

Creating ponds for Pigmy Rush *Juncus pygmaeus*



Freshwater Habitats Trust

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

1. Why create ponds for Pigmy Rush?

Pigmy Rush *Juncus pygmaeus* is a tiny annual plant, just 8cm tall (maximum) but often much smaller (Figure 1). Individual plants have few leaves, small compact flower heads and can be easily overlooked even by the experienced surveyor. Compared to other small rushes it has a reddish/salmon colour which is highly distinctive when many plants are discovered growing together. Pigmy Rush is only found on serpentine and gabbro heaths, where seasonally wet pools within trackway ruts and repeated disturbance create the bare ground it depends on for its survival.

Pigmy Rush has always been rare nationally and has only ever been recorded from the Lizard Peninsula (Figure 2). Changes in landuse in this area have made it one of the UKs most threatened plants. The cessation of grazing, declines in the use of ancient trackways and "improvements" to the track network through infilling have all resulted in habitat loss for this species. Historically it was recorded from 20 sites, but has only been found at half of these in recent years. Pigmy Rush is classified as Endangered and protected under Sch. 8 of the Wildlife and Countryside Act.



Figure 1. Smallest of the small! Pigmy Rush is hard to find even when growing in the sparsely vegetated habitat it needs.

2. Habitat requirements

Pigmy Rush mainly grows in nutrient poor, seasonally flooded trackways within wind-blown loess soils that overlay the serpentine and (more rarely) gabbro bedrock. Typically such trackways cross areas of short grassy heathland. Its survival is dependent upon repeated heavy disturbance from both animals and vehicles.

Deeply rutted trackways fill with water in autumn and dry out in spring and early summer – germination occurs as the trackways dry out. In this habitat, it is associated with other rare specialists including, Yellow Centaury *Cicendia filiformis*, Pillwort *Pilularia globulifera*, Three-lobed Water-crowfoot *Ranunculus tripartitus* and Strawberry Stonewort *Chara fragifera*.

Key messages

- **Locate ponds adjacent to existing or historical Pigmy Rush sites. It will readily spread within a site wherever there are suitable conditions.**
- **Create a complex of shallow micro-pools less than 1m², max. 20cm deep, to cover an area at least 5m².**
- **Three factors are essential for its survival;**
 - winter wet habitats,**
 - heavy levels of disturbance,**
 - mildly acidic soils.**
- **Remove invasive species as soon as they occur. Once established they are very difficult to remove**



Figure 2. Current distribution of Pigmy Rush in the UK

3. Pond creation for Pigmy Rush

Populations of Pigmy Rush can reach very high numbers – with a record 40,000 plants being recorded from one trackway system. Very rarely populations today reach over a thousand plants, but most are much smaller. Populations appear irregularly at best – depending on both natural variation in weather conditions (particularly spring droughts that dry out the trackways too rapidly) and levels of track usage.

The temporary pond habitats of Pigmy Rush are often overlooked or ‘tidied up’ to provide easier access to the countryside for walkers, cyclists and horse riders. In addition, key sites on the Lizard Downs, the Penhale Track and elsewhere, have been largely or wholly destroyed through infilling with rubble to provide all-weather surfaces for vehicle access.

A few simple steps can create very successful new habitat for Pigmy Rush, by both supporting existing populations and by creating new ponds adjacent to lost populations. Pigmy Rush will readily move between pools, following creation of suitable conditions, and the greater the area of good habitat the greater the number of plants that will germinate.

Seed has also been collected and is being stored at the Millennium Seed Bank, Kew, to safeguard the population and this could potentially be used to provide a source of seed for reintroduction. But this should be unnecessary in view of the fact that the species can remain as buried dormant seed for decades.

Locating ponds

Within the Lizard Peninsula there are many opportunities for pond creation for Pigmy Rush. Any of the sites with historical or recent records will benefit from pond creation. But, there are a few key location requirements which will increase the suitability of ponds.

- Where the stabilisation and infilling of tracks has led to the destruction of pools for Pigmy Rush, create thin linear pools alongside the track. Where grazing management is present on site, these will be sufficiently poached to support new populations of Pigmy Rush.
- Avoid areas adjacent to arable fields. Pigmy Rush needs oligotrophic (low nutrient) water. It can withstand relatively high inputs of animal dung, but uncontrolled nutrient input will lead to eutrophication and a decline in habitat quality.
- Ponds will be filled with surface water during winter rainfall. If you’re not sure which ponds will hold water, go for small pools 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.
- Locate ponds to maximise disturbance during the winter months. This will create bare ground and compaction which will retain surface water. Evidence suggests that the best sites are where old, completely overgrown trackways are re-used by heavy vehicles. In some cases it may be necessary to re-dig out the trackways. Identify areas where grazing 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 (Figure 3).

Avoiding sensitive areas

It is very important that new pond creation does not damage habitats with existing biodiversity value. War time aerial photographs of the Lizard show it criss-crossed with ancient lost trackways – these are often only just visible on the ground and should be the first place to create rutted pools for Pigmy Rush.



Pond shape, depth and size

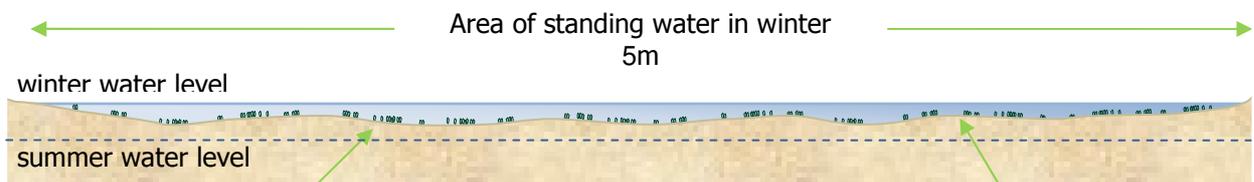
Pigmy Rush is an annual plant which is found growing on bare ground in the drawdown zone of shallow, heavily poached pools during the summer months (Figure 3). Inundation should be sufficiently long to prevent terrestrial grasses from becoming established (i.e. water should stand through winter and early spring), but in most years ponds should dry out completely during the summer.

Figure 3. Pond profiles for Pigmy Rush

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 Pigmy Rush.



Dry in summer, wet in winter. Pigmy Rush grows on the bare mud revealed after water levels recede.

Option 2: Micro-pools/Rutting in trackways

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 of six small pools created in areas where animal and vehicle traffic is concentrated.

Dry in summer, wet in winter. Pigmy Rush grows on bare mud revealed after water levels recede.

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 Pigmy Rush and allow it to move around the site as conditions become suitable.

4. Management for Pigmy Rush

Active management is already underway to protect and restore some populations of Pigmy Rush on the Lizard. The key to its survival is ensuring the optimal level of grazing and allowing ruts and pools to develop along trackways.

- Landowners are being encouraged to continue managing their tracks and gateways to support species such as Pigmy Rush. Funding for grazing is currently available through the Higher Level Agri-environment Scheme.
- Scrub management may be required where a site has become overgrown, but some scrub can be useful in channelling grazing stock towards pinch points i.e. where trampling pressure is concentrated.
- Where grazing management is not a viable option, vehicle traffic can be used to create similar levels of disturbance. However significant management or disturbance is usually needed at least every 5 years to keep pools sufficiently open.
- Ideally a combination of both grazing and vehicle traffic are needed - grazing to keep heathland vegetation short, with vehicle rutting to revitalise the small pondlets.

5. A brighter future?

Pigmy Rush habitat has been successfully restored at Ruan Pool and adjacent trackways at Windmill Farm Nature Reserve (Figure 4), by creating small pools, reinstating irregular rutted trackways and grazing management. This project, a collaboration between Cornwall Wildlife Trust, who own the site, Cornwall Bird Watching and Preservation Society (CBWPS) and Plantlife, has resulted in the reappearance of several nationally rare species, including Pigmy Rush, Pillwort and Three-lobed Water-crowfoot.

Grazing with Dexter cattle has been restored to Predannack Airfield (MOD) and plans are in progress to graze Kynance and the Lizard Downs (National Trust) for Pigmy Rush and other rare annuals.



Figure 4. Grazing of trackways adjacent to Ruan pool has led to the creation of heavily poached temporary pools for Pigmy rush.

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6. Further reading

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

