GRAZING MARSH DITCHES - Sheet 3

Management for invertebrates

Management of grazing marsh ditches is essential in order to maintain a diversity of wildlife including invertebrates and plants. The following management recommendations are drawn from experience gained through the grazing marsh ditch survey carried out by Buglife (see Further information).

Ditch management © Martin Willing

Managing pollution

Pollution of ditch water should be prevented wherever possible. Contamination from fertiliser run-off or sewage effluent encourages the growth of algae and duckweeds, and can result in reduced oxygen levels. Many invertebrates are sensitive to these types of changes and they can cause a reduction in invertebrate numbers. The effects of pollution are often greatest in small watercourses. Pollution control can be achieved by following the Defra Codes of Good Agricultural Practice and by:

- Low or no inputs of fertilisers or manure on fields adjacent to ditches, to reduce run-off
- Use of grass buffers alongside ditches in areas where there is a high risk of pollution from fertiliser or pesticide application
- Use of constructed wetlands (e.g. reedbeds) to improve water quality from defined pollution problems
- Raising water levels in minor ditches to reduce inflow from polluted main ditches. This is only of benefit if the source of water used to raise the levels is low in pollutants

The positive effects of cattle

The Buglife survey project showed that grazing with cattle is of more benefit to aquatic invertebrate populations than grazing with sheep or no grazing. This is because poaching creates shallow water in which many invertebrate species thrive. Cattle grazing also helps to maintain a varied vegetation structure and minimises shading. Recommended management measures are to:

- Stock fields adjacent to ditches with low to moderate numbers of cattle to allow some poaching of margins and to create unevenly grazed marginal vegetation
- Leave at least some ditches unfenced to give cattle access to ditch margins

Salt levels

Some invertebrates are confined to freshwater, others are salt-tolerant, so distinct invertebrate assemblages and individual rare species are dependent on particular levels of salinity. On marshes where there is a long history of stable, mildly saline conditions, this state should be maintained. However, the occasional influx of strongly saline water into freshwater ditches, as has happened in the Norfolk Broadland, often leads to low biodiversity and so is undesirable.

Vegetation management

Cut ditch vegetation during the period from autumn to early spring. Dredgings should be moved as far away as possible from the ditch as run-off from rotting vegetation can cause water quality problems.

Distinct invertebrate assemblages and individual rare species are dependent on different stages of vegetation development. As different types of ditch vegetation mature at different rates, the ditch cleaning cycle should be tailored to individual marshes, to encourage a balance of vegetation stages, with plenty of open water but also some dense areas. Management approaches that can be used to maintain a variety of vegetation stages are:

- **Stagger clearance:** a clear alternate 10-15m stretches, leaving 10-15m uncleared lengths between. This creates refuge areas from which invertebrates can migrate back into the newly cleared stretches
- **Clearance of one side only** as this allows the uncut side to act as refuge

Common water measurer *(Hydrometra stagnorum)* © Entomart

- **Leaving at least some ditches, or sections of ditches, unfenced** to allow cattle to soften the margins and graze them, so that a fringe of dense low vegetation is encouraged
- **Constructing cattle drinking bays** with a shallow slope along steep-sided ditches, to enable emergent and mat-forming aquatic plants to provide small refuges for invertebrates along otherwise sparsely vegetated margins
- **Maintaining shading at a minimum level.** Most trees and bushes beside ditches should be cut back, to prevent them shading out water plants

Managing invasive plant species

The presence of invasive plant species can have an impact on ditch vegetation and also affect the diversity of invertebrates present. Invasive plants such as Floating pennywort (*Hydrocotyle ranunculoides)*, Nuttall's waterweed (*Elodea nuttallii*), Parrot's feather (*Myriophyllum aquaticum*) and Australian swamp stonecrop (*Crassula helmsii*) all compete with existing vegetation, reducing plant diversity. For information on the control of invasive plant species see Centre for Hydrology and Ecology reference at the end of this sheet.

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

- Sheet 1 - **An important habitat for invertebrates**
- Sheet 2 - **Creation and restoration for invertebrates**
- Sheet 4 - **Agri-environment schemes in England**
- Sheet 5 - **Coastal realignment for invertebrates**

Management of ditch structure

The dimensions and profile of a ditch influence the aquatic flora and fauna that it supports. For more information see Sheet 2 below. Management should aim to provide both deep and shallow water. Shallow areas are important for invertebrates as they provide warm 'microhabitats'. Beneficial management practices include the following:

- **Reduce the steepness of ditch banks** to 30-45° allowing grazing and poaching of ditch margins and to encourage a wide band of emergent vegetation to develop. But note that gentle gradients are unfavourable for water voles. If you are in an area where water voles occur, aim to have one ditch bank with a steep and the other with a gentle gradient
- **Provide an underwater ledge** or berm of 30cm or less to create water about 30cm deep, at the base of one bank
- **Avoid over-deepening ditches** during ditch clearance, but re-profile to create a gentle gradient with the centre-channel at least 1m deep
- **Maintain high water levels** so that the sloping upper bank is submerged, giving plenty of shallow water
- **Provide a variety of profiles for any new ditches that are dug,** from relatively deep with sloping sides to shallow and saucer-shaped
- **Areas of bare sediment** should be left during management, but not total clearance of ditch, as these areas are favourable to some animals and plants such as stoneworts

Agri-environment options

For more information see Grazing marsh ditches - Sheet 4.

Further information

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

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

For invasive plant species identification see the GB non-native species secretariat:
https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=47

For information on invasive plant species control see the Centre for Hydrology and Ecology website
http://www.ceh.ac.uk/sci_programmes/AquaticPlantManagement.html

DEFRA Codes of Good Agricultural Practice
http://archive.defra.gov.uk/foodfarm/landmanage/cogap/documents/cogap090202.pdf

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