

JOINT NATURE CONSERVATION COMMITTEE

THE STATE OF SYSTEMATIC BIOLOGY IN THE UK AND ITS RELEVANCE TO BIODIVERSITY CONSERVATION e.g. FIELD LICHENOLOGY IN SCOTLAND

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1. Background

- 1.1 In 1992, the House of Lords Select Committee on Science and Technology published a report on the state of systematic biology¹ research in the United Kingdom which recommended action to remedy what was seen to be a significant weakening of expertise in this area. This report (sometimes referred to as the Dainton Report) included amongst its recommendations that:
- i. core funding should be maintained in real terms to enable research to continue and for curation of collections in major systematics institutions;
 - ii. special funds should be set aside by the relevant research councils for systematics research and by the Government body in charge of museums for curation of collections;
 - iii. a new forum for systematics be created to rationalise holdings and expertise;
 - iv. MSc courses should be funded to supply trained specialists.
- 1.2 Following publication of the Dainton Report, a number of short-term measures to stimulate systematic biology were introduced, including the NERC Taxonomy Initiative (1994-98) aimed at regenerating taxonomy in universities, the Wellcome Trust Biodiversity Initiative (1993-2002), which applied new methods, such as molecular biology techniques, to systematic biology, and the UK Systematics Forum which sought to provide a focus for systematic biology in the UK. These initiatives have effectively now ended.
- 1.3 Early in 2002, the House of Lords Select Committee on Science and Technology undertook a follow-up Inquiry into Systematic Biology and Biodiversity, and its report was published in May 2002. The report concluded that, since 1992, core funding to the major systematic biology institutions had

¹ Systematic biology is the scientific discipline in which biologists discover, describe, name and classify living things and investigate evolutionary relationships between them.

declined in real terms and that this had led to a decrease in research that supports biodiversity conservation, despite the fact that the Convention on Biological Diversity had been signed in 1992 and the UK had entered into a range of obligations relating to biodiversity under that Convention. The report also concluded that constraints on funding had placed the reference collections of specimens comprising a wide range of biodiversity, which are housed in these institutions, at considerable risk. The report made a number of recommendations to improve the situation, and these are set out in Annex 1.

- 1.4 Along with a wide range of other institutions and bodies, JNCC had submitted evidence to the Select Committee's enquiry. One of the key points in JNCC's evidence has been reflected in recommendation number 8 of the report, namely that DEFRA should take the lead in setting up a body comprising representatives of Government departments, ecologists, conservationists and the systematic biological community to develop and promote priorities for taxonomic research and to seek resources to redress the taxonomic impediment to conservation action.

2. Practical effect of reduction in availability of expertise field taxonomy

- 2.1 Systematic biology underpins work on the conservation of biodiversity, and a lack of skills and knowledge in this branch of science can constrain our efforts to conserve biodiversity, a reduction in expertise in systematic biology can lead to practical problems for biodiversity. An example of this, is provided by the state of field lichenology in Scotland.
- 2.2 The UK, and in particular Scotland, is a biodiversity hot-spot for lichens and we have a high degree of 'international responsibility' for their conservation. Many of our efforts to protect these species are delivered through the protection afforded by the SSSI network and, more recently, the UK biodiversity process. Species Action plans exist for 37 lichens found in the UK. For a number of these species taxonomic skills are required in order to identify accurately the species for survey and monitoring purposes. Systematic biology also has an important role to play in developing our understanding of how some of these species reproduce, on appropriate cultivation techniques and for developing an understanding of their relationship with their host species. Overall, the UK Biodiversity Action Plan process has brought tremendous benefits to our knowledge of the distribution, autecology and conservation requirements of many lichens. However, without some investment and training of lower plant specialists in the near future this progress will halt.
- 2.3 In Scotland in 2001, there were only four field lichenologists of repute available for site monitoring and other contract work relating to the identification and survey of lichens. By 2002, due to changes in location and work commitments, none of these field lichenologists were available for contract work in Scotland. This situation is likely to continue for the foreseeable future. The situation is little better with respect to fungi, where SNH knows of just one field mycologist, able to tender for SNH's

requirements. Thankfully, the situation for field bryology is a little better, with 3 or 4 consultants available to work in Scotland.

- 2.4 The lack of lower plant specialists is now preventing SNH from meeting its commitments to survey and monitor lichens and other lower plants, as required for Site Condition Monitoring of SSSIs. It is also unclear how some of the requirements flowing from the UKBAP for lichens and other lower plants can be addressed without suitably-experienced experts able to take on work in the field. Although appropriate contractors may still be available in England and Wales, these are clearly few in number and limited in their overall capacity; any further loss of contractors could, therefore, lead to similar problems being faced by the other country agencies. The situation for the fungi may also become critical in the near future.
- 2.5 SNH have discussed these issues with PlantLife at meetings in February and March 2002, and identified the following possible courses of action:
- i. trawl all research institutes and universities to identify whether their are lichenologists and other lower plant experts within these institutes who might be available to tender for research and survey work;
 - ii. 'Import' lichenologists from the Continent, since countries like Denmark still produce specialists in these fields who might well appreciate the opportunity to study lichens in Scotland;
 - iii. prepare practical business guidance advice to encourage amateur lichenologists to step across the divide into freelance contract work, recognising that there is significant demand for such contract appointments;
 - iv. Grant-aid a studentship in lichenology at a suitable university or research institute;
 - v. Grant-aid a course in lower plants at one or more universities and/or research institutes, to encourage more students to consider studying cryptograms;
 - vi. Grant-aid a 'champion' for lichens, through the British Lichen Society or PlantLife, perhaps based at one of the botanic gardens or other appropriate institutes, to promote the study of lichens, and the career opportunities they may present, through lectures and other available academic channels;
 - vii. look to include lichenology/taxonomy as a key role within Advisory Services in SNH.
- 2.6 The problem of limited availability of expertise in systematic biology as illustrated above in relation to lichens, and the lower plants more generally, is indicative of the type of constraint imposed on biodiversity conservation in the UK. The UK universities and major taxonomic institutions also have a major

role to play in biodiversity conservation abroad, particularly in developing countries where it is crucial that taxonomic support is provided now in order to conserve global biodiversity.

2.7 The UK Government is considering its response to the recommendations set out in the House of Lords Select Committee Report, and it would be timely if the Joint Committee were to communicate its own views on the matter.

3. The Joint Committee is invited to:

- i. **comment** on the state of field lichenology in Scotland and the suggestions for action outlined in paragraph 5.2 above;
- ii. **affirm** to Government the Committee's support for recommendation 8 of the House of Lords Select Committee report, in particular, and **request** that the statutory conservation agencies be represented appropriately on a future body established to guide the future effort on taxonomy in the UK.

ANNEX 1 HOUSE OF LORDS COMMITTEE ON SCIENCE AND TECHNOLOGY - REPORT ON SYSTEMATIC BIOLOGY AND BIODIVERSITY

Summary of recommendations

1. In accordance with the recommendation of the Dainton Report, grant-in-aid funding should be increased to the level it would have been had the 1992 figures been maintained in line with inflation. This would allow further digitising of the collections.
2. That the Government consider providing support to systematics collections as part of a bigger project to support biological resource centres, as recently highlighted by the OECD.
3. That the Government develop and publish a clear, concise summary document regarding their policy on biodiversity conservation activity in the United Kingdom and on the international stage.
4. That the Higher Education Funding Councils should consider the role of the Research Assessment Exercise in the decline of systematic biology in universities and explore ways in which this subject, as they do with other minority disciplines.
5. That the BBSRC reconsider its decision not to award academic analogue status to Royal Botanic Gardens, Edinburgh and Kew.
6. That the systematic biology community, especially via the Systematics Association and the Linnean Society, should continue to increase efforts to demonstrate the relevance and importance of systematic biology. This should have the effect both of improving its profile to funding bodies and of making it more attractive to potential professional taxonomists and volunteers. We also hope that systematic biologists who are members of learned societies, such as the Institute of Biology and the Royal Society, will use their influence to promote the discipline.
7. That the United Kingdom should take the lead and propose to the Global Biodiversity Information Facility (GBIF) i) that the GBIF run a pilot with some priority species to form the basis of a trial of making taxonomy primarily digitised and web-based. A trial would demonstrate the benefits and pitfalls of this approach before implementing it more widely.

8. That DEFRA takes the lead in setting up a body with the express purpose of bringing together representatives from Government departments, ecologists and conservationists and the systematic biology community, including those based at museums, universities and other institutions. DEFRA should provide funding for administrative support in the early stages, although we envisage that the body should eventually seek to become self-financing with all participants making a small contribution to running costs the body's main remit would be to:

- i. identify priority areas of biodiversity for which taxonomic research is most needed by the conservation community, and for other national purposes, such as health and agriculture;

Additional remits would be to:

- ii. assess the taxonomic impediment to conservation action - specifically to analyse the shortage of taxonomic specialists and gaps in taxonomic data;
- iii. campaign for resources for taxonomists researching in those priority areas (paragraph 5.22).

9. The current level of spending on the Darwin Initiative, approximately £3 million per annum, should be earmarked specifically for projects with a significant taxonomic component, to be used for conservation purposes. This would be used to help build taxonomic capacity in developing countries and should include projects to digitise UK systematics collections. Any additional funds to the Darwin Initiative beyond this core could have a wider remit to include projects with a major focus on development issues or poverty alleviation.