

Responding to climate change – a personal and Agency view

At the time of writing, heads of state and government officials from 192 nations are meeting in Copenhagen to strike a deal to reduce the planet's greenhouse gas emissions. There now seems little doubt (most would say no doubt) that climate change is happening and that urgent action is needed if damaging rises in global temperatures are to be avoided. When I say 'action' this includes a greater than 70% cut in global greenhouse gas emissions by 2050.

So, what are the implications for bryophytes? This is not a simple question because although global temperatures will undoubtedly rise, local changes in climate are less easy to predict. For example, some areas are likely to become wetter, and others drier, some windier and others not. Similarly, changes in winter climate may differ from changes in the summer. One thing we can be sure of though, many of our bryophytes will have to cope with some form

of change, either in the distribution of suitable climate, or in the frequency of extreme events, such as drought or flood. Some changes can be predicted with more confidence than others; for example, in Scotland we are confident that in the medium term, say by the 2050s, the amount of precipitation that falls as snow on Scottish mountain tops will decrease. This is very likely to put late-lying snow-bed bryophytes at risk through competition with larger mountain plants that will take advantage of lengthening growing seasons. It is in our mountains that we may expect to see the first bryophyte-dominated communities disappear unless climate change is halted. It is generally accepted that climate change will have a profound impact on natural heritage and that we will witness very significant changes to our ecosystems within a timescale measured in decades.

I work for Scottish Natural Heritage (SNH), the Scottish Government's agency with statutory

responsibility for nature conservation. I have been asked on a number of occasions what agencies such as SNH are doing in response to climate change? I will lay my cards on the table and give my personal view that although government agencies have an important role, when it comes to action, responsibility lies firmly with every one of us; in the lifestyle choices we make and if we own land, in the way we manage that land. Similarly, governments have an important role to play, but need support from us as voters for what might be tough decisions. BBS members, with an interest in bryophyte conservation, might feel a greater responsibility than most to tackle the challenges of climate change, but this is, of course, for you to decide.

All of this said, government agencies have some key roles and responsibilities in helping mitigate the effects of climate change and in helping society and nature adapt to its consequences. SNH has outlined how it will approach this role in an action plan* where three key contributions are described: (1) helping to understand and publicize the effects and consequences of climate change for the natural heritage; (2) advising on infrastructure and land management practices with help to mitigate climate change; (3) guiding adaptation so that nature can, as far as possible, adapt to a changing climate and so that people can make best use of natural processes in preparing for climate change. I think these are important functions and each requires bryophytes to be considered. Below are some examples of how SNH has done this to date.

In 2008, SNH entered a partnership (including BBS) to monitor the potential impacts of climate change on bryophyte-dominated snowbed vegetation. The project looked at historic changes in community structure and set up detailed monitoring transects to assess future changes in extent and distribution of species. Changes in the core

community were detected, including a worrying increase in vascular plant cover in the core community. These bryophytes might be one of the first indicators of serious change and provide a lamentable, but important role in demonstrating the real biodiversity impacts of climate change.

In an effort to reduce CO₂ emissions, we are seeing greater investment in wind and hydro-electric generation schemes. SNH has an important role to play in ensuring these schemes have the minimum negative impact on nationally important bryophyte communities and their habitats. SNH are also helping to better understand what the impacts of these developments will be on species, for example, in determining where the most important sites are prior to development plans and in assessing the impact of water abstraction on the humidity and humidity-loving bryophytes of oceanic ravines.

Although it is difficult to predict the response of individual bryophytes to climate change, ensuring that the extent, condition and connectivity of existing bryophyte habitats is maintained is an area where SNH plays an important role in helping species adapt to a changing climate. This is done in a variety of ways, such as monitoring the condition of sites where bryophytes are an important feature; securing appropriate grazing levels and controlling non-native species; and through providing tools and incentives for land managers to increase the connectivity of existing habitat fragments.

There are challenges, and perhaps opportunities, ahead, but let's hope that by the time you read this edition of *Field Bryology*, the diplomats in Copenhagen have reached significant agreements to reduce global emissions. Let's also hope that we, as individuals and as a society, can be positive and work with Government and its agencies to meet these targets and to manage habitats in a way that gives our bryophyte flora the best possible chance.

*SNH (2009) *Climate change and natural heritage: SNH's approach and action plan*. www.snh.gov.uk

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