



General guidance to managing springs and seepages for wildlife

Freshwater springs and seepages are small in scale, but are still important as they support specialist invertebrate communities and a number of species of conservation concern. However, they are vulnerable to damage through changes in land management and changes to the supply and quality of groundwater.



A poached seepages line at Hense Moor, Blackdown Hills © Sharon Pilkington

In order to maintain the unique, stable, conditions found in springs and seepages, there are some general actions that can be followed.

Clean water

Clean water is essential to support the specialist invertebrate and plant communities associated with springs and seepages.

Reductions in water quality will damage the invertebrate community of a spring or seepage and can result in the permanent loss of sensitive species from the site.

Springs are formed where groundwater emerges at the ground surface. Groundwater is naturally very clean because of the filtering effect of the rocks in which it is held. However, groundwater is vulnerable to both point-source and diffuse pollution from nutrients or artificial chemicals. Pollution that enters groundwater can re-emerge in springs.

Diffuse pollution from agricultural run-off and industrial effluent can lead to poisoning of wildlife, nutrient enrichment of the habitat (eutrophication) and the silting up of springs and seepages. Enrichment can unbalance aquatic communities, through increased growth of algae, for example.

To reduce the risk of diffuse pollution, the use of herbicides, pesticides or fertilisers on surrounding land should be avoided or minimised. Surrounding fields should ideally be laid to pasture rather than to arable.

The use of buffer strips around sites with seepages and springs is recommended to help reduce the input of diffuse pollution and silt.

Water supply

A constant supply of water is vital to maintain the characteristic invertebrate life of springs and seepages. If the water supply is reduced, water levels may be lowered,



A tufa cascade at Packsaddle Bridge in the Mendips © Sharon Pilkington

or they may dry up completely, which is likely to prove fatal for most of the specialist species present. Reductions in the supply of water can be caused by groundwater abstraction within the catchment. Freshwater habitats are most vulnerable during periods of drought, when demand for abstraction from groundwater aquifers can increase considerably and water tables are not being replenished.

A review should be carried out of licensed water abstractions that are likely to impact on the water supply for seepages. The review should take account of periods of drought and future climate change scenarios. The review should include existing as well as new applications.

Abstraction at the source of a spring results in the lowering of the water table at the springhead, a reduced discharge downstream and lower flow which will affect the ecology of the river downstream and associated fisheries. This should be avoided.

Quarrying and rock blasting can result in detrimental changes to local groundwater hydrology and could lead to springs and spring-fed streams drying-out and/or migrating downstream. Water extraction from quarries can lower the water table further and is a considerable threat to springs and springhead habitats.

Maintaining a relatively stable water level around seepages in marshy areas and woodland carr is beneficial for many species. Seasonally fluctuating water levels can be important for some species e.g. snail-killing flies (sciomyzids), and should be maintained.

Physical modification of the spring or seepage

Springs are often exploited as a naturally-occurring source of fresh water. They are often “capped” to prevent contamination. Capping and abstraction at source will, in most cases, destroy the habitat, and should be avoided.

Another form of physical habitat destruction is the conversion of springs to ponds. Ponds are an important habitat in their own right, but creating new ponds should not be at the expense of other habitats of high wildlife value.

Tufa is a soft, calcareous deposit which is formed by “hard water” that emerges from springs in limestone regions. Removal of tufa for use as an ornamental stone damages and destroys sensitive habitat features that can take centuries to develop. Springs with tufa formations are protected under the Habitats Directive.

Disruption to natural spring-lines by land drainage works should be avoided. Hillside flushes and valley mires should be left undisturbed.

Natural vegetation such as Hemlock water-dropwort (*Oenanthe crocata*) and Butterbur (*Petasites hybridus*) should be retained because the flowers of seepages are very important for bees, hoverflies and other insect pollinators.



Banded general (*Stratiomys potamida*) © Steven Falk

Shallow areas of wet moss, liverworts and mud are valuable micro-habitats for soldierfly larvae.



Example of excessive soil poaching at a seepage © Sharon Pilkington

Managing the land around springs and seepages

Springs and seepages can be extremely sensitive to the management of land around them. Changes to land-use can increase the risk of diffuse pollution from agricultural run-off, or input of silt degrading a seepage. Ploughing directly destroys the habitat, and overstocking by livestock can damage springs and seepages through trampling or over-grazing.

Each spring and seepage is unique and expert advice should be sought regarding their management

Livestock grazing and poaching of ground

Grazing

Without some form of management, natural succession can result in sites turning into wet woodland. The exception to this is unstable slopes associated with coastal landslips such as the Lyme Bay undercliffs. Here the substrate is unstable and vegetation may struggle to establish because of land slips.

Grazing by wild herbivores or livestock helps to maintain an open structure in the vegetation of seepages occurring in grassland and other open habitats¹. Many bryophytes associated with seepages in open habitats require well-lit conditions.

A low intensity grazing regime is often most appropriate for seepages and springline mires in grassland situations to maintain floristic diversity and open conditions whilst minimising damage.

Soil Poaching

Poaching of the ground by the hooves of large animals damages the structure of the soil, and can trample delicate plant communities. Seepages with deep peat are particularly sensitive to poaching from livestock.

A limited amount of poaching is beneficial for some lower plants and invertebrates that thrive where exposed peat or mud is otherwise absent, for example, the pioneering bryophyte species Common bladder moss (*Physcomitrium pyriforme*). The presence of bare or sparsely vegetated mud or peat is important for many flies and beetles. Also, hoof prints can act as temporary water bodies, used by the caddisfly *Limnephilus sparsus* for example¹.

If poaching occurs in a field (or wood) that has historically had stock present, it may be logical to continue that regime for the fauna now present. However, severe poaching that destroys moss and plant communities is very damaging and should be avoided.

It is not recommended to introduce grazing to a previously ungrazed site (unless there are very good reasons).

Invasive species

The accidental introduction of invasive exotic plant species to springs and seepages such as the Water fern (*Azolla filiculoides*)² and New Zealand pigmyweed (*Crassula helmsii*)³, is a considerable threat. This is because they may form dense infestations and out-compete native flora and fauna. Care should be taken not to introduce non-native plants to springs and seepages.

Climate change

Climate change may result in a warmer climate with drier and longer summers. This may increase the likelihood of drought in areas where groundwater abstraction is in demand. If the replenishment of groundwaters is affected, this may result in the increased drying of springs and seepages. This may have severe impacts on their associated fauna, and is likely to cause local extinctions.

Consider what could be done to mitigate against climate change on sites, such as undertaking a review of licensed



Geyer's whorl snail (*Vertigo geyeri*) © Francisco Welter Schultes - Wikimedia Commons

One species which may be affected by climate change is Geyer's whorl snail (*Vertigo geyeri*). This Section 41 (S41)⁴ species is found in highly calcareous seepages and fens in the UK. A continuous supply of water is essential to maintain habitat conditions for this species. Potential alteration to rainfall patterns caused by climate change could have a significant impact on this species. JNCC (2007)⁵.

water abstractions that are likely to be hydrologically linked to seepages, and limiting or revoking those that potentially impact on water supply.

Retaining a tree canopy over springs and seepages may shade them and help to keep shallow water cool - mitigating against warmer summer conditions.

Further information

¹ Kirby, P. (2001) Habitat Management For Invertebrates: a practical handbook. RSPB Management Guides

² GB non-native species secretariat (2011) Water Fern, *Azolla filiculoides* factsheet (online) Available at <http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=451>

³ GB Non-native species secretariat (2015) New Zealand pigmyweed, *Crassula helmsii* factsheet (online) Available at <http://www.nonnativespecies.org/factsheet/factsheet.cfm?speciesId=1017>

⁴ The Natural Environment and Rural Communities (NERC) Act came into force on 1st Oct 2006. Section 41 (S41) of the Act requires the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. These were formerly UK Biodiversity Action Plan (UKBAP) priority species.

⁵ Joint Nature Conservation Committee (JNCC) (2007) Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17

Buglife has developed a series of advice sheets on the conservation, management and restoration of springs and seepages. These are available at www.buglife.org.uk. Whilst these sheets have been developed as part of the Wessex springs and seepages project, much of the habitat management advice is applicable to other parts the United Kingdom.

- Sheet 1 - **Springs and seepages - An important habitat for wildlife**
- Sheet 3 - **Managing springs and seepages in woodlands**
- Sheet 4 - **Managing springs and seepages in grasslands, heathlands and open habitats**
- Sheet 5 - **Managing springs and seepages on coastal cliffs**



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