

Creating ponds for the Zircon Reed Beetle *Donacia aquatica*



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

1. A jewel in the reeds

The Zircon Reed Beetle *Donacia aquatica* is a distinctive animal. Like all reed beetles it has a long body and equally long antennae, hairy underside and metallic elytra. The Zircon Reed Beetle is between 6.8-6.9mm in length; the males are smaller than the females. The elytra have a broad longitudinal band of rainbow colours from green through to purple, with a central gold strip (Figure 1). The legs, thorax and hairy underside are also gold.

This is the most threatened *Donacia* in Britain having been lost from 81% of previously occupied 10km squares. Since 2000 it has been recorded from just 7 sites; two in Sussex, two Suffolk, two in Norfolk and one in the Lake District.



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Figure 1. The Zircon Reed Beetle is striking, but there are similar, rather less showy reed beetles that are common. Take a photograph of the living animal and get the identification checked by an expert.

2. Key habitat requirements

- **Wetland habitat adjacent to a large pond.** The Zircon Reed Beetle is found away from the pond in the surrounding fen or marsh, but like all reed beetles the larvae, pupae and cocooned adults are all aquatic therefore it is dependent on pond habitat within a few metres of its terrestrial habitat.
- **Food plants.** The Zircon Reed Beetle is most often found amongst patches of Lesser Pond Sedge *Carex acutiformis*, Bottle Sedge *C. rostrata* and Bladder Sedge *C. vesicaria*. It has also been found with Lesser Tussock Sedge *C. diandra*, Slender Tufted-sedge *C. acuta* and Greater Spearwort *Ranunculus lingua*. But it seems to avoid stands of Greater Pond Sedge *C. riparia*.
- **Grazing management.** The Zircon Reed Beetle overwinters inside the submerged part of the plants on which it feeds; therefore care is needed during management. Marginal scrub control is important at some sites, but should be limited to late summer.

Key messages

- **Ideally create new wetland pond complexes within the historic distribution of the Zircon Reed Beetle.**
- **Locate ponds away from intensive landuse areas to allow diverse fen and marsh habitats to develop adjacent to the pond. Zircon Reed Beetles are dependent on the presence of sedge habitat.**
- **Create a complex of ponds including large waterbodies to create a diverse wetland, to support species including Zircon Reed Beetle.**
- **Ensure that ponds have very broad, shallow margins, inundated by water even at low summer water levels, to support a band of dense marginal sedge vegetation.**
- **Manage sites by light grazing on a rotational basis to create a diverse sward, free from woody scrub. Additional manual scrub control may also be required.**

3. What do we know about the Zircon Reed Beetle

Why it has declined

The Zircon Reed Beetle was formerly known from at least 77 locations in England and two in Wales. Its catastrophic decline to just 7 sites has been attributed to loss of habitat from drainage, water abstraction and infilling of lakes and ponds. It has also suffered from changes to the quality of sites, due to encroachment tall emergent plants including Common Reed *Phragmites australis* and Bulrush *Typha latifolia* and sedimentation from agricultural run-off.

To see the current and historical distribution of the Zircon Reed Beetle visit the [BAP Species Map](#).

Why will creating new ponds help?

Current conservation action is focussed on maintaining the Zircon Reed Beetle at existing sites through appropriate habitat management and gaining a better understanding of its ecological requirements. Beyond this, there is a need to restore populations to within its former range.

The Zircon Reed Beetle is dependent on ponds with adjacent wetland habitats (Figure 2). The aggregates industry has an important role to play in delivering habitat creation targets for this species because aggregate extraction sites are one of the few extensive areas, outside nature reserves, where it is possible to easily create clean water ponds.

4. Pond designs for Zircon Reed Beetle

Pond location and finding a clean water source

The dispersal capabilities of the Zircon Reed Beetle are not fully known. However, it is capable of flight and will readily take to the wing if disturbed. The adults are active in May and June, somewhat before other reed beetles. It may be capable of moving to suitable habitat on its own, but it is more likely that translocation of individuals will be required.

Opportunities to create new ponds within existing sites may be limited without damaging areas with existing high biodiversity value. Look for opportunities to create new pond habitat adjacent to existing sites and within the historic range, provided the following criteria are met:

- **Clean water habitats.** Sites must provide the pond with an unpolluted water source. Ensure that there is no arable or other land adjacent to the pond where the ground is regularly disturbed or where it is likely to be high in nutrients. Avoid intensive grassland where fertilisers or pesticides could drain into the pond. Avoid places likely to receive polluted run-off from roads, tracks, houses or spoil heaps.
- **Groundwater-fed ponds.** Ponds should be fed from groundwater as these are more likely to be permanent than surface water fed ponds. Water should filter through limestone or chalk to provide water with an alkaline pH.



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Figure 2. The all important strip of *Carex* spp. which is essential for Zircon Reed Beetles. This band of marginal vegetation may be threatened by scrub encroachment (right).

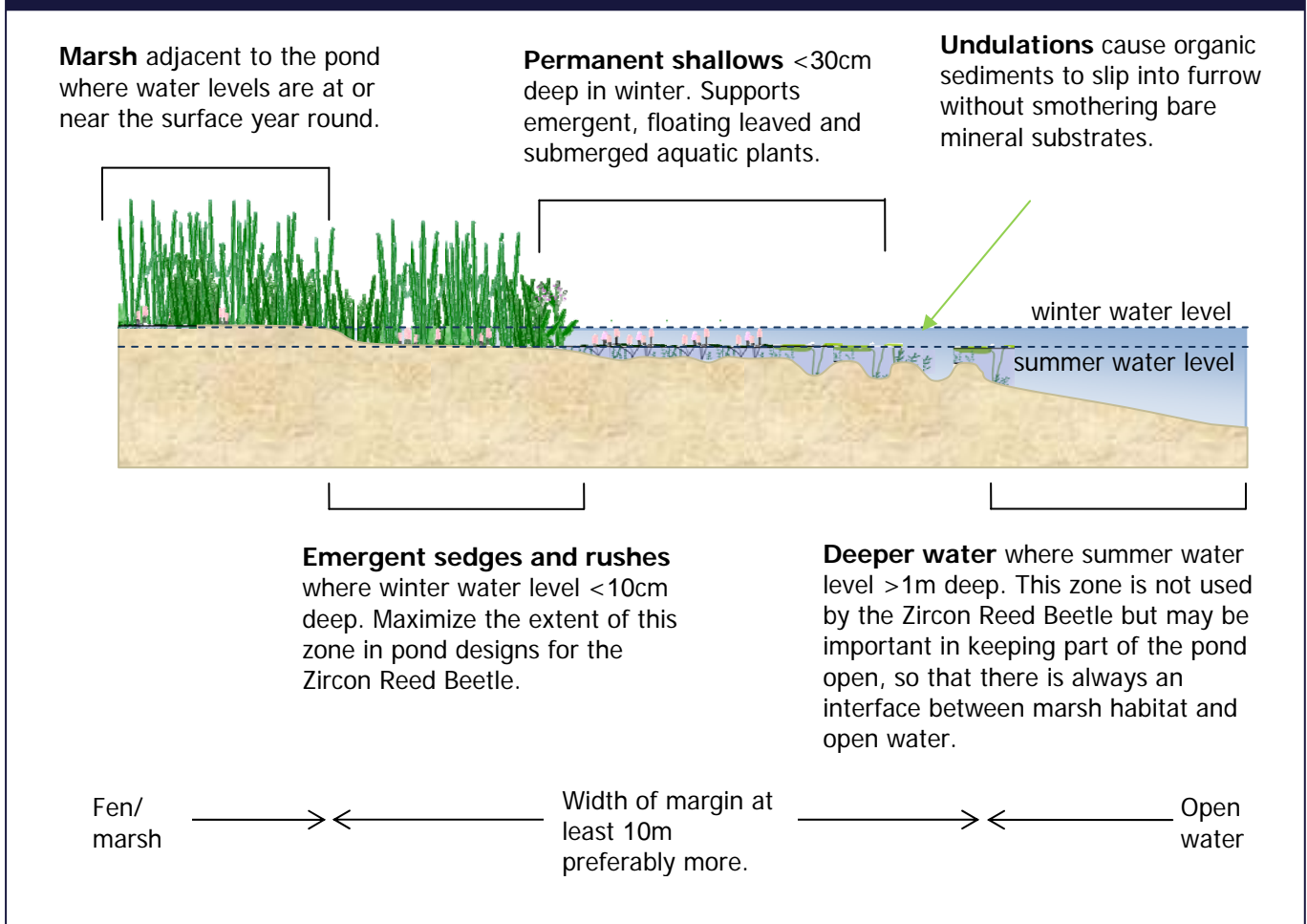


Pond designs

It is difficult to be prescriptive about the exact designs of ponds suitable for the Zircon Reed Beetle because we do not have enough information on its ecological requirements. However, the ponds where it currently occurs have certain characteristics in common, these include:

- **A broad, shallow margin.** To support an extensive area (5-10m wide) of marginal sedges but also submerged and floating leaved plants. Adults live on emergent vegetation close to open water, whilst the eggs have been found on the underside of floating leaves. Water depth should be less than 10cm and whilst water levels may fluctuate, water should remain just below ground level for most of the year (Figure 3). This species is associated with floating rafts of vegetation that (presumably) provide host plants for both the larvae and the adults.
- **Build up of natural organic sediments.** The larvae are fully aquatic and have been found in organic sediment on the bottom of the pond attached to the roots of plants where they can breathe air through channels in the plants. Organic sediments will build up slowly over time and do not need to be added to the pond. Many plants (e.g. stoneworts) prefer bare mineral substrates so provide a range of habitat types by creating undulations in the pond margin. Organic sediments will build up in the furrows and leave the ridges bare (see the [Stoneworts Species Dossier](#) for more information).
- **Large, deep ponds.** Although the margins of ponds should be shallow, the ponds which seem to support the Zircon Reed Beetle are large (>1ha) with a maximum depth 1.5-2m deep. This may afford them some stability against fluctuating water levels and may prevent the whole pond from being dominated by tall emergent plants.

Figure 3. Pond designs for the Zircon Reed Beetle



Management for the Zircon Reed Beetle

- **Grazing management.** The Zircon Reed Beetle overwinters inside the submerged part of the plants on which it feeds; therefore care is needed during management. Too much grazing and the plants will be damaged; too little grazing and woody scrub will dominate. Therefore sites should be managed by light grazing with cattle or horses, preferably on a rotational basis and not the whole site in any one rotation.
- **Marginal scrub control** is important at some sites, but should be limited to late summer. This will prevent pond margins from becoming shaded and encourage growth of marginal plants.
- **Liaison with adjacent landowners.** Threats to the Zircon Reed Beetle include sedimentation from agricultural run-off and lowered water levels as a result of water abstraction. Stakeholders will need to agree on both management within the site and management of adjacent land in order to maintain conditions suitable for the Zircon Reed Beetle.
- **Visitor management.** Large bodies of water often attract visitors. The Zircon Reed Beetle appears to be sensitive to disturbance and therefore may be negatively impacted even by walking close to the sites where it occurs. Other activities such as fishing, feeding ducks and disturbance of the sediments by dogs swimming in the pond may be even more damaging (see [Supplementary Advice Factsheet: Creating ponds in areas of public access](#) for more information). Ponds created for the Zircon Reed Beetle are best located away from areas with public access or zoned to provide undisturbed margins.

5. Further reading

Foster, GN., Bratton, JH., Ewing, AW., Hodge, PJ. and Nobes, G. (2007). Current status of *Donacia aquatica* L. (Chrysomelidae) in Britain and Ireland. *Coleopterist* 16: 25-34.

Foster, GN. and Nelson, B. (2010). Some recent records of Donaciinae in Britain and Ireland. *The Coleopterist* 19(1): 15-19.

Menzies, IS. and Cox, ML. (1996) Notes on the natural history, distribution and identification of British reed beetles. *British Entomology and Natural History* 9, 137-162.

Nelson, B. (2007) Finding jewels amongst the reeds: a review of the Irish Donaciine beetles (Coleoptera:Chrysomelidae).

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

www.freshwaterhabitats.org.uk/projects/million-ponds

or email enquiries to info@freshwaterhabitats.org.uk



This factsheet was prepared with the advice and expertise of Prof. Garth Foster, The Aquatic Coleoptera Conservation Trust.

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