

There is a widespread need for reconciliation of management of ditches for their drainage functions with the support of biodiversity and associated ecosystem services. We present results of the literature review on the biological state of agricultural drainage ditches in the temperate and boreal zones of the Northern Hemisphere.

Ditches for Life

or Biological Value of Drainage Ditches

A total of over 300 publications and unpublished reports were reviewed as relevant to the review objectives with about 150 dealing with ditch biota (Map).

Most ditches support species also common elsewhere, and therefore can be regarded as habitats of lower quality than larger and more stable water environments, such as streams and lakes. However, whenever comprehensive surveys were conducted, the biodiversity value of ditches was shown to be considerable in providing wet vegetated non-cropped habitats to both aquatic and terrestrial species, supplying food resources lacking in otherwise dry and intensively managed cropland, and performing connectivity functions within a wider landscape. Regionally ditches were shown to harbour a suite of species of conservation value or species not found presently in other farmland habitats.

Some functions of ditches – regulating water flow and nutrient retention - are likely to depend on the composition and structure of biological communities of ditches, though the issue remains poorly explored.



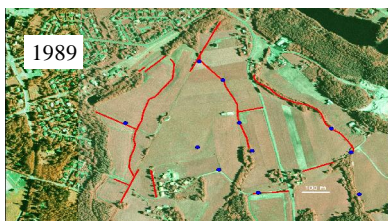
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Crayfish (*Astacus fluviatilis* and other spp.) and **Salmon** (*Truto truto*) are examples of species with a high economical and recreational value, benefiting from ditches. Especially former streams with clean water and overhanging vegetation are valuable.

Ortolan Bunting (*Emberiza hortolana*) is a species of no apparent "value", which is closely associated with ditches in farmland. It is totally dependent on farmland and has been on a steady decline across Europe (80% decline in Finland). Protected by the EU legislation, at least on paper. The bird requires ditches as nesting sites and ditch margins for feeding.

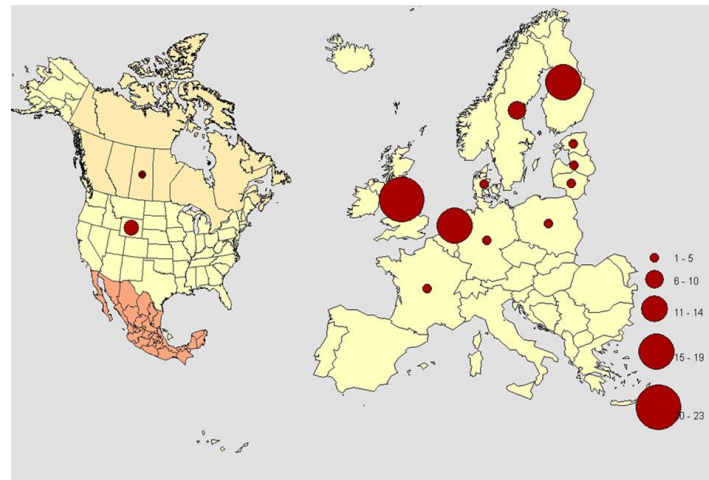


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Lines are ditches, and dots are territories of the rare bunting (courtesy of V. Vepsäläinen, unpubl.)

The number of publications on biota in ditches by countries



Drainage: subsurface drainage, canalisation, management etc.

Environmental quality:

- nutrient concentrations
- pH status
- oxygen level

Biodiversity:

- species composition
- species abundance

Other services:

- resource provision for higher taxa
- landscape amenity
- science/recreation
- pollination of crops
- biomass, etc.

- water retention
- denitrification
- sedimentation
- degradation of plant protection agents

Recommendations:

- establishing biological value of ditches across Europe, especially in Central and East Europe;
- determining functioning of ditches in removal of chemicals and eroded soil particles (e.g., efficiency of a ditch network as compared to a sedimentation pond), and provision of other services (e.g., quality habitat);
- acknowledgement of the biodiversity value of ditches on the agendas of relevant political and engineering bodies;
- developing a methodology on ranking ditches by their relative importance in providing various functions (drainage vs. pollution mitigation vs. habitat) in order to adapt management to support several functions, and to allow recovery of former streams and wetlands.

Herzon, I. and Helenius, J. 2008. Agricultural drainage ditches, their biological importance and functioning. *Biological Conservation* 141: 1171-1183.