

BHUTAN BIODIVERSITY PORTAL: CITIZEN SCIENCE INITIATIVE IN BHUTAN

The Bhutan Biodiversity Portal (www.biodiversity.bt) is the first of its kind for South Asia - a pioneer initiative, established and guided by a consortium of major biodiversity stakeholders, with technical support from an external collaborator.

The project agreement was initiated under the framework of the UN Conference on Environment and Development (1992) in Rio de Janeiro. This agreement was formalised in 1994 and subsequent programmes led to the creation of the Bhutan Integrated Biodiversity Information System (BIBIS) in 2002. BIBIS was the product of a collaborative effort between many agencies and aimed to create a biodiversity information platform that was accessible to anyone interested in Bhutan's biological resources.

← The national flower of Bhutan, Blue Poppy (*Meconopsis galyioidiana*) was described in 2017 ©Rinchen Yangzom

A major challenge for Bhutan is access to reliable and up-to-date biodiversity information for effective conservation planning and sustainable use of natural resources. The Bhutan Biodiversity Portal, is the first initiative of its kind in South Asia, and was launched to address this issue. It is an open access, one-stop citizen science data repository for biodiversity information. The portal aims to aggregate biodiversity data recorded through citizen science, while facilitating a platform for the flow and discussion of biodiversity related information between scientific experts and amateurs alike, in order to promote biodiversity conservation within the community.



↑ An awareness workshop to the students of Samtse College of Education ©Danielle Northey

Bhutan is home to a recorded 11,248 species within all biodiversity taxa.



← Web interface of the Bhutan Biodiversity Portal (www.biodiversity.bt)

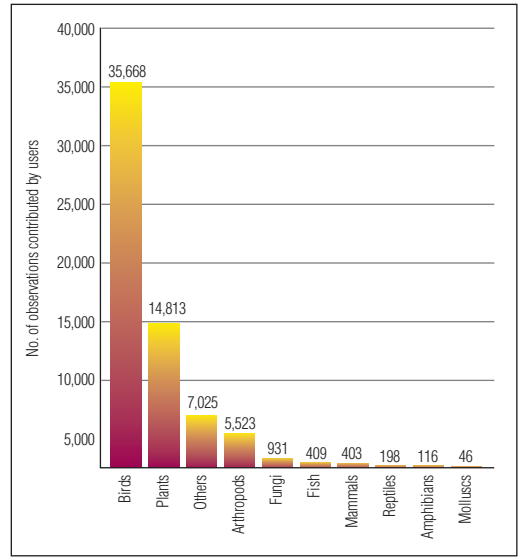
The country has 71% forest cover and 51.4% of that area is protected.

In 2008, BIBIS was upgraded to a web-based biodiversity portal and in 2011; it was further advanced to its present form: the Bhutan Biodiversity Portal (BBP), a national consortium-based, citizen science approach to documenting and managing biodiversity. Consortium members include the Royal University of Bhutan represented by the College of Natural Resources, Department of Forests and Park Services represented by Nature Conservation Division, and Ugyen Wangchuck Institute for Conservation and Environmental Research, Information, Communication and Technology Division of the Ministry of Agriculture and Forests, World Wide Fund for Nature – Bhutan; and the National Biodiversity Centre who act as the secretariat for the consortium. Technical support is provided by Strand Life Sciences in Bangalore, India.

Environmental conservation is one of four pillars of the Gross National Happiness philosophy in Bhutan and the portal encourages Bhutanese citizens to embrace their fundamental duty of protecting their natural environment and biodiversity, as enshrined in Article 5.1 of the Constitution of the Kingdom of Bhutan.

This citizen science initiative aims to promote and harness collective effort in generating and verifying content in a comprehensive, cost-effective and inclusive manner, thereby alleviating the monumental task of documenting the rich biodiversity of Bhutan. Additionally, having a consortium of different biodiversity stakeholders helps address the issue of duplicative efforts in developing and managing isolated information systems and databases around the country. Dickinson, Zuckerberg and Bonter (2010) suggest that this model of citizen science: the monitoring of biodiversity across large geographic regions has been highly influential in the field of ecology. They also argue that multiple species surveillance across an area has the potential to shed light on unexpected or counterintuitive trends that could provide a valuable trigger for more systematic, targeted ecological research.

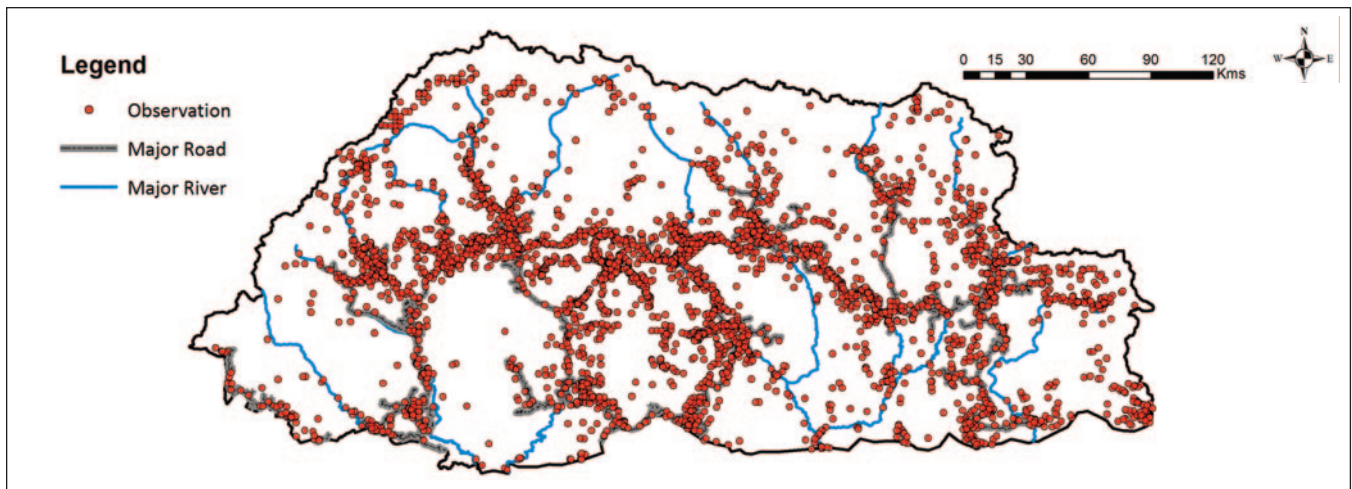
The BBP was officially launched in December 2013 and since then; it has been gaining momentum with steady increases in the numbers of observations and registered members. Currently, there are 1,692 registered users on the BBP and they have contributed a total of 65,151 observations, more than 200 documents and more than 20 datasets related to the country's biodiversity. All data on the portal are open-access and shared under the Creative Commons licensing system. The users upload observations of plant or animal species in the form of photos, video or audio files. They also specify the date and location of their observation and can request assistance from other members of the portal with species identification.



↑ Number of observations (by species group) contributed by registered users until August 2019



↑ *Gyalsey Emerald Spreadwing (Megalestes gyalsey) named after His Royal Highness the Gyalsey (Crown Prince) of Bhutan in 2017 ©Albert Orr*



The portal contains a wide range of reference material such as species information (the curated and detailed description of individual species found in Bhutan); maps (spatial information such as roads, settlements, Important Bird Areas which can be layered and viewed through an interactive user-interface); datasets of specific taxonomic groups, for example a species checklist of fish species found in Bhutan; as well as journal articles and other literature related to local biodiversity.

Promotion of the portal has included awareness raising workshops and seminars, such as Bioblitzes, e-newsletters, print and broadcast media, magazines, audio-visual user manuals, training courses, and social media. In addition, individual Bioblitz campaigns were also launched such as the “Wild River Bioblitz” in April and the “Busy Butterfly Bioblitz” in June. Through user analysis conducted in 2018, the main reasons/responses as to why people were motivated to use the BBP were:

- a. “I want to learn more about the biodiversity of Bhutan”
- b. “Interest in nature conservation”
- c. “I want to contribute to the biodiversity index of the country”
- d. “I want to help with species identification”

The development and management of the portal has however included some challenges. With a continual inflow of data and limited taxonomic expertise for some groups, bottlenecks can form. Alongside funding data, curation remains a major challenge. Technical support, which includes troubleshooting and upgrades is also a challenge for Bhutan particularly due to limited human resources available.

The BBP helps to showcase the high levels of biodiversity found in Bhutan. The country occupies a modest area of 38,394 km² but has 71% forest cover and as of 2017, is home to a recorded 11,248 species within all biodiversity taxa. In the last decade, at least 33 species new to science have been discovered in Bhutan, including a dragonfly species named after the Crown Prince of Bhutan (His Royal Highness the Gyalsey) and the national flower of Bhutan, the blue poppy (*Mecconopsis gakyidiana*) which was described in 2017. The largest known kingdom, Plantae, consists of an astounding 4,567 species of vascular plants in addition to numerous other species of flora (NBC 2019). However, currently, the most documented species groups in the portal are birds followed by plants.

A primary objective of this portal is its accessibility to all sections of society: students, researchers, policy makers, conservationists, amateur naturalists, tourism operators and anybody with an interest in Bhutan’s flora and fauna. Our collective efforts will ensure that we (a) understand and appreciate our rich biodiversity, (b) translate this understanding into effective conservation and sustainable use, and (c) respect the principle of inter-generational equity and our sacred duty as custodians to uphold, protect and deliver intact our ‘green heritage’ to future generations.

↑ *Distributional map of observations contributed by registered users until August 2019*

A pioneer initiative; the first of its kind in South Asia. The portal encourages Bhutanese citizens to embrace their fundamental duty of protecting their natural environment and biodiversity.

REFERENCES

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