a heathland mosaic. Many conservation projects seek to restore this habitat type, particularly following forestry and aggregate operations. Consider pond creation for Three-lobed Water-crowfoot as part of the restoration scheme, particularly in sites with historical records for this species. The species is particularly likely to spread to new ponds if created within the same grazing unit as existing populations.

Three-lobed Water-crowfoot has also been recorded from woodland ponds. It requires bare mineral soils (clay or sand) and does not do well when there is a build up of organic sediments, such as leaf litter. Therefore in woodland habitats it tends to occur along woodland rides or adjacent to gateways where animal and vehicle traffic exert heavy pressure. The advantage of woodland habitats may be that the shelter created by trees allows temporary ponds to hold water for longer.

Ponds for Three-lobed Water-crowfoot will be surface water fed. If you're not sure which ponds will hold water, go for small pools and puddles which are simple and cheap to make. If they don't hold water these hollows will add to the micro-topography of the site. Be prepared to be flexible and change design plans as needed (see [Supplementary Habitat Factsheet: Heathland ponds](#) for more information).

Trampling, particularly in trackways, creates compaction which will retain surface water during the winter months. Identify areas where this pressure is likely to be greatest, e.g. at pinch points in gateways, where the surrounding vegetation funnels stock into one area or where a number of paths meet.

Manage ponds with moderate/heavy grazing. Three-lobed Water-crowfoot needs a very short (<5cm), poached sward (more than 50% bare ground). Pond creation for Three-lobed Water-crowfoot will be most successful if there is livestock grazing and poaching. If this is not viable, ponds should be located where occasional vehicle access is possible to create heavy rutting each summer (Figure 3).

Avoid sensitive areas. It is very important that new pond creation does not damage habitats with existing biodiversity value. Opportunities for pond creation exist where trackways are reinstated in heaths and woodlands, as part of habitat restoration schemes and in uniform stands of vegetation with little existing biodiversity value.



Figure 3. Ideal habitat for Three-lobed Water-crowfoot – the pond on the left is a small, shallow temporary pool; the pond on the right is a pool which has formed in the ruts of a trackway.



Pond shape, depth and size

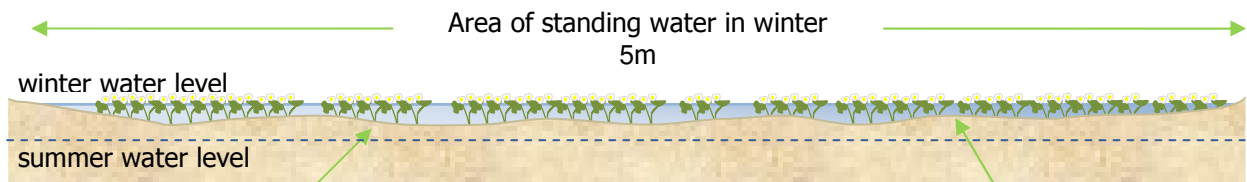
Three-lobed Water-crowfoot is a temporary pond specialist, surviving in ponds which hold water for at least 6 months of the year. These pools typically have little other vegetation because of the heavy level of grazing and/or disturbance from poaching that they receive. Three-lobed Water-crowfoot needs this level of disturbance because it is very poor at competing with other plants, either terrestrial or aquatic species. Encouraging bare muddy conditions is most easily achieved in small shallow ponds, with a broad drawdown zone which reveals bare wet mud slowly through the spring and early summer.

Figure 4. Pond profiles for Three-lobed Water-crowfoot

Option 1: Pond design is broad and shallow

Create shallow untidy scrapes where animal poaching or vehicle traffic is likely to be high.

Don't be too neat. The micro-topography (bumps and lumps) within the pond will create ideal habitat for Three-lobed Water-crowfoot.



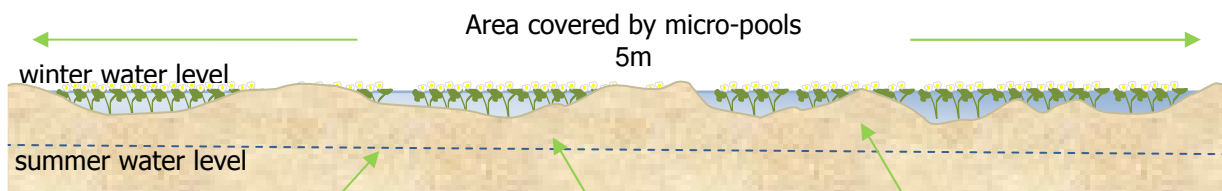
Dry in summer, wet in winter. Three-lobed Water-crowfoot grows in the winter months when the pond is holding water.

Maximum water depth 10-40cm. Creating a range of different depths will increase the chance of the pond holding water into late spring in order for Three-lobed Water-crowfoot to germinate.

Option 2: Micro-pools

Create lots of small pools where space is limited and in areas where the water holding capacity of the site is uncertain.

As above try not to be too tidy, the more irregular the profile the better. Poaching by animals will add to the profile.



Five or six small pools created in areas where animal traffic is concentrated.

Dry in summer, wet in winter. Three-lobed Water-crowfoot grows in the winter months when the pond is holding water.

Create a variety of pond depths between 10-40cm.

Optimum pond designs will include a mixture of both of the above in a complex of ponds. This will maximize the availability of suitable habitat for Three-lobed Water-crowfoot and allow it to move around the site as conditions become suitable.

4. Management for Three-lobed Water-crowfoot

Temporary ponds which are kept open by heavy grazing and disturbance are very stable habitats which will reappear in the same location for many years. Populations of Three-lobed Water-crowfoot will be self-sustaining in these habitats and need little additional management (Figure 5).

Where grazing is not a viable option, heavy rutting by vehicle traffic can be used to create similar levels of disturbance. In these sites additional management will be required to control scrub and shading by trees.

Three-lobed Water-crowfoot germinates in the autumn when the autumn rains first fill the pond. It then grows during the winter and flowers in late spring coinciding with the pond drying out for summer. A reduction in the intensity of grazing during late spring will be beneficial to avoid the flowering season. In August and September the ground should be heavily poached to trigger germination as the pond fills.

All temporary pond species which occupy bare ground in the drawdown zone are vulnerable to invasion by non-native plant species. Monitor sites for species such as New Zealand Pigmyweed *Crassula helmsii* and remove as soon as they are identified. Once established they are difficult and costly to remove.



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Figure 5. Heavy winter poaching adjacent to this gateway – a pinch point for animal and vehicle traffic - has created a seasonal pond, providing ideal habitat for Three-lobed Water-crowfoot.

4. Further reading

Gimingham, CH. (1992) *The Lowland Heath Management Handbook*. English Nature, Peterborough.

Williams, P., Biggs, J. Fox, G., Nicolet, P. and Whitfield, M. (2001) *History, origins and importance of temporary ponds*. *Freshwater Forum*, 17, pp. 7-15.

Stewart A., Pearman DA. and Preston CD. (1994) *Scarce plants in Britain*. JNCC, Peterborough.

For further information about the Million Ponds Project and to consult other factsheets in the Pond Creation Toolkit, please visit

www.freshwaterhabitats.org.uk or email enquiries to info@freshwaterhabitats.org.uk

