

## Science Strategy 2024-2029

Since its inception, the BSBI has focussed on the scientific study of vascular plants, including their taxonomy and variation, biogeography, and ecology. Whilst these continue to be the primary focus of its work, its science remit has widened, most notably to support conservation and land management decision-making, for example through trend analyses (Pescott et al., 2019a), species prioritisation in the form of Red Lists (e.g. Stroh et al., 2014) and decision-support tools for land managers such as ‘botanical heatmaps’ (Walker et al., 2022). In addition, it has increasingly employed more structured recording to better reflect the changes taking place and the threats that many plants now face (e.g. Braithwaite et al., 2006; Walker et al., 2017; Pescott et al., 2019b).

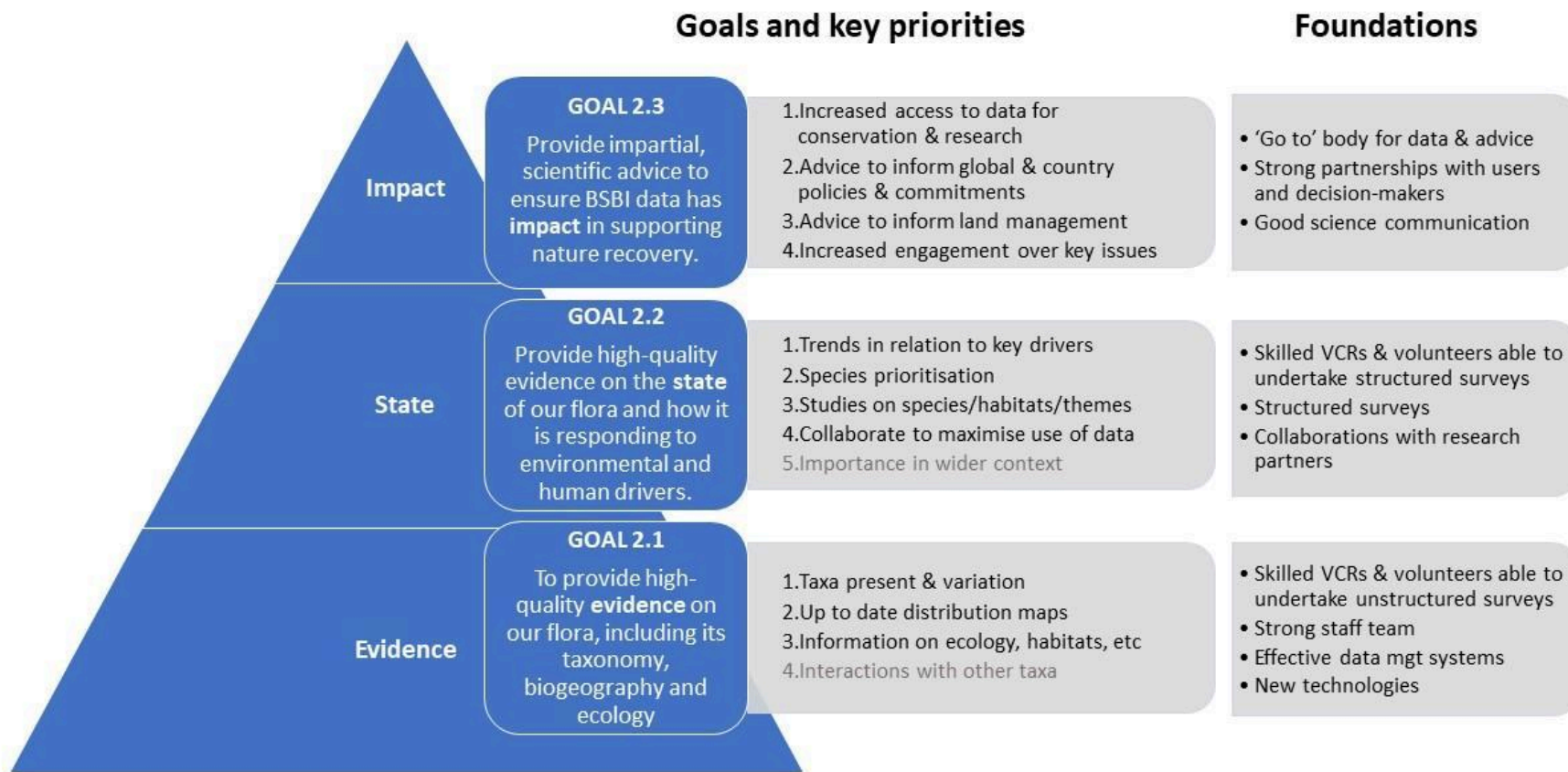
This shift in focus was captured in Goal 2 of the BSBI’s overall strategy published in 2021 which was “to provide high quality, impartial data and interpretation needed for research and to help tackle key environmental issues such as biodiversity loss and climate change.” This science strategy builds on Goal 2 and is numbered accordingly so it links to the overall Science Strategy goals. It sets out in more detail the priorities for the BSBI’s scientific work over the next five years (2024-2029). It has been developed in consultation with a range of individuals and organisations, including a one-day workshop to identify key science themes and an online consultation with BSBI members, recorders, and key partners. The findings of both consultations form the core of this strategy.

### Our strategic goals and priorities

Our science goals can be seen as a pyramid comprising **evidence**, **state**, and **impact** (Fig. 1):

- **Evidence** is the foundation of the pyramid as it informs everything BSBI does. These are the data that our expert vice-county recorders and volunteers collect on the taxonomy, distribution, and ecology of native and non-native plants, largely through unstructured surveys undertaken for county floras and national distribution atlases.
- **State** is the range of measures (metrics) that we derive from these data to tell us how our flora is changing (trends) and the challenges it is facing (drivers, pressures). As for other taxa, accurate information on state often relies on the findings of more structured surveys designed to address specific questions.
- **Impact** is placed at the apex of the pyramid as it is where information on evidence and state are used to influence and inform decision-making about our natural environment, in particular policies around land use (e.g. forestry, agriculture) and external factors such as climate change and pollution. To have impact, the BSBI needs to be well-known and trusted to provide the evidence needed for environmental decision- and policy making.

**BSBI Strategy GOAL 2:** To provide high quality, impartial data and interpretation needed for research and to help tackle key environmental issues such as biodiversity loss and climate change



**Figure 1.** Science Strategy map. Note that key priorities that are discretionary are given in grey text.

Each goal has three key priorities in terms of the work needed although it is important to stress that not all will take place within the 5-year period. Discretionary priorities are also included under each goal. These are projects that BSBI and its supporters consider desirable but of lesser priority.

We have defined a set of Foundations for each Goal which will underpin our strategy and ensure both our effectiveness and our long-term resilience. These are the activities, skills, technologies, or behaviours that are critical to success. Without them, it is unlikely that BSBI will be able to meet the goals it is setting itself for the next five years.

## **Goal 2.1. To provide high-quality evidence on the British and Irish flora, including its taxonomy, biogeography and ecology.**

### **Key priorities**

1. Keep track of the changing composition of the British and Irish flora considering taxonomic changes, variation, genetics, evolution, and the arrival of new species.
2. Keep track of the distributions of vascular plants growing in the wild in Britain and Ireland including their origins to allow accurate mapping of native and introduced ranges.
3. Improve our understanding of the ecology of British and Irish vascular plants, including their phenology and habitat requirements.

### **Discretionary**

4. Improve our understanding of the role plants play within ecosystems, including their interactions and dependencies with other biota (e.g. fungi, animals, insects, etc.) and ecosystem functions and services.

### **Foundations**

1. A well-motivated network of expert vice-county recorders and skilled volunteers able to undertake unstructured surveys at a variety of scales.
2. A strong staff team able to design, coordinate and analyse the results of surveys and support volunteers.
3. Effective online recording and data management systems.
4. Use of new technologies to improve data quality including remote sensing, eDNA, genetic analysis, image recognition, etc.

## **Goal 2.2. Provide high-quality evidence on the state of our flora and how it is responding to environmental and human drivers.**

### **Key priorities**

1. Using data from structured and unstructured surveys to quantify temporal trends for vascular plants in relation to key drivers, such as climate change, invasive non-native species (INNS), pollution, land management, conservation activities, and pests and pathogens.
2. Utilise our data to carry out periodic threat assessments, to underpin species prioritisation for conservation.

3. Undertake focussed studies on individual species, assemblages or habitats for monitoring purposes (e.g. populations of priority species on key sites) or to address specific issues (e.g. impacts of water quality on aquatic species).
4. Work with partners to maximise the use of our data through modelling and statistical analyses.

#### **Discretionary**

5. Assess the importance of British and Irish plant populations in a wider international context.

#### **Foundations**

1. A network of expert vice-county recorders and skilled volunteers able to undertake structured surveys at a variety of scales.
2. Structured surveys/schemes designed to reduce bias and provide reliable metrics.
3. Collaborations with research and other partners.

### **Goal 2.3. Provide impartial, scientific advice to ensure BSBI data has impact in supporting nature recovery.**

#### **Key priorities**

1. Being more proactive in showcasing BSBI science and data and making our data as widely available as possible for the benefit of plants in research, conservation, land management, and development control, ideally via online platforms such as National Biodiversity Network (NBN) Atlas and Global Biodiversity Information Facility (GBIF).
2. Provision of data and advice needed to inform the global environmental agreements (Global Biodiversity Framework, Global Strategy for Plant Conservation, COP) as well as UK, Ireland and country-level strategies, policies, and commitments.
3. Provision of data, advice and tools needed to inform conservation and land management decision-making, such as tree-planting, Biodiversity Net Gain, national nature recovery strategies and networks, agri-environment scheme targeting, ecological restoration, rewilding, species introductions, and seed sowing.
4. Provide a strong voice on key issues through increased engagement with other organisations & decision-makers.

#### **Foundations**

1. Strong presence and recognised as the 'first port of call' for vascular plants.
2. Strong partnerships with research bodies, other environmental NGOs, and statutory conservation bodies who require access to our data and expertise for strategic and operational activity.
3. A strong staff team able to communicate scientific findings in an accessible and relevant way.

## References

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