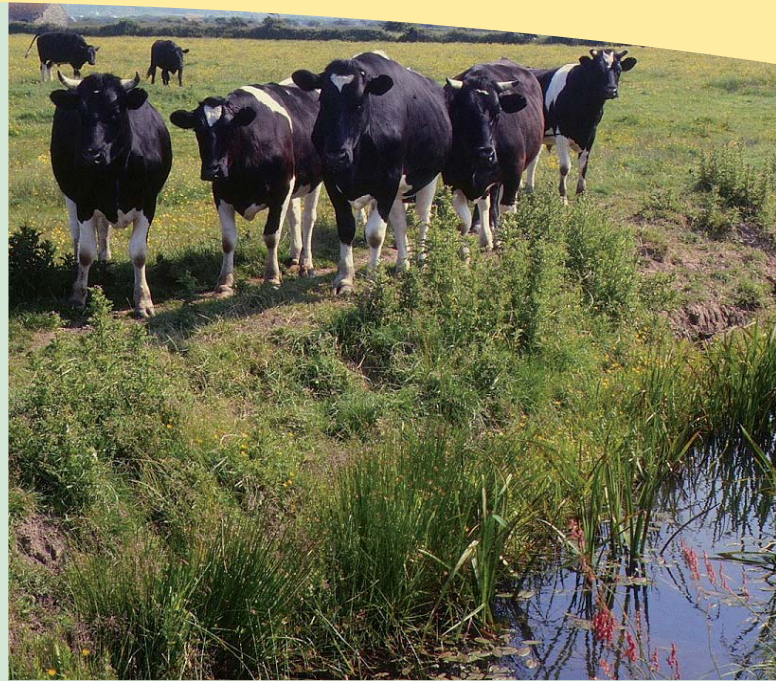




**Grazing marsh ditch systems are an important habitat for plants and invertebrates, among them numerous rare species. Many of these marshes are under threat from development or rising sea levels, so there is a need to create new ditches and to restore degraded sites.**

**Using the experience gained from a Buglife survey of the aquatic invertebrates and plants of grazing marsh ditches, the following recommendations are made for creating and restoring this habitat.**



Braunton Marsh © Roger Key

### Clean water

Pollution results in the loss of sensitive species, so clean water is essential for the maintenance of diverse invertebrate populations. Therefore, when creating new ditches ensure good water quality by:

- Keeping manure, artificial fertiliser and pesticide applications in the surrounding fields to a minimum
- Maintaining the land adjacent to the ditch system as permanent grassland for pasture or hay production
- Avoiding areas that might receive run off from roads, tracks, houses, yards, silage clamps or spoil heaps
- Prohibiting fishing, because stocking with bottom-feeding fish such as carp leads to turbidity and ground-baiting causes over-enrichment of the water
- Ensuring as far as possible that the source of water feeding the ditch system is unpolluted

### Cattle access

Trampling and grazing by stock, especially cattle, create ideal habitat for many invertebrates, producing shallow water in poached margins and varied marginal vegetation heights. However, high numbers of cattle may lead to water pollution and therefore low to moderate stocking levels should be maintained in fields adjacent to ditches. Ditches should be left unfenced to allow cattle access to ditch margins.

### Ditch structure

Ditch size, depth and profile strongly influence the range of invertebrates that this habitat can support. When new ditches are excavated, ideally they should not be uniform along their whole length but should include a range of profiles, from saucer-shaped to deeper, steeper-sided and more conventional shapes. However, even steep-sided profiles should incorporate gentle slopes at the ditch edges, to provide the warm, shallow water suitable for many aquatic invertebrates and a sloping shelf above the water level that is beneficial for wetland species. The creation of larger pools within a ditch system can also increase habitat diversity.

### Ditch creation

- Decide on the exact profile of ditch to be created before you start excavating. You may decide to have different profiles on each side of the ditch in order to increase habitat diversity and allow for requirements of other wildlife such as Water voles (see Drainage Channel Biodiversity Manual in 'Further information')
- To ensure a high water table in the ditch, check that the geology is appropriate and if necessary dig a test hole to ensure that the ditch will hold water
- Use mini diggers or spades for small ditches and a tracked excavator for larger ditches
- New ditches should be at least 1m deep, with sides sloping at an angle of 30-45°

- Create gently sloping margins with areas of water 30cm deep or less
- A new ditch will have high nutrient levels as a result of leaching from the bare soil, so new ditches should not be connected to an existing ditch network until some vegetation has established

## Ditch restoration

If you have an existing ditch poor in wildlife, with sides that are too steep-sided, grants are available for restoration to increase wildlife potential. Details of options for creating and restoring ditches through the Higher Level Stewardship (HLS) scheme are given in Sheet 4 (see below for information). When restoring a ditch, reprofiling should only be carried out on only one side at a time in order to preserve the existing wildlife. Restoration could include diversifying the habitat, as suggested above.

## Creation and restoration for rare and threatened species

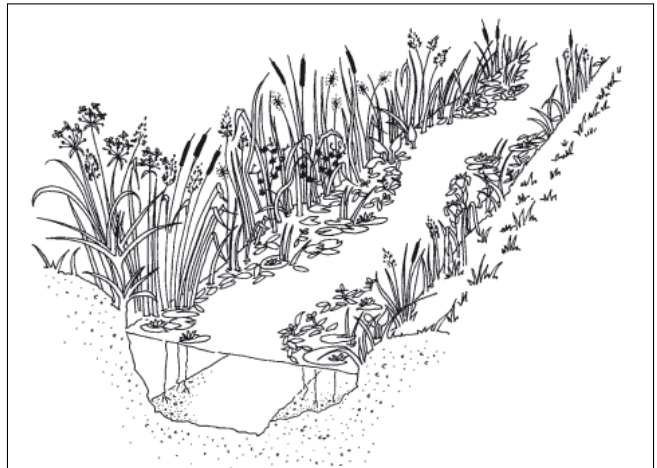
There is limited information available for the conservation of rare and threatened grazing marsh invertebrates species. For example, Buglife has created a management sheet for the Shining ram's-horn snail (*Segmentina nitida*), which is very rare and occurs on grazing marsh ditches in East Sussex, Norfolk, Kent and North Suffolk; and the British Dragonfly Society has written a Management Fact File for the Norfolk Hawker (*Aeshna isosceles*). Links to both sheets are given in 'Further information'.

## Planting

Plants from nearby ditches, ponds and streams will naturally colonise a newly excavated ditch. This may take time, but it will produce the best and the most appropriate local plant species. If the 'no planting' method is not possible, we advise you to consult Flora Locale's website (see 'Further information') to source local plants, or to transfer plants from a nearby ditch, taking care to check that no non-native species are transferred.

Buglife has developed a series of advice sheets on the creation, conservation and management of grazing marsh ditches. These are available at [www.buglife.org.uk](http://www.buglife.org.uk)

- Sheet 1 - **An important habitat for invertebrates**
- Sheet 3 - **Management for invertebrates**
- Sheet 4 - **Agri-environment schemes in England**
- Sheet 5 - **Coastal realignment for invertebrates**



Good wildlife ditch. © The Drainage Channel Biodiversity Manual: Integrating Wildlife and Flood Risk Management (2008) Association of Drainage Authorities and Natural England.

Non-native species should never be planted or transferred because many are invasive and can quickly clog up ditches and it is against the law to plant some of these plants in the countryside. They include Australian swamp stonecrop or New Zealand pygmyweed (*Crassula helmsii*), Parrot's feather (*Myriophyllum aquaticum*), Floating pennywort (*Hydrocotyle ranunculoides*), Water fern (*Azolla filiculoides*), Water primroses (*Ludwigia* species), Waterweeds (*Elodea* species and *Lagarosiphon major*). For more information on non-native species see the Defra website (see 'Further information').

## Managing a newly created ditch

No management should take place until the ditch is well colonised by plants. Once the ditch starts to become overgrown follow the advice presented in Buglife's Grazing Marsh Ditches - Sheet 3.

### Further information

For more advice on grazing marsh ditches see the other Buglife information sheets and the references below:

Shining ram's-horn snail - Buglife Species Management Sheet [www.buglife.org.uk/Resources/Buglife/Shining\\_Ram\\_s-horn\\_snail\\_sheet.pdf](http://www.buglife.org.uk/Resources/Buglife/Shining_Ram_s-horn_snail_sheet.pdf)

Norfolk Hawker - British Dragonfly Society Management Fact File [www.british-dragonflies.org.uk/sites/default/files/aeshna%20isosceles.pdf](http://www.british-dragonflies.org.uk/sites/default/files/aeshna%20isosceles.pdf)

Native aquatic plant suppliers - Flora Locale [www.floralocale.org/content.asp?did=24182](http://www.floralocale.org/content.asp?did=24182)

Non-native plant species information - DEFRA <https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=47>

Buisson R.S., Wade P.M., Cathcart R.L., Hemmings S.M., Manning C.J., & Mayer L. (2008) The Drainage Channel Biodiversity Manual: Integrating Wildlife and Flood Risk Management. Association of Drainage Authorities and Natural England, Peterborough

RSPB, English Nature and Institute of Terrestrial Ecology (1997) The Wet Grassland Guide: Managing Floodplain and Coastal Wet Grasslands for Wildlife



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