

# Scottish Bird News

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## Global warming and Scottish land birds



*Scottish Bird News* readers will be used to claims about harmful effects of global warming on Scottish land-birds. Here, Adam Watson criticises some of these claims, most of which have been in newspapers and magazines, but some in reports by organisations and consultants.

Many claims about climate change reveal inexperience of Scottish birds in both field and literature and press exaggerations exacerbate this. In December 2006, *The Observer* carried an article by its science editor. When interviewing me, he asked if Scottish alpine plants are moving uphill because of warmer climate, and soon would have nowhere to go. Witnessed by a colleague, I replied "I've seen no sign of it and no paper with good evidence of it". His article ran 'All native species are being pushed further and further up the mountains', said Watson. 'Soon they will have nowhere to go'. Enough said! Because the press can exaggerate, below I do not name anyone whose comments were reported by newspapers.

*The Press & Journal* of 4 February 2005 announced, 'Ptarmigan doomed, warn

scientists'. We read that 'leading scientists' and 'experts' predict that a rise 'in world temperatures could soon make the bird extinct'. Then 'Ornithologists are also forecasting that future climate change could threaten the populations of other upland species such as' Greenshank, Red Grouse and Golden Plover. Such 'forecasts' are mere guesses, ignoring other factors such as habitat loss to tree-planting and overgrazing.

Wilder assertions were in *The Scotsman* of October 7, 2006, headed 'Is Ptarmageddon Day looming for many of Scotland's rare birds?'. The report continued 'Bird-watchers yesterday issued a warning to the Scottish executive that birds like the Ptarmigan, Snow Bunting and Dotterel could migrate to Norway, Greenland and Iceland if CO<sub>2</sub> emissions are not reduced'. 'But rising CO<sub>2</sub> emissions in recent years mean that the numbers of birds have fallen – the number of breeding pairs of Snow Buntings in Scotland has reduced in recent years to 100.' In reality, 100 pairs constitute the highest-ever estimate.

*View from Caim Gorm to Caim Lochan, mid-May*  
Ian Francis

*The Herald* of 20 January 2007 reported a project on climate 'prediction', developed for the BBC, 'Rising temperatures are already believed to be causing semi-Arctic habitats to recede north or to higher ground, making life difficult for mountain birds, such as the Ptarmigan'. Use of the present tense is unjustified, for no good evidence of habitats receding north or moving uphill has been published, or for life being more difficult for Ptarmigan. And, 'There are areas of the Cairngorms



*Male Dotterel near Glenshae* Ian Francis

which in the past have been covered by snow throughout the year. These permanent snow patches melted last year.



Ptarmigan in mist Ian Francis

This is having a big effect on bryophytes, including all sorts of mosses and liverworts, which depend on a permanent source of snow melt'. The data on snow in 2006 are published (A. Watson, D. Duncan & J. Pottie 2007, No Scottish snow survives until winter 2006/07. *Weather* 62, 71-73). However, the patches are only semi-permanent, and all melted in four other years since 1900. Also, no vegetation lies under the longest-lying snow, just gravel, and many species do not depend on permanent snow melt, but favour cold springs that are not under the longest-lying snow.

Invalid claims are not confined to newspapers and magazines. At a conference in Aviemore during autumn 2006, Jim Knight, Westminster Minister for Rural Affairs, announced a report on climate by the Department of the Environment, Food and Rural Affairs. In a speech that mentioned Ptarmigan and Dotterel in the Cairngorms, he warned, 'warmer temperatures were pushing migrating species towards the poles'.

#### Scientific reports

In a press release (6 March, 2007), SNH announced 'The Long March - Spatial Adaptation to Climate Change', a project to help species move north as the climate warms. 'Duncan Stone is coordinating the strategy to identify potential barriers and geographical pinch-points where species might be prevented' from moving. An example was, 'Some woodland birds such as the Tree Creeper' move only 10 metres from woodland cover, though are capable of flying miles. This reveals inexperience of the field, for Tree Creepers and other woodland species often breed in small isolated plantations surrounded by miles of moorland. Again we see emphasis on a desk-project and on uncritical spin.

Consider two much-publicised habitats, the alpine zone and Caledonian pinewood. Many readers would regard

*The state of the UK's birds 2004* as authoritative, because it was published by RSPB on behalf of seven voluntary and state organisations including BTO, SNH and English Nature. However, the 'Climate change' section shows surprising lack of field experience and critical thinking. 'The species likely to be at the most immediate risk of extinction in the UK are those that breed in the moss and lichen-dominated Arctic-alpine habitat found in the Cairngorms and a few other high-altitude areas in northern Scotland, such as Snow Buntings and Dotterels. As temperatures increase, so plant species from lower altitudes will begin to move up-slope and encroach on this already scarce habitat. As there is no higher altitude ground to move to, the total area of Arctic-alpine habitat in the UK will start to decrease and by 2050 it may have disappeared altogether'.

These claims rest on the assumption that temperature controls the area of alpine land and that climate is temperature. But alpine land comes to low altitudes in windy places, indeed close to sea-level in north Sutherland. Winters there are mild, with little snow and frost. Also, Britain has already become windier, and meteorologists predict more gales due to warming. This should expand the alpine zone downhill. Only a continental climate would move it uphill, as in the warmth after the last glaciers melted.

An RSPB report (2000, *Climate change*) claims, 'Ptarmigans - they could lose their last British sites in the Scottish highlands as the montane habitat they need disappears'. And, 'For some birds, particularly in Scotland, warmer winters may lead to the disappearance of the montane habitats on which they depend to breed. Under climate change, Dotterels, Ptarmigans, and Snow Bunting could die out'. This has the same flaws as above,

Research has revealed a trend for snow patches in Scotland to vanish more frequently (A. Watson, D. Duncan & J. Pottie 2006. Two Scottish snow patches survive until winter 2005/06. *Weather* 61, 132-134). If this trend continues, snow-patch vegetation may decline, which might adversely affect Ptarmigan and Snow Buntings. But there is no published evidence, and I know of no funded Scottish field research on populations of Ptarmigan or Snow Buntings in relation to climatic change.

The Cairngorms National Park Authority announced (*Strathspey & Badenoch Herald*, 28 February 2007) that it will lead on tackling climatic change. A spokesman was reported saying of the Cairngorms, 'obviously if there is less snow then we will have difficulty in protecting species such as

the Ptarmigan'. Fine words, but new signs at roads into the Park cost £537,000 of taxpayers' money, while the Authority has funded no field research on habitats or species in relation to climatic change.

One would expect that bodies such as SNH would for years have been doing or commissioning much fieldwork on the topic. Big sums have gone to salaries of 'climate change officers' and to consultants for desk-reports. Their assertions belie surprising ignorance of the field and of past literature. Much of the little Scottish fieldwork on the topic since 1997 has involved individuals in their spare time, using their own money. So much more could have been achieved, had bodies such as SNH and CNPA funded fieldwork. Actions speak louder than words.

Almost all the publicity emphasises warming, but cooling is also a threat. Warming in the Arctic has released more fresh water from melting ice and snow, which has weakened the circulation that maintains the Gulf Stream. If the Stream were to become seriously weakened or switched off, Scotland would turn much colder, at least in the short run. This would severely affect agriculture and human life, let alone wildlife. Results might be more catastrophic than those from continued warming. This does not lessen warnings about more warming. It adds to them, showing that risks are many and unpredictable.

#### Caledonian pinewoods

Let us turn to Caledonian pinewood in *The state of the UK's birds 2004*. We read, 'The Scottish Crossbill, the UK's only endemic bird, has been identified as being potentially at risk of extinction owing to climate warming. By the end of the 21st century, the climate 'envelope' occupied by Scottish Crossbills might only be found in Iceland and so they will either have to move (which seems highly unlikely), adapt to new conditions in Scotland or face extinction.' The flaw is the assumption that temperature controls pinewood habitat.

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Deeside pinewoods - habitat for Scottish Crossbills Ian Francis

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The main Caledonian pinewoods survived because the glaciers left very freely drained soils (often sand or gravel, as in Abernethy) that are acidic because of the bedrocks from which they originated. In a climate with more precipitation than evaporation and transpiration, this produced podzols, so infertile that they could not be cultivated.

Soil changes under natural conditions are extremely slow, and the consensus is that it may take 1000 years for soil in temperate regions to reach a relatively stable state. Also, soils are resistant to change under natural conditions. Hence the infertile podzols of Caledonian pinewood should continue, as should plants that prefer them, such as heather and pine, and animals that use these plants, such as crossbills. Also, Scots pine thrives on land far hotter than Scotland, such as some Mediterranean regions. The key factor is soil.

The assertion that the 'climate envelope' of Scottish Crossbills might be found only in Iceland implies extinction of our pinewood and its colonisation of Iceland. This too is unrealistic and belies inexperience. Icelandic soils are derived from volcanic rock, mostly base-rich. The fertile freely-drained soils favour birch, not pine. Also we read, 'More worryingly, climate warming may also lead to the loss of species restricted to breeding....in northern Scotland, such as Whooper Swans, Arctic Skuas and Greenshanks'. The Greenshank claim seems odd, for the bird nests across vast Eurasian regions where summer heat far exceeds that in north Scotland.

#### Impacts on alpine species

In 2005, *The Mountains of Northern Europe*, published on behalf of SNH and the Centre for Mountain Studies, included a chapter on climate change. It is well known that air temperature falls with altitude, 1°C per 200-275 m. If mean temperature rises by 1°C, it was asserted that 'Organisms inhabiting arctic-alpine habitats above 600 m in 1960-91 will therefore need to move to 800-875 m to experience similar conditions. This would result in about 90% and 96% reductions in arctic-alpine extent in Scotland and Wales, respectively.' It was claimed that declines of Ptarmigan, Dotterel, Snow Buntings and Mountain Hares would be likely, and certain plant species would lose all 'climate space' in Britain. Again, these assertions rest on the fallacious assumptions that climate is temperature and that habitat is determined solely by temperature. The authors ignore wind as a factor causing alpine habitat and predicted to increase with warming. At root, the concept of 'climate space' or 'climate envelope' is uncritical when taken thus far.

Naming Mountain Hares is dubious, for their densities on moorland generally far exceed those on alpine land. And they thrive at sea-level in the mild winters of west Scotland and Ireland. Their habitat depends on short food-plants, not temperature.

In *The Scotsman* (November 4 1999), a senior SNH officer was reported saying of Scottish alpine land, 'several bird species, already in decline, would soon be on the brink of extinction. In as little as 50 years, he predicts breeding pairs of Ptarmigan will fall from 10,000 to 1,000, and Dotterel from 840 pairs to less than 50. He said SNH would now be ...updating its model for predicting the effects of climate change'. Such numerical detail cannot be attributed to press overstatement, so must have been said. There is no good evidence of these species being 'already in decline', or of 10,000 Ptarmigan pairs. The 'predicted' 90% Ptarmigan reduction tallies with the invalid SNH assertion (above) of 90% less alpine land, so is evidently based on it. The Dotterel decline (over 94%) tallies with neither, so seems baseless. Note that SNH would be 'updating its model', not funding new fieldwork.

#### 'Climate space'

A paper appeared in 2006 (B. Huntley and six co-authors, *Ibis* 148, supplement 1, 8-28) on 'Potential impacts of climatic change upon geographical distributions of birds'. Based entirely on modelling, it compares atlas information on bird distribution with air temperature, precipitation and sunshine. The authors claim a good fit between distribution and weather factors, as is to be expected. Maps show current distributions of several species, beside distributions based on predicted changes in temperature, precipitation and sunshine. 'Of the European species modelled, 11 have zero overlap between their potential future and present distributions in Europe for all three future climate scenarios explored; these include the endemic *Loxia scotica* (Scottish Crossbill), that thus must be considered to be at extreme risk of global extinction as a result of climatic change'. As mentioned above, this omits that the key natural determinant of the crossbill's pinewood habitat is soil. Authors adduce no data or analyses to back their claims on birds, and cite no past publications of theirs that give such data or analyses. Such a lack is unsound practice in any original scientific paper whose results have not been published previously, as is the case here, and unsound for editors and referees.

One may ask why the above bodies and their scientists ignore the scientific method and its testing of assumptions and alternative hypotheses. Perhaps they wish to jolt people out of complacency about global warming. This, however, would be

unethical for bodies claiming to rest their policies upon science. Also, it carries risks. Unscientific, ideological critics of conservation effort by these bodies are thereby handed arguments for discrediting them and lobbying politicians to curb them.

#### Scientific research needed

Global warming poses grave world threats to man and the wild species that now depend on us. Scotland also faces severe potential threats from warming, including possible cooling due to the Gulf Stream being switched off. The public and politicians need reliable information. Yet, state and voluntary conservation bodies do little new fieldwork. The emphasis is on woolly assertions in desk-reports and uncritical papers. 'Spin' on climate often pervades conservation bodies, when the need for rigour and critical refutation of hypotheses is paramount. I have come across defensive attitudes by some individuals when their unjustified claims are criticised, yet science needs criticism. Also, they evidently ignore the wealth of understanding on habitat, which helps explain the abundance and distribution of plants and animals. Air temperature is only one factor, not necessarily crucial, often not crucial.



View from Ben Macdui northwards - mid-May  
Ian Francis

This article will have done some good if it helps readers be critical and check whether claims rest on evidence rather than bias, and if they spur organisations to fund fieldwork. There is also one final point. In 2007 the Centre for Ecology and Hydrology is to close stations at Monkswood and Banchory, noted for past and present fieldwork on climatic change in relation to wildlife, and the Meteorological Office faces cuts in its budget for research including work on climate. Westminster and Holyrood governments could have stopped these changes, but acquiesced in them. Yet in January-April 2007 the Prime Minister, Chancellor Gordon Brown and Scottish Ministers proclaimed that climate change is the greatest threat to man, and Holyrood First and Deputy First Ministers said Scotland should be a "science nation". Spin rules.

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