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Biodiversity Statistics of Bhutan 2017

A Preliminary Baseline



National Biodiversity Centre
Ministry of Agriculture and Forests



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Preface

This publication, *Biodiversity Statistics of Bhutan 2017: A Preliminary Baseline* is the first of its kind in the country and is an outcome of the collaborative effort of various biodiversity stakeholders within and outside the Ministry to record the statistics of all biodiversity groups found in Bhutan. While certain taxonomic groups in Bhutan have been well studied, many other groups such as invertebrates and bryophytes remain poorly documented, highlighting the need to strengthen the status of biodiversity information in the country for policy guidance, informed decision-making and the implementation of successful conservation plans for Bhutan's flora and fauna.

Biodiversity Statistics of Bhutan 2017: A Preliminary Baseline will provide readers accurate and updated information on the status of biodiversity in the country. It records for the first time, a total of 11,248 species in Bhutan, which is around 0.8% of the total biodiversity in the world. It is presented here by taxonomic classification, in graphical and tabular forms. This report is expected to be published annually, in order to keep track of trends in the number of species as well as new records and discoveries that are made in Bhutan.

I hope that this publication is a useful resource for a wide audience with an interest in Bhutan's natural heritage namely environmental conservationists, academics, students, tourism operators, and the general public. I also hope that this publication will strengthen the process of understanding more accurately the status of our biodiversity and engender support for biodiversity conservation in the country.

Dr. Tashi Yangzome Dorji
Program Director
National Biodiversity Centre
May, 2019

Executive Summary

Bhutan is known to the outside world as a country with rich biodiversity. Despite this fact, Bhutan still lacks a compendium of statistics describing this biodiversity. Consequently, at times, inaccurate, partial, or outdated information gets disseminated. This and future ‘Biodiversity Statistics of Bhutan’ publications thus aim to keep track of and record the number of species found in Bhutan, as well as the trends in abundance and distribution of species over time.

The primary focus of the Biodiversity Statistics of Bhutan publication is to collate and create an accurate and reliable baseline of biodiversity statistics for the country. This publication is the first of its kind, developed through collaborative efforts involving various institutions and by bringing together stakeholders with wide-ranging expertise and knowledge from different sources.

This publication presents species numbers according to taxonomic groups, trends of new records and discoveries, as well as other information related to the biodiversity of Bhutan. It provides checklists according to taxonomic classifications which have also been made available through an online consortium-based platform: the Bhutan Biodiversity Portal (www.biodiversity.bt).

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Plate 1. Endangered Red Panda (*Ailurus fulgens*) is native to the Himalaya (© TCB)

Introduction to the Biodiversity Statistics of Bhutan

Background and objectives

Bhutan is located in the eastern Himalayas, with an area of 38,394 km², bordering China to the north and India to the south, east and west (NBSAP 2014). The country has 70.46 % forest cover (LCMP 2010). The lowest elevation is at around 100 metres above sea level (masl) in southern Bhutan, and the highest peak, Gangkhar Phuensum, rises to 7,570 masl. Most research has focused on three taxonomic groups: mammals, birds, and plants. The most bio-diverse groups by far are the invertebrate groups, including taxa such as molluscs, dragonflies and damselflies, beetles, bees and wasps, true flies, moths and butterflies. However, these groups remain largely unstudied. Some research on certain taxonomic groups has been initiated, for example on fungi, fishes, amphibians and reptiles (Gyeltshen et al. 2017, Gurung et al. 2013, Wangyal 2013, Mata et al. 2010), while research on other taxonomic groups is very limited and thus lack baseline data.

The main objective of this publication is to develop a preliminary report on the biodiversity statistics of Bhutan upon validation from data providers, and to create biodiversity statistics baselines for the country. It also aims to provide up-to-date species checklists annually, by keeping track of new species records and discoveries in Bhutan. Additionally, this report provides a reliable reference point for scientists, researchers, civil servants and citizens interested in the country's biodiversity.

As of 2017, a total of 11,248 species within all biodiversity taxa have been recorded in Bhutan. Of this, 5,114 species belong to Animalia, 5,369 species to Plantae, 690 to Fungi, 55 to Chromista, 18 species to Eubacteria, two species to Protista, and there are no records for Archaeobacteria.

Currently, there are 55 species of agricultural plants and eight livestock species. There are several varieties and land races of agricultural plants and traditional breeds of livestock, of which some are uncharacterized. This section will be expanded with details of crop and livestock diversity in the next version of this publication.

Globally, obtaining an accurate number is constrained by the fact that most species are either undescribed or undiscovered. Mora et al. (2011) predicts the existence of around 8.7 million (± 1.3 million) species within all the kingdoms on earth. The study also states that 86% of species on earth and 91% in the ocean still await description. More than one million species in the kingdom Animalia, more than 17,000 in Chromista, more than 44,000 in Fungi, more than 224,000 in Plantae, more than 11,000 in Bacteria, and more than 500 in the kingdom Archaeobacteria are catalogued around the globe, providing a cumulative estimate of more than 1,430,000 species within all kingdoms (Mora et al. 2011).

Methodology

As a first step, a range of taxonomic experts from various institutions in Bhutan were requested to provide species checklists for the different taxonomic groups. The first national stakeholders meeting on biodiversity statistics was held in December 2016 in Thimphu to initiate the data identification and collation process. During the meeting and in the following months, data was collected from numerous government agencies, colleges, individual researchers, NGOs, journal articles, databases, specimens, theses, and other publications. Species data was obtained from publications by the National Biodiversity Centre (NBC), Sherubtse College, College of Natural Resources (CNR), Naturalis Biodiversity Center (The Netherlands), Ugyen Wangchuck Institute for Conservation and Environmental Research (UWICER), Department of Forests and Park Services (DoFPs), National Plant Protection Centre (NPPC), and journal articles (Gittenberger et al. 2017a, 2017b, Gyeltshen et al. 2017a, Dorji et al. 2017, Yoshida, Yangzom & Long. 2017, Dalstrom et al. 2017). Additional information on species data was obtained from the Bhutan Biodiversity Portal, National Herbarium, and the National Invertebrate Repository Centre at the National Biodiversity Centre in Thimphu.

These checklists were then collated and cross-checked against different reliable websites including GBIF, APNI, COL, IUCN and BirdLife and other national databases to ensure scientific accuracy in nomenclature and classifications. They were also further discussed with groups of taxonomic experts in order to validate the data and confirm agreement between different experts in Bhutan.

This publication presents data collected until December 2017. It largely follows taxonomic classification in accordance with different group classification systems, for instance, floral classification follows Flora of Bhutan (1983-2002), bird follows Inskipp et al. (1996), fungi follows MycoBank Database, and mammal classification follows International Code of Zoological Nomenclature (ICZN). Species rediscoveries are not taken into account in this publication due to lack of information and assessment.

Limitations

During the development of checklists, including those for new records and discoveries, some data may have been overlooked due to lack of access to scientific publications. This report only documents records from peer-reviewed publications, government documents, theses, books, and institutional databases accessible to the authors. In addition, species records from media such as newspapers, television, social media, anecdotes, and non-scientific publications have not been presented here.

Species Diversity of Bhutan

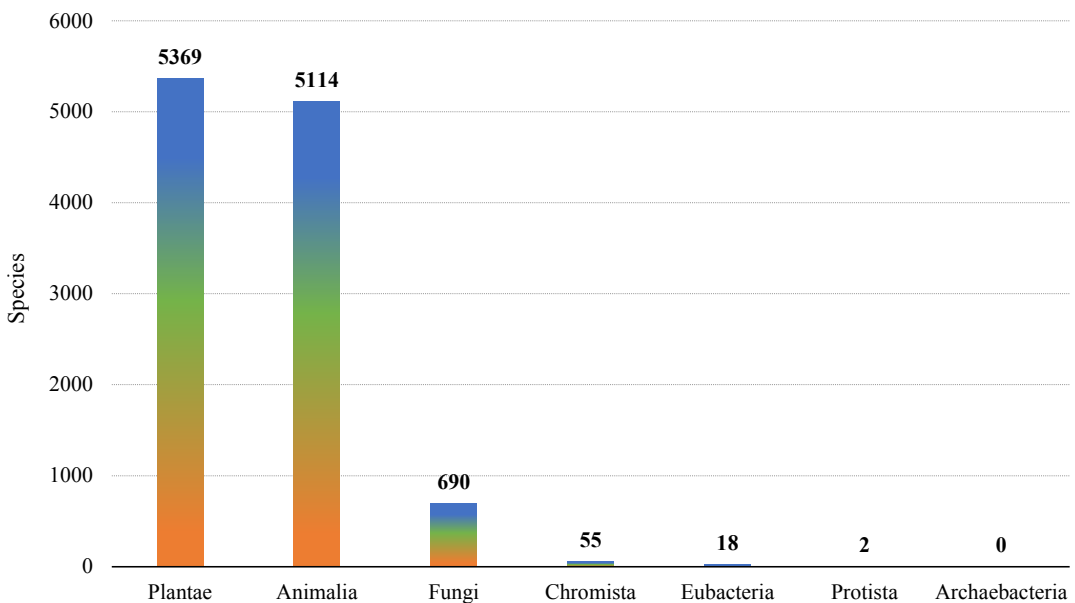
Currently, Bhutan is home to 11,248 known species from the following kingdoms: Animalia, Plantae, Chromista, Eubacteria, Fungi, and Protista. The two largest known kingdoms are Plantae and Animalia, which together account for 93% of all species. The smallest kingdom is Protista, which accounts for only two species (less than 1% of all species). However, the kingdoms Chromista, Eubacteria, and Protista are severely underexplored and much research is required in order to gain a better understanding of the number and diversity of species within these groups. Currently, there is no record of even a single species in the kingdom Archaeobacteria.

Number of species

Kingdom	Number	Percentage (%)
Animalia	5114	45.47
Plantae	5369	47.73
Chromista	55	0.49
Eubacteria	18	0.16
Fungi	690	6.13
Protista	2	0.02
Archaeobacteria	0	0
Total	11248	100

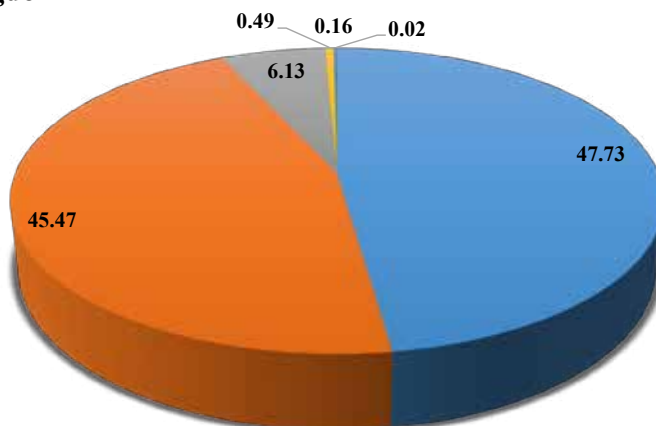
(Unit: Species, %)

Number of species by kingdom



Percentage of species by kingdom

Kingdom	%
Animalia	45.47
Plantae	47.73
Fungi	6.13
Chromista	0.49
Eubacteria	0.16
Protista	0.02

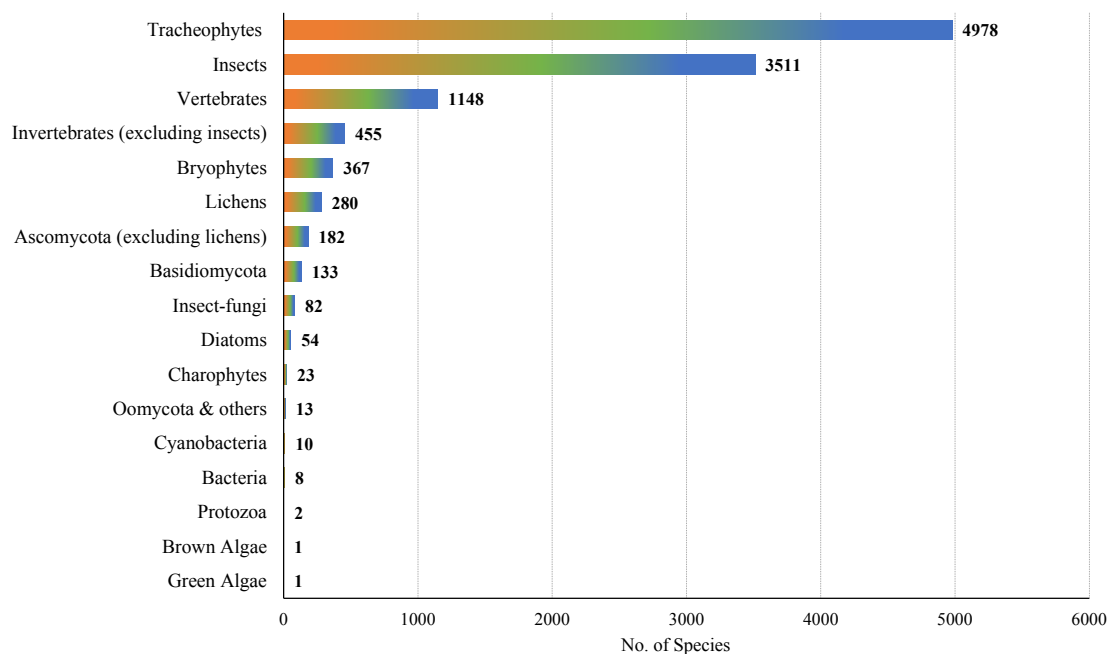


Number of species by taxonomic classification

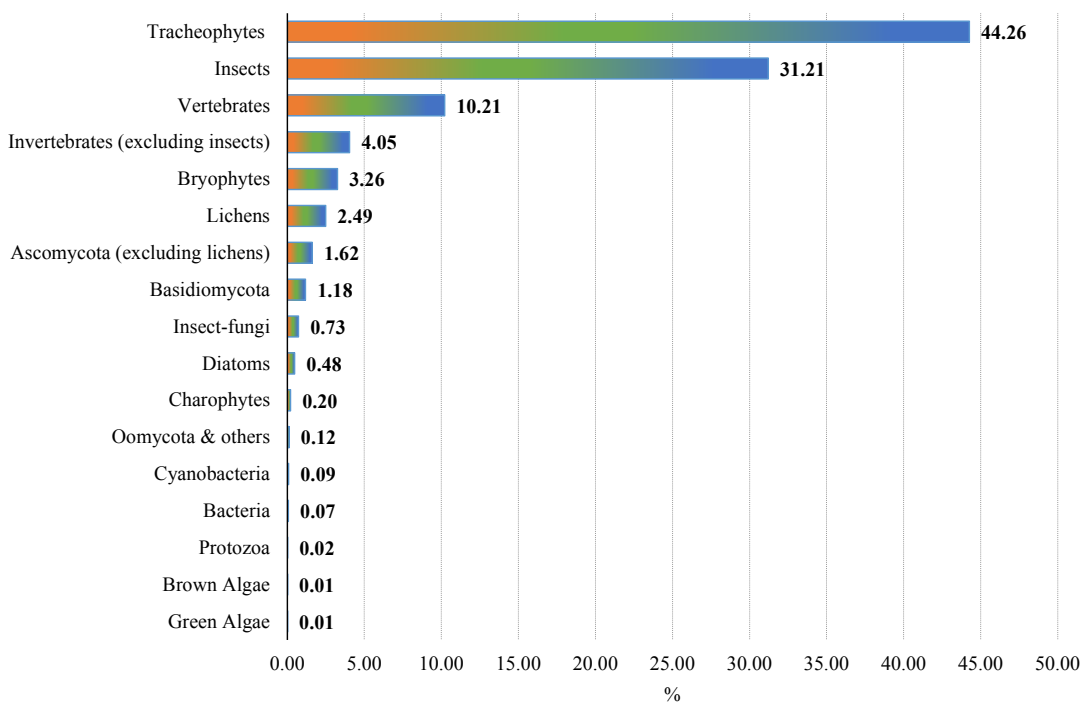
Kingdom	Classification	Number	Percentage
Animalia	Vertebrates	1148	10.21
	Invertebrates (excluding insects)	455	4.05
	Insects	3511	31.21
	Subtotal	5114	45.47
Plantae	Tracheophytes (Seed Plants & Ferns)	4978	44.26
	Bryophytes (Mosses, Liverworts & Hornworts)	367	3.26
	Charophytes (Algae)	23	0.20
	Green Algae	1	0.01
	Subtotal	5369	47.73
Chromista	Diatoms (Freshwater Algae)	54	0.48
	Brown Algae (Freshwater Algae)	1	0.01
	Subtotal	55	0.49
Fungi	Insect-fungi	82	0.73
	Basidiomycota	133	1.18
	Ascomycota (excluding lichens & insect-fungi)	182	1.62
	Oomycota & others	13	0.12
	Lichens	280	2.49
	Subtotal	690	6.13
Protista	Protozoa	2	0.02
	Subtotal	2	0.02
Eubacteria	Cyanobacteria	10	0.09
	Bacteria	8	0.07
	Subtotal	18	0.16
Total		11,248	100.00

(Unit: Species, %)

Number of species



Percentage of species



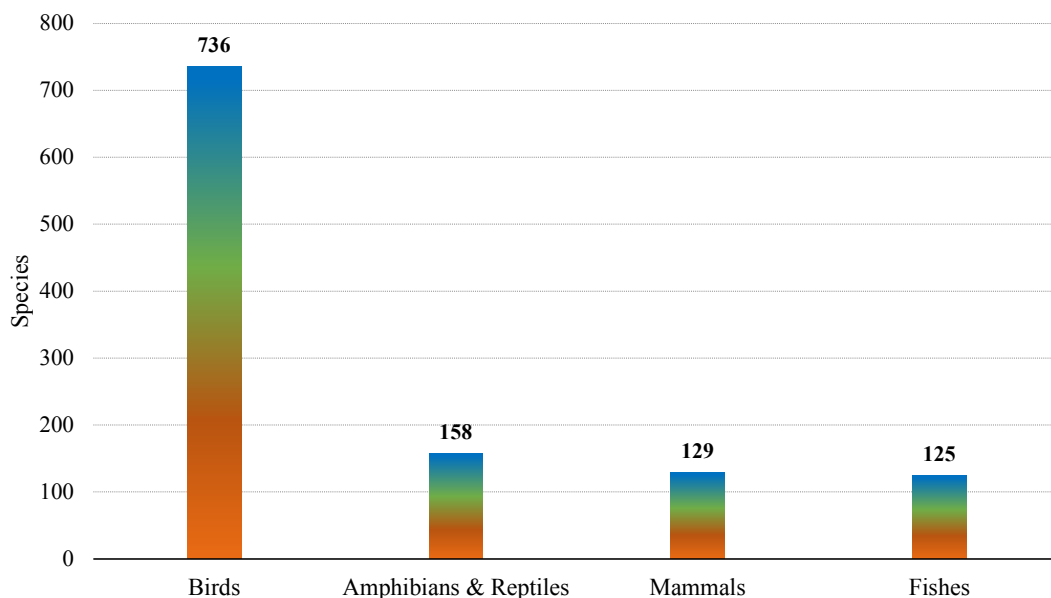
Kingdom Animalia

1. Vertebrates

Classification	Number	Percentage
Mammals	129	11.24
Birds	736	64.11
Amphibians & Reptiles	158	13.76
Fishes	125	10.89
Total	1148	100

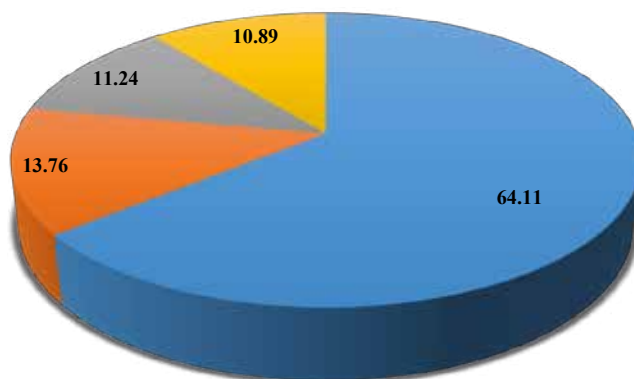
(Unit: Species, %)

Number of species



Percentage of species

Classification	%
Birds	64.11
Amphibians & Reptiles	13.76
Mammals	11.24
Fishes	10.89



2. Invertebrates (excluding insects)

Classification	Number	Percentage
Crabs (Arthropoda)	15	3.30
Spiders (Arthropoda)	155	34.07
Psocoptera (Euarthropoda)	191	41.98
Mites (Arthropoda)	27	5.93
Snails & Slugs (Mollusca)	61	13.41
Nematodes	6	1.32
Total	455	100

(Unit: Species, %)

Number of species

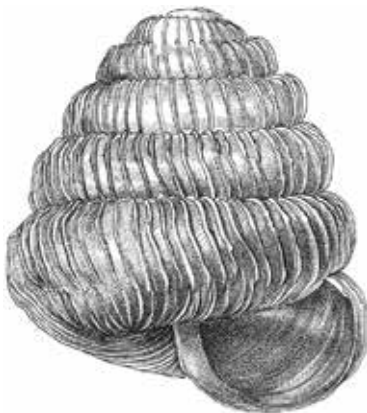
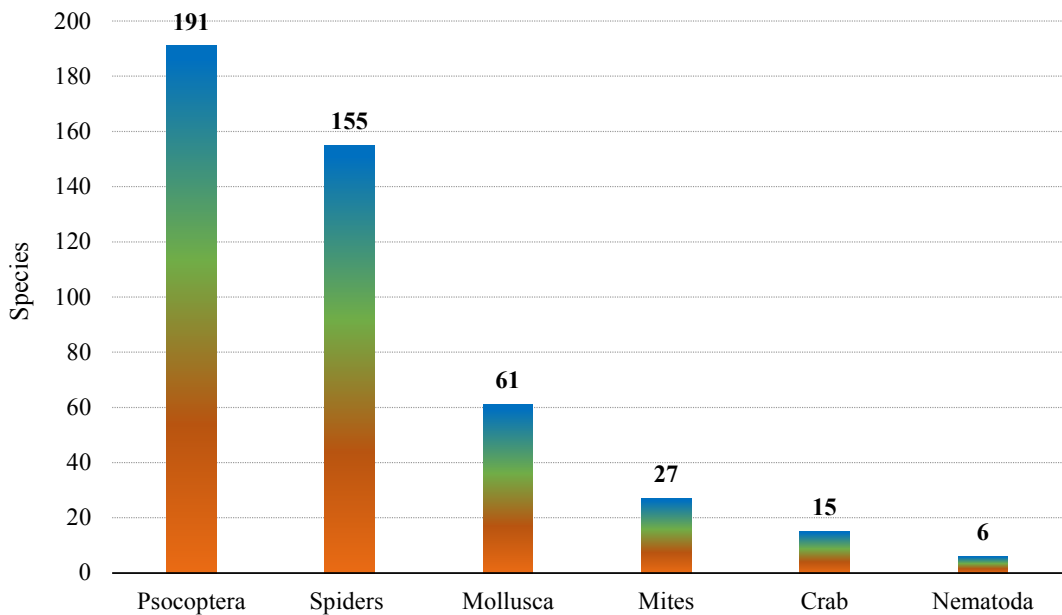


Plate 2. *Rahula kleini* (© NBC)

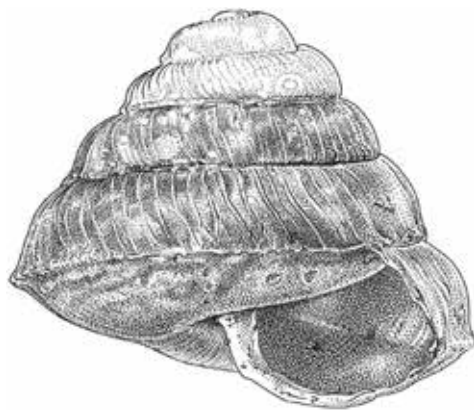
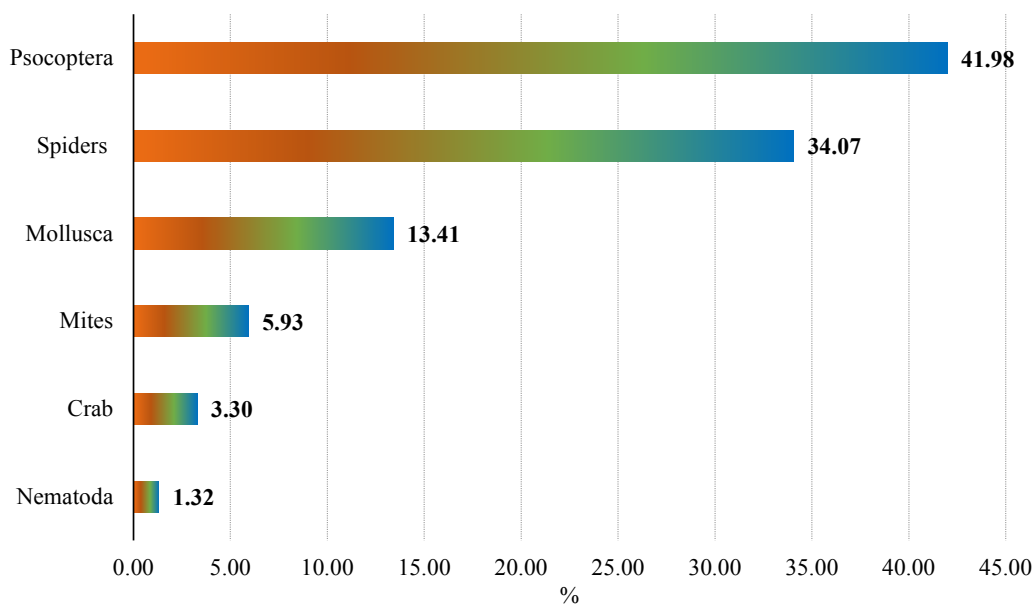


Plate 3. *Rahula trongsensis* (© NBC)

Percentage of species

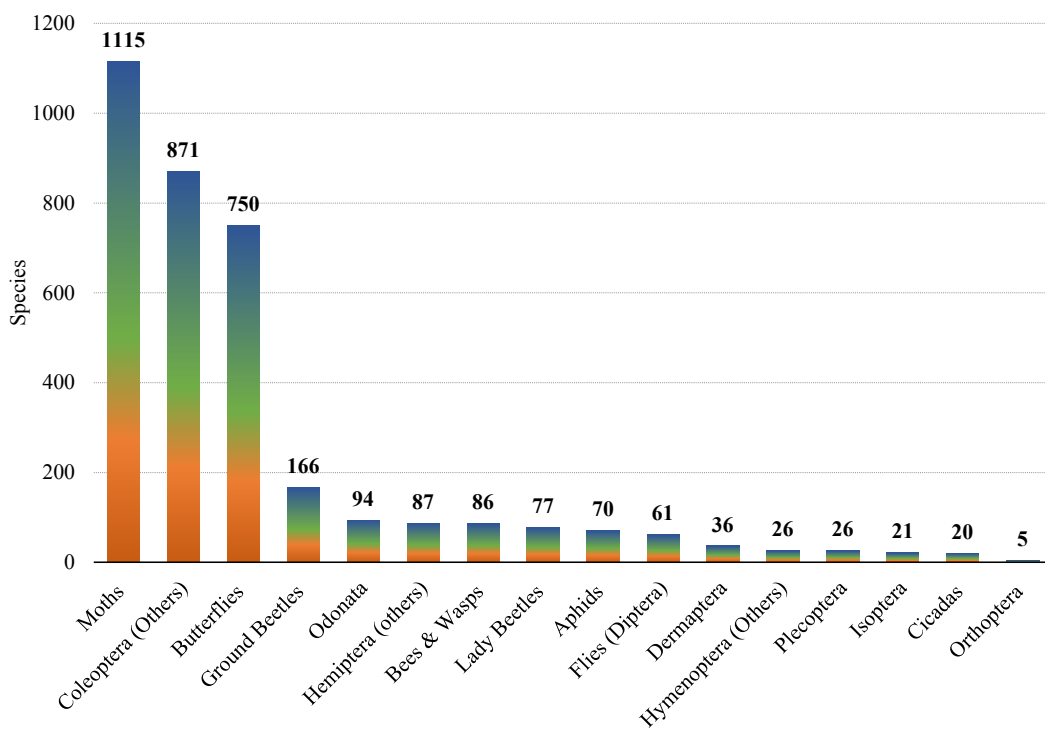


3. Insects

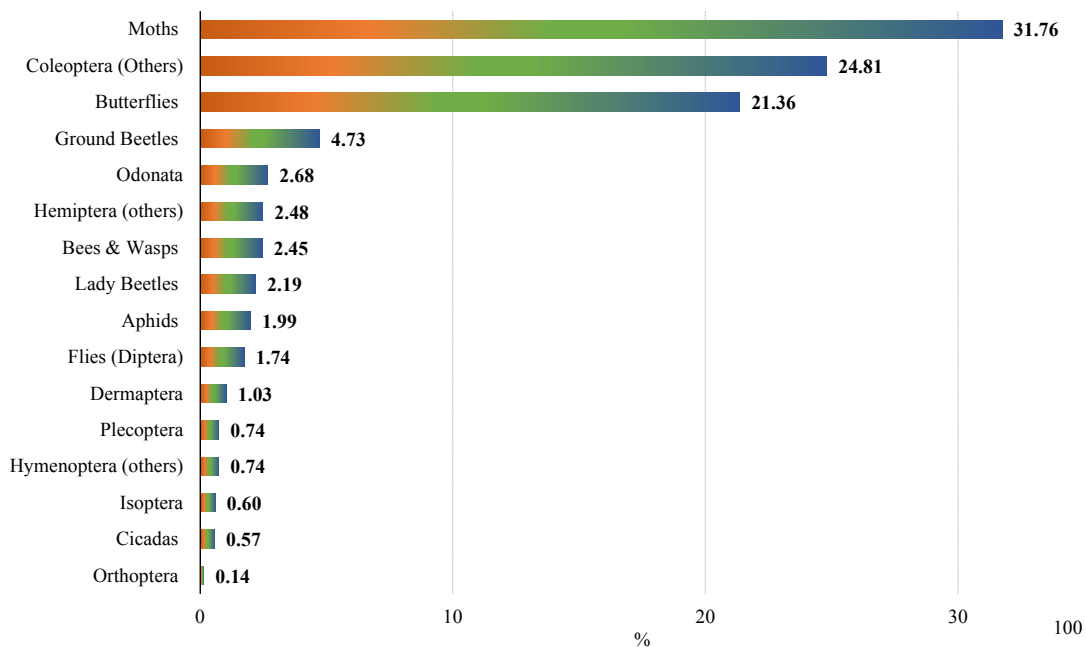
Classification	Number	Percentage
Butterflies (Lepidoptera)	750	21.36
Dragonflies & Damselflies (Odonata)	94	2.68
Dermaptera (Arthropoda)	36	1.03
Moths (Lepidoptera)	1115	31.76
Lady beetles (Coleoptera)	77	2.19
Ground beetles (Coleoptera)	166	4.73
Coleoptera (Others)	871	24.81
Bees & Wasps (Hymenoptera)	86	2.45
Hymenoptera (Others)	26	0.74
Plecoptera	26	0.74
Flies (Diptera)	61	1.74
Cicadas (Hemiptera)	20	0.57
Aphids (Hemiptera)	70	1.99
Hemiptera (others)	87	2.48
Isoptera (Arthropoda)	21	0.60
Orthoptera (Arthropoda)	5	0.14
Total	3511	100

(Unit: Species, %)

Number of species



Percentage of species

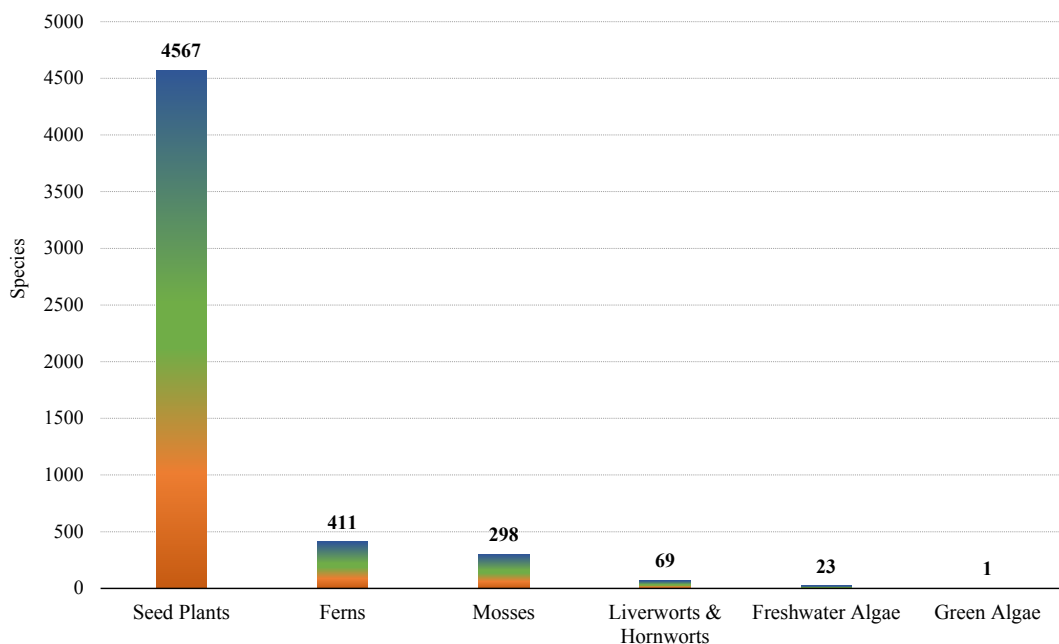


Kingdom Plantae

Classification	Number	Percentage
Seed Plants	4567	85.06
Ferns (Pteridophytes)	411	7.66
Liverworts & Hornworts (Bryophytes)	69	1.29
Mosses (Bryophytes)	298	5.55
Freshwater Algae (Charophytes)	23	0.43
Green Algae	1	0.02
Total	5369	100

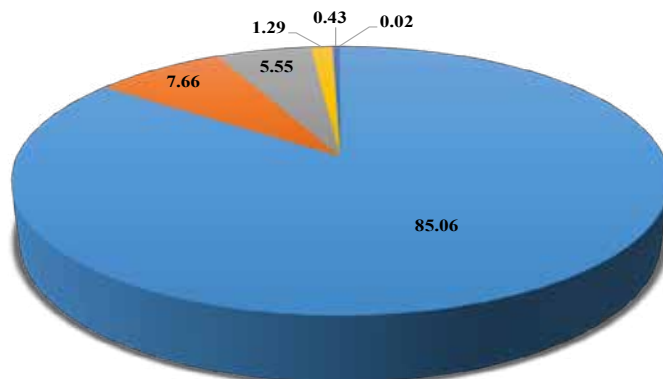
(Unit: Species, %)

Number of species



Percentage of species

Classification	%
Seed Plants	85.06
Ferns	7.66
Mosses	5.55
Liverworts & Hornworts	1.29
Freshwater Algae	0.43
Green Algae	0.02

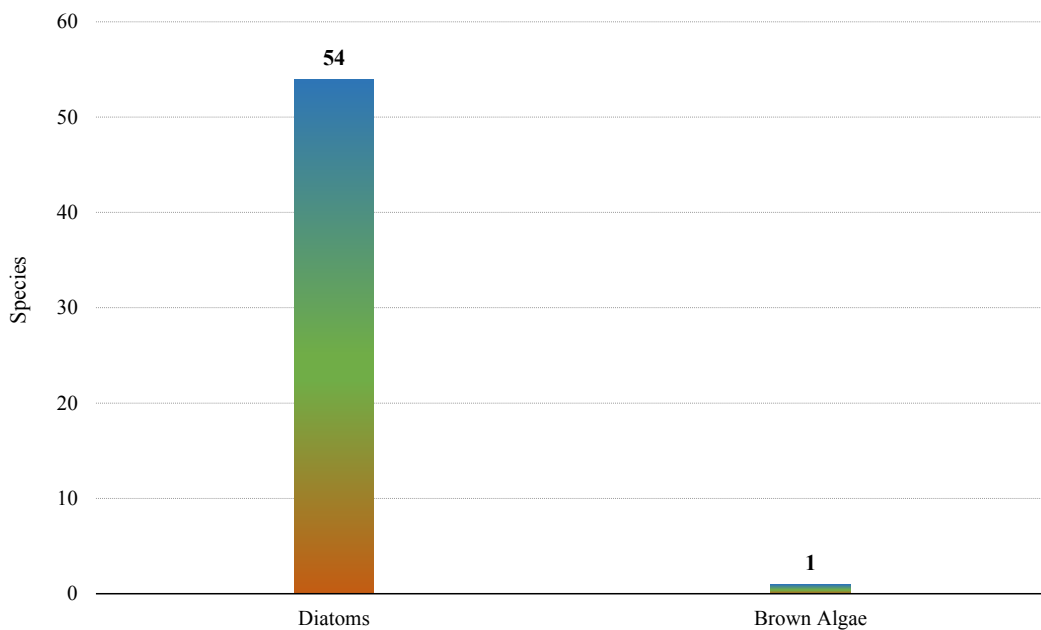


Kingdom Chromista

Classification	Number	Percentage
Diatoms	54	98.18
Brown Algae	1	1.82
Total	55	100

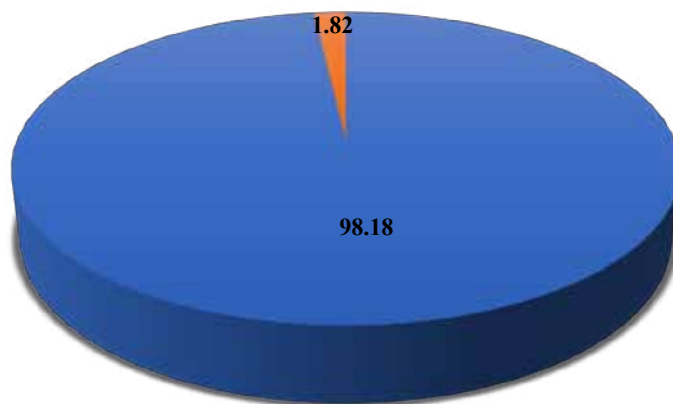
(Unit: Species, %)

Number of species



Percentage of species

Classification	%
Diatoms	98.18
Brown Algae	1.82



Kingdom Fungi

Classification	Number	Percentage
Ascomycota - Lichens & lichenicolous fungus	280	40.58
Ascomycota (excluding lichens & insect-fungus)	182	26.38
Basidiomycota	133	19.28
Ascomycota - Insect-fungus	82	11.88
Oomycota & others	13	1.88
Total	690	100

(Unit: Species, %)

Classification	Number	Percentage
Fungus	410	59.42
Lichens	280	40.58
Total	690	100

(Unit: Species, %)

Number of species

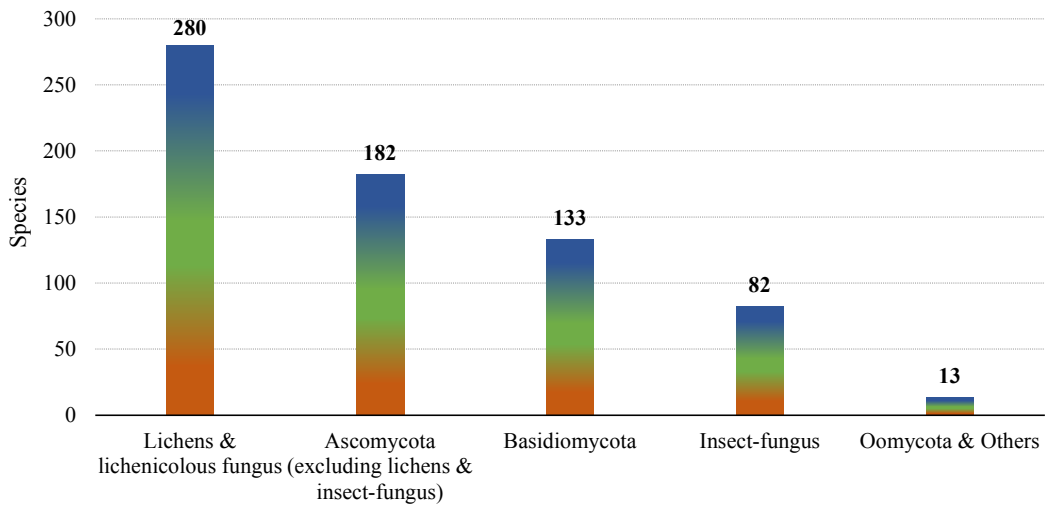
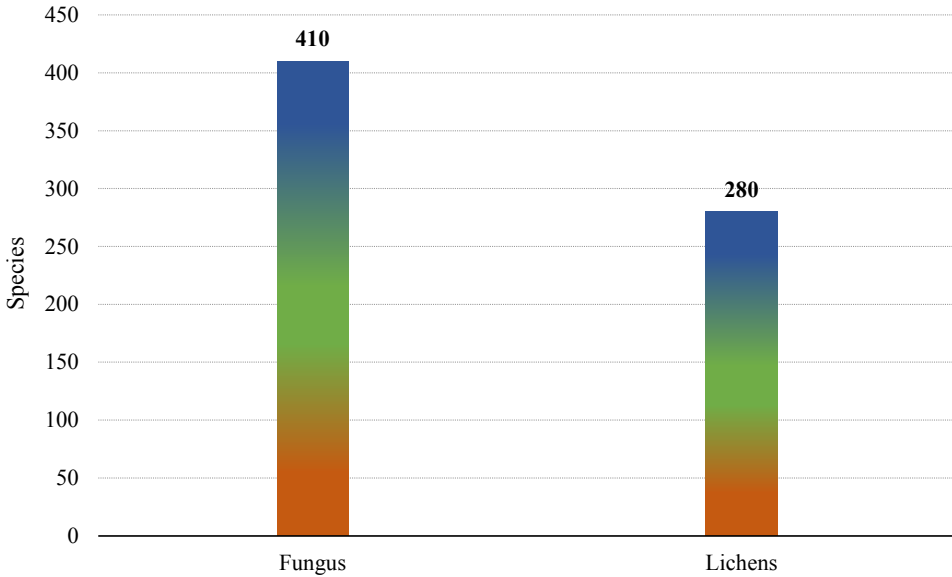


Plate 4. *Dictyophora cf. indusiata* (© Sabitra Pradhan)



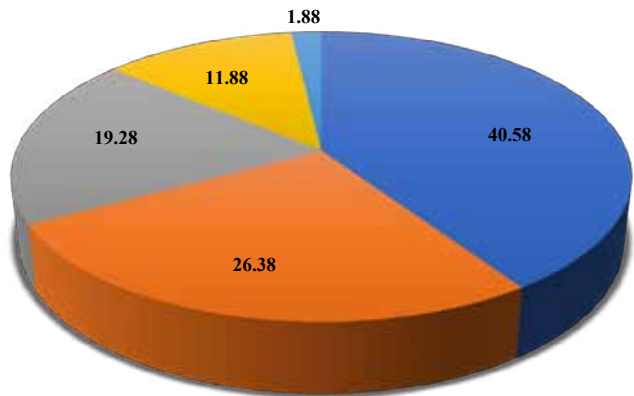
Plate 5. *Boletus cf. reticulatus* (© Sabitra Pradhan)

Number of species: fungus and lichens



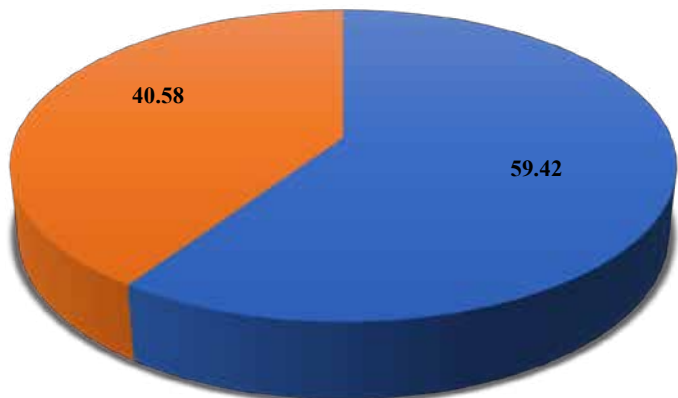
Percentage of species

Classification	%
Basidiomycota	19.28
Ascomycota (excluding lichens & insect-fungus)	26.38
Ascomycota - Lichens & Lichenicolous fungus	40.58
Insect-fungus	11.88
Oomycota & others	1.88



Percentage of species: fungus and lichens

Classification	%
Fungus	59.42
Lichens	40.58

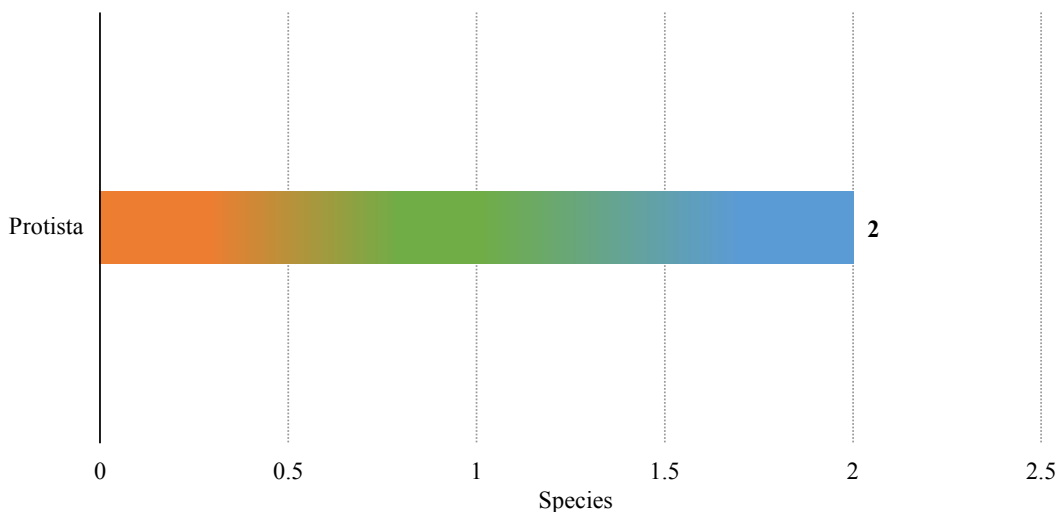


Kingdom Protista

Classification	Number	Percentage
Protozoa	2	100
Total	2	100

(Unit: Species, %)

Number of species



Kingdom Archaeobacteria

Classification	Number	Percentage
Archaeobacteria	0	0
Total	0	0

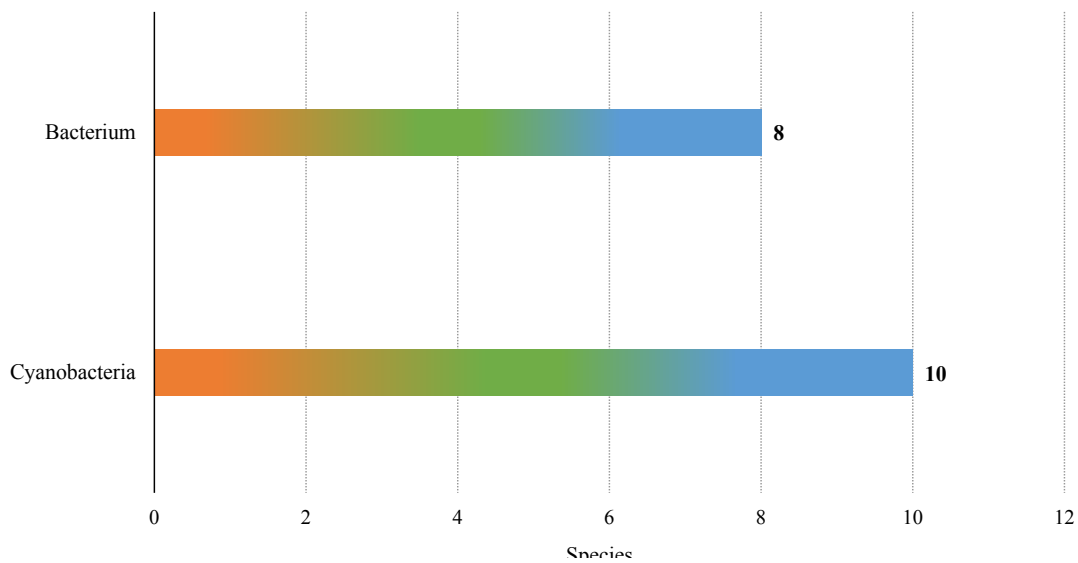
(Unit: Species, %)

Kingdom Eubacteria

Classification	Number	Percentage
Cyanobacteria	10	55.56
Bacterium	8	44.44
Total	18	100

(Unit: Species, %)

Number of species



Percentage of species

Classification	%
Cyanobacteria	55.56
Bacterium	44.44

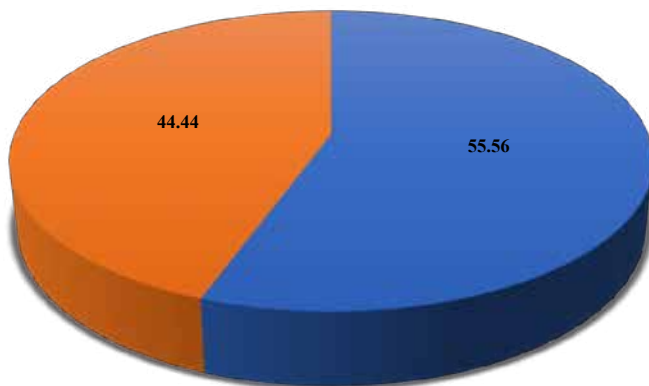


Plate 6. *Megalestes gyalsey* (© Albert Orr)



Plate 7. *Archaeoattacus edwardsii* (© Karma Wangdi)



Plate 8. *Meconopsis bhutanica* (©Yasuko Suda)

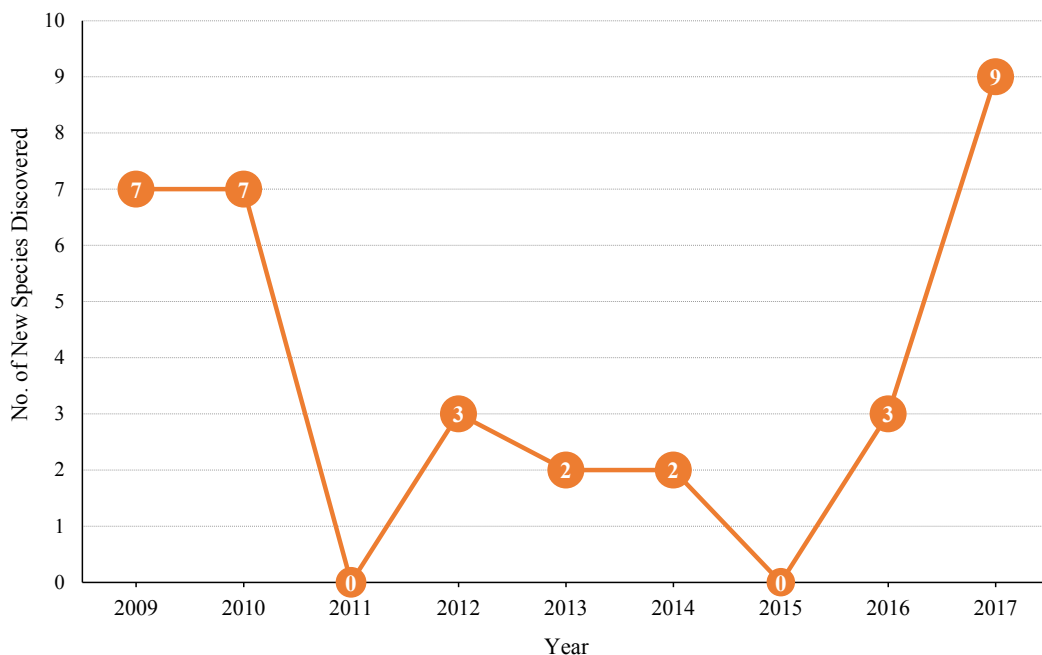
New Species Discoveries and New Records to Bhutan (2009 - 2017)

New species discoveries and records

The number of new species records and discoveries is expected to increase, as many of the less accessible areas in the country, which are suspected to have high levels of biodiversity, are yet to be researched. This assumption is further substantiated by the fact that a number of new species have been described and new records have been found in Bhutan over the years, despite very limited taxonomic works.

Between 2009 and 2017, at least 33 species new to science were discovered from Bhutan. The new discoveries include: 16 species of plants; four moths; four molluscs; one dragonfly; three fishes; one stonefly; and two beetle species. The new species discoveries have occurred at a rate of three species per year (3.6%). A total of 566 species of flora and fauna, new to Bhutan, were recorded from 2009 to 2017 (Gyeltshen et. al., 2018). Checklists of new discoveries and new records of species from 2009-2017 is provided (Table 1 & Annex. 1), based on information available to authors. Not all new records and discoveries may have been presented due to lack of access to scientific publications.

Number of new species discovered by year



Number of new species discovered by taxonomic classification

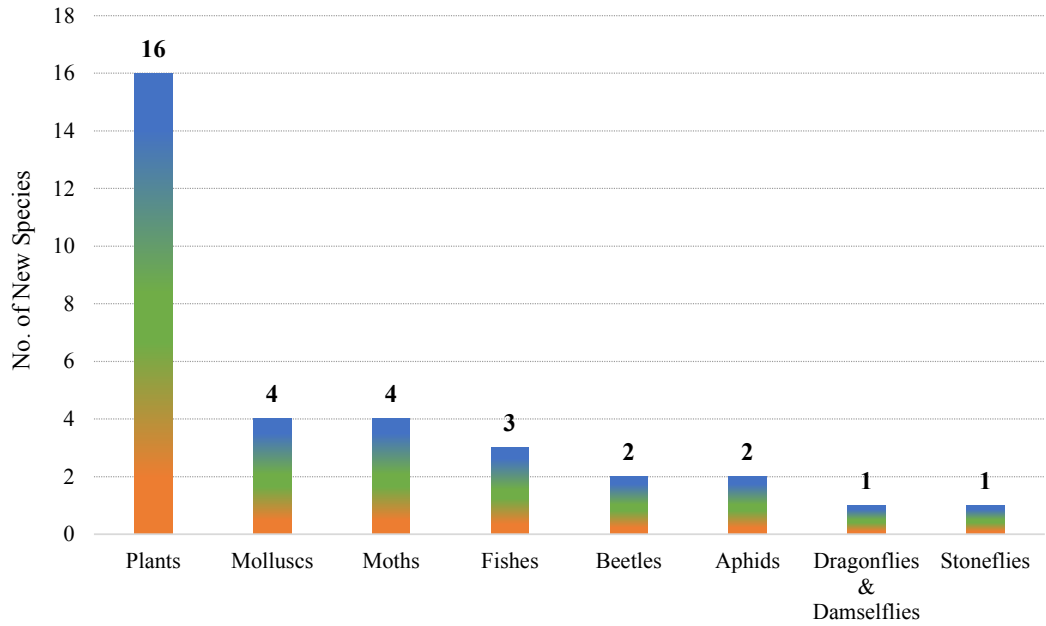


Plate 9. *Meconopsis gakyidiana* (©Rinchen Yangzom).



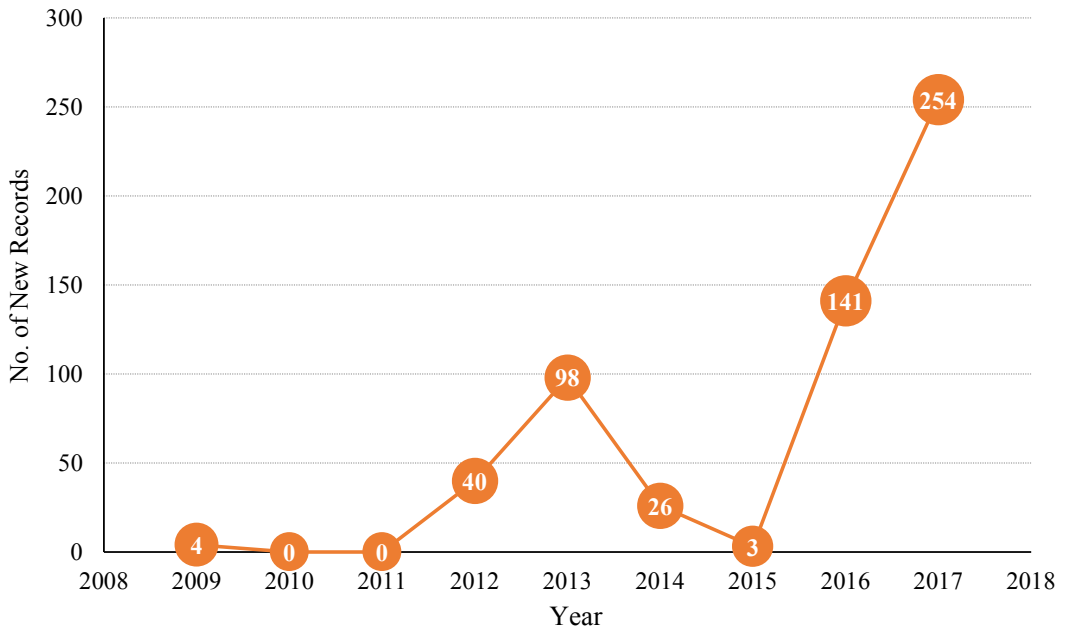
Plate 10. *Meconopsis merakensis* (©Rinchen Yangzom)

List of new species discovered by taxonomic classification

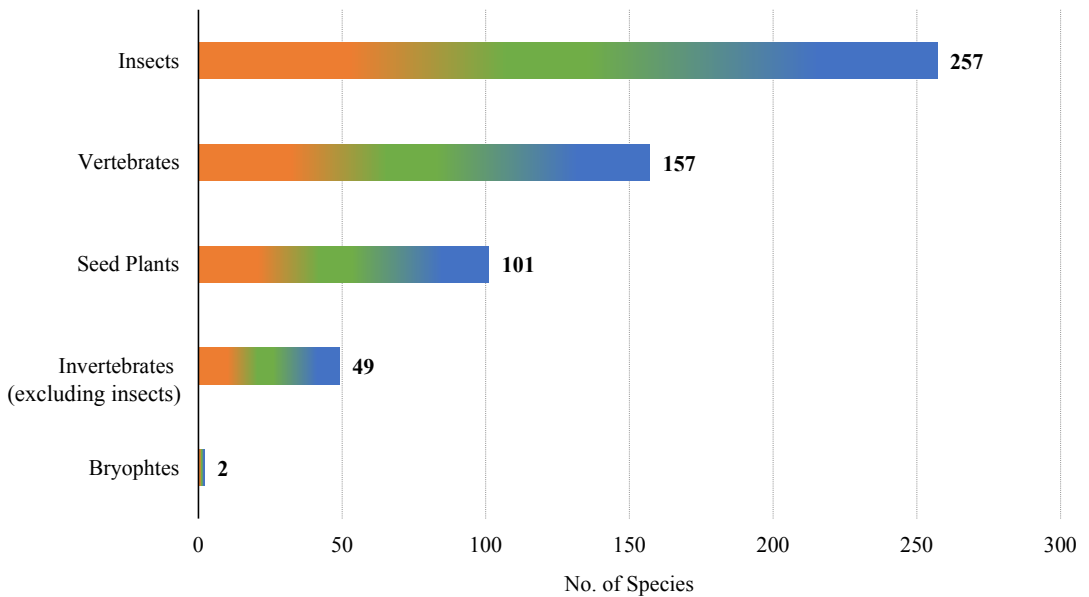
S.N.	Groups	Species	Author (s)	Year
1	Plants	<i>Roscoeia megalantha</i>	T. Yoshida, R. Yangzom & M. F. Newman	2017
2		<i>Meconopsis elongata</i>	T. Yoshida, R. Yangzom & D. G. Long	2016
3		<i>Meconopsis gakyidiana</i>	T. Yoshida, R. Yangzom & D. G. Long	2017
4		<i>Meconopsis merakensis</i>	T. Yoshida, R. Yangzom & D. G. Long	2017
5		<i>Meconopsis bhutanica</i>	T. Yoshida & Grey-Wilson	2012
6		<i>Spathoglottis jetsuniae</i>	N. Gyeltshen, K. Tobgyel & S. Dalstrom	2017
7		<i>Cotoneaster bumthangensis</i>	J. Fryer & B. Hylmo	2009
8		<i>Cotoneaster thimphuensis</i>	J. Fryer & B. Hylmo	2009
9		<i>Prunus harae</i>	H. Ohba & S. Akiyama	2010
10		<i>Sorbus karchungii</i>	K. Rushforth	2009
11		<i>Aconitum bhutanobulbilliferum</i>	Y. Kadota	2010
12		<i>Astragalus paroensis</i>	D. Podlech	2010
13		<i>Dysphania bhutanica</i>	A. Sukhorukov	2012
14		<i>Cotoneaster hicksii</i>	J. Fryer & B. Hylmö	2009
15		<i>Dactylicapnos platycarpa</i>	Liden	2010
16		<i>Prunus gongshanensis</i>	J. Wen	2012
17	Snails	<i>Rahula kleini</i>	E. Gittenberger, P. Leda & S. Sherub	2017
18		<i>Rahula trongsaensis</i>	E. Gittenberger, P. Leda & S. Sherub	2017
19		<i>Erhaia wangchuki</i>	E. Gittenberger, P. Leda & B. Stelbrink	2017
20		<i>Truncatellina bhutanensis</i>	E. Gittenberger, P. Leda & S. Sherub	2013
21	Dragonflies	<i>Megalestes gyalsey</i>	T. Gyeltshen, V. J. Kalkman & A. G. Orr	2017
22	Fishes	<i>Parachiloganis bhutanensis</i>	R. J. Thoni & D. B. Gurung	2014
23		<i>Garra bimaculacauda</i>	Thoni, Gurung & Mayden	2016
24		<i>Garra parastenorhynchus</i>	Thoni, Gurung & Mayden	2016
25	Beetles	<i>Trilophidius gemmatus</i>	M. Balkenohl	2017
26		<i>Thanasimus bhutanensis</i>	Gerstmeier	2009
27	Stoneflies	<i>Claassenia drukpa</i>	B. P. Stark & I. Sivec	2010
28	Moths	<i>Thitarodes namnai</i>	N. Maczey, K. Dhendup, P. Cannon, N. Hywel-Jones & T.B. Rai	2010
29		<i>Thitarodes caligophilus</i>	N. Maczey, K. Dhendup, P. Cannon, N. Hywel-Jones, & T.B. Rai	2010
30		<i>Notodonta dedmazai</i>	A. Schintlmeister	2013
31		<i>Salassa bhutanensis</i>	R. Brechlin	2009
32	Aphids	<i>Cavariella bhutanensis</i>	S. Chakrabarti & D. Das	2009
33		<i>Sinolachnus elaeagnensis</i>	S. Chakrabarti & D. Das	2014

Table 1. List of new species discoveries from 2009 to 2017 in Bhutan.

Number of new records by year



Number of new records by taxonomic classification



Number of new records

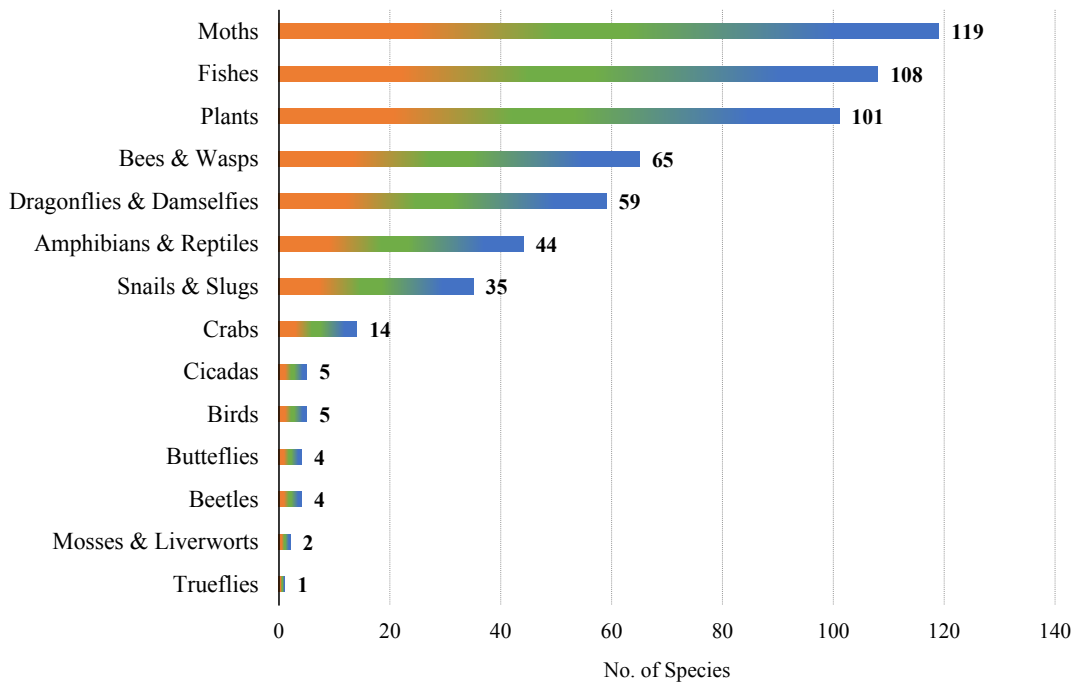


Plate 11. *Parachiloganis bhutanensis*, New endemic fish species (© D.B. Gurung)

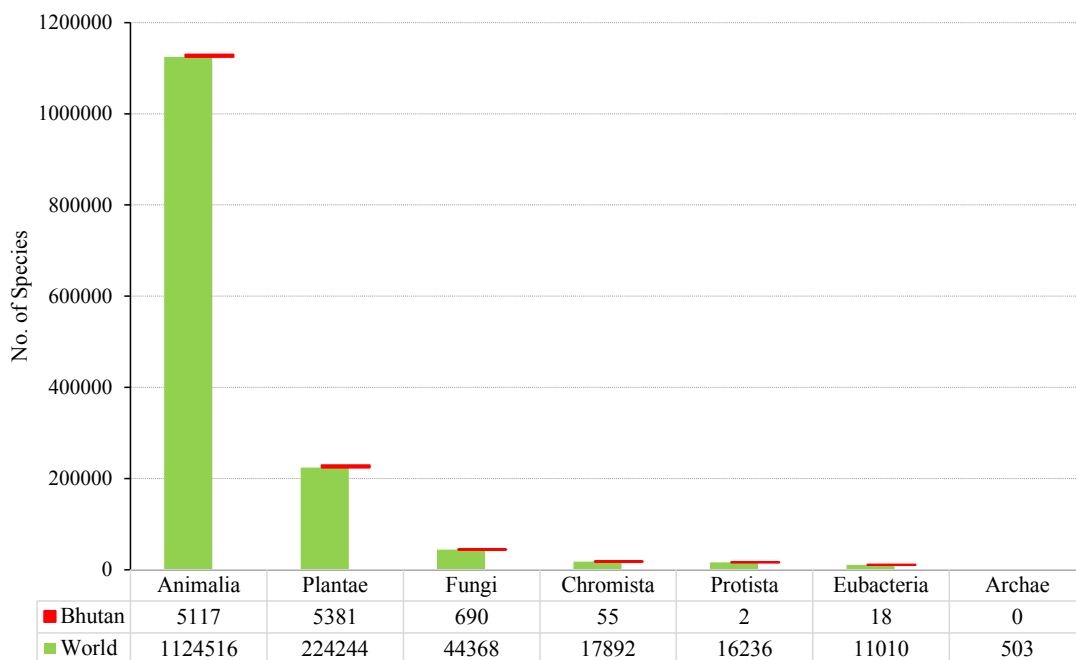
Species Diversity of the World and Bhutan

The number of species recorded in Bhutan is compared with the number of species catalogued in the world, which includes species recorded on earth and in the ocean. This global account of species is based on Mora et al. (2011). Around 8.7 million species are predicted to occur in the world. Bhutan comprises 0.78 % of the total number of catalogued species in the world: 1,438,769 species.

Kingdom	World	Bhutan	Bhutan %
Animalia	1,124,516	5,114	0.46
Plantae	224,244	5,369	2.40
Chromista	17,892	55	0.31
Eubacteria	11,010	18	0.16
Fungi	44,368	690	1.56
Protista	16,236	2	0.01
Archaeobacteria	503	0	0
Total	1,438,769	11248	0.78 %

(Unit: Species, %)

Number of species by kingdom



Percentage of species in Bhutan compared to the world

Classification	%
Animalia	0.46
Plantae	2.40
Chromista	0.31
Eubacteria	0.16
Fungi	1.56
Protista	0.01

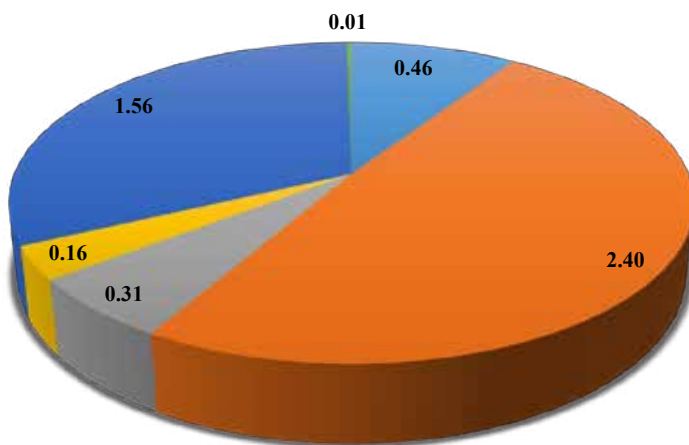


Plate 12. Monal Pheasant (*Lophophorus impejanus*) (© Yeshey Dorji)

Conservation and Protection Status

Data on the conservation status of species is based on the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and the list of protected species found in Bhutan is extracted from the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Forests and Nature Conservation Act of Bhutan (FNCA) 1995, and Forests and Nature Conservation Rules and Regulations (FNCRR) 2017.

1. Protected species of FNCA 1995 and FNCRR 2017

The number of species protected in Bhutan by the Forest and Nature Conservation Act (FNCA) 1995 and Forest and Nature Conservation Rules and Regulations (FNCRR) 2017 are provided according to taxonomic classifications. Some of the protected species are however overlapping in both the legislations. All the protected species in FNCA 1995 fall under Schedule I of the Act. A total of 68 species are protected by both the FNCA 1995 and FNCRR 2017.

Classification	FNCA 1995	FNCRR 2017	Total (without overlapping species)
Mammals	17	22	23
Plants	6	6	6
Fungus	1	1	1
Birds	5	36	36
Fishes	1	1	1
Butterflies	0	1	1
Total	30	67	68



Plate 13. *Cyripedium himalaicum* (© Choki Gyeltshen)

Number of species protected by FNCA 1995

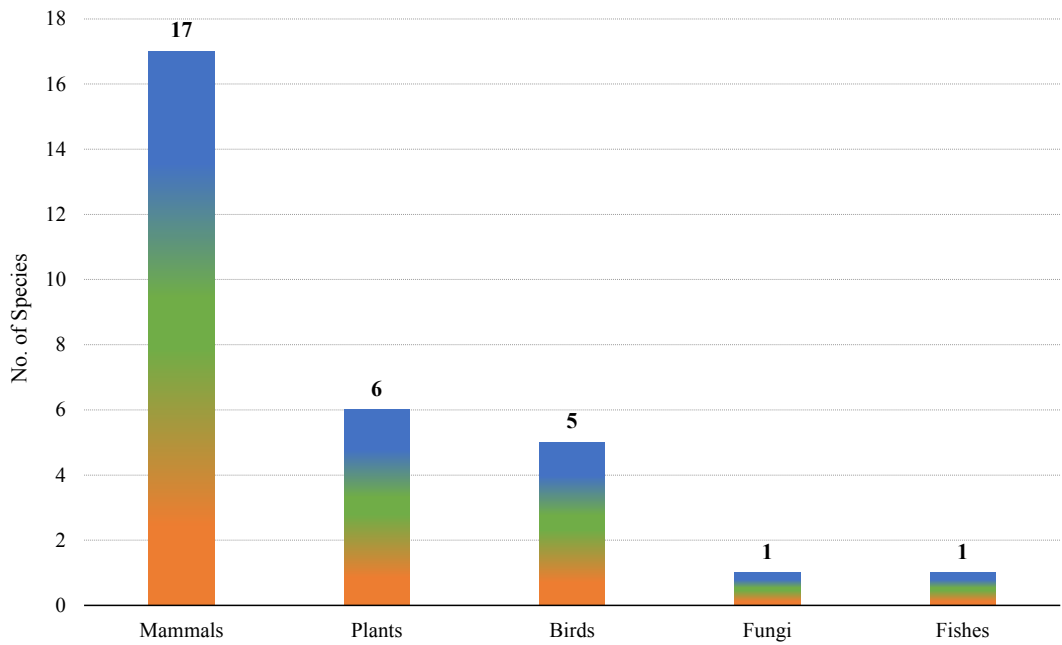
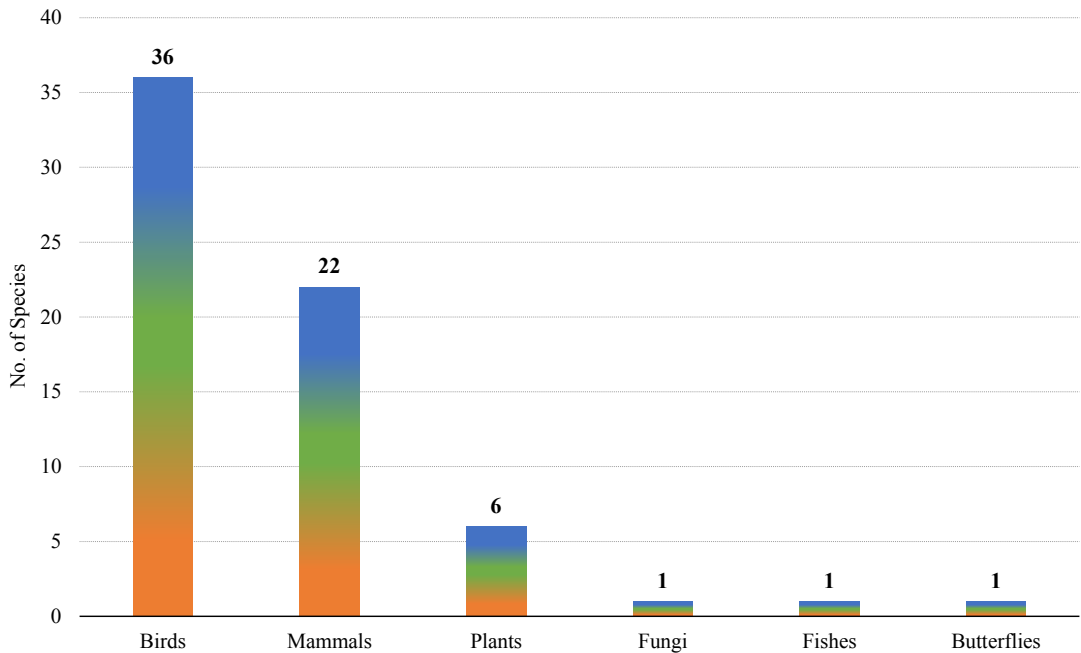


Plate 14. Blue Sheep (*Pseudois nayaur*) is protected by FNCRR 2017 (© Sonam Wangchen)

Number of species protected by FNCRR 2017



IUCN Red List & CITES species

This publication primarily provides data on species having IUCN Red List categories of Vulnerable (VU), Endangered (EN), or Critically Endangered (CR) and/or a listing within Appendix I or II of CITES. In terms of known conservation status, either limited data is available for all the taxonomic groups or the data is deficient. Therefore, currently, conservation status data for only 134 species from the kingdom Animalia and Plantae are published in this publication. Of these, 21 species are Critically Endangered (CR), 43 species Endangered (EN), 70 species Vulnerable (VU), *Brugmansia suaveolens* is Extinct in the Wild (EW) and another plant species, *Eulophia stenopetala* is Extinct (EX).

A total of 513 species are protected by CITES against over-exploitation through international trade. It includes 40 species of fauna and three species of flora in Appendix I, plus 56 species of fauna and 414 species of flora in Appendix II. Globally, around 8,500 species of fauna and 30,000 species of flora are protected by CITES.

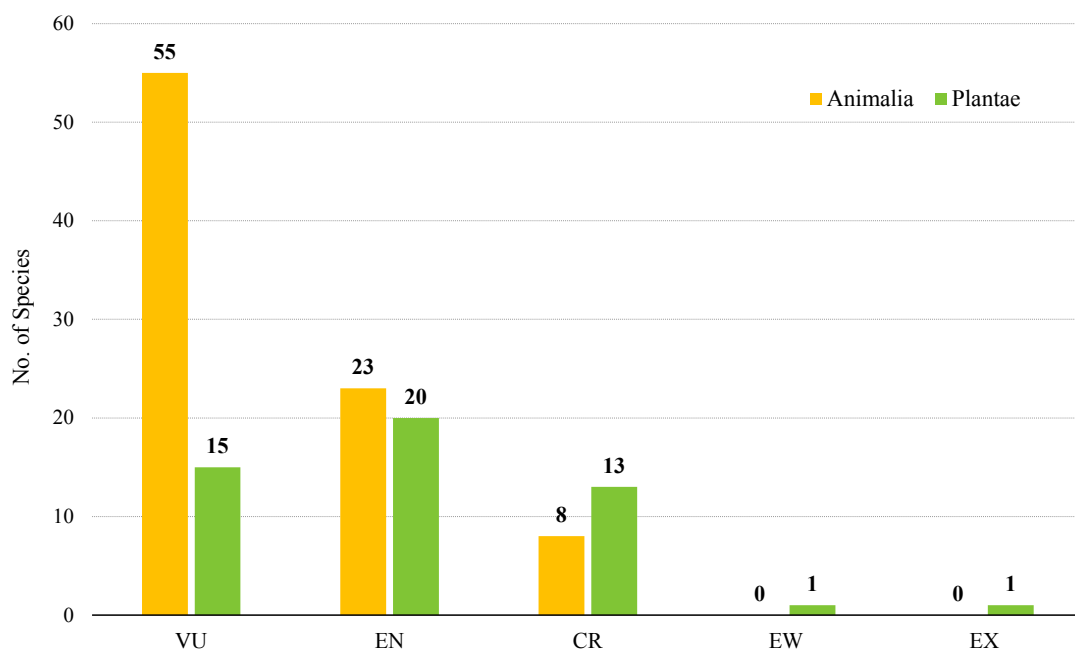
2. IUCN Red List of Threatened Species

Kingdom	Vulnerable (VU)	Endangered (EN)	Critically Endangered (CR)	Extinct in the Wild (EW)	Extinct (EX)
Animalia	55	23	8	0	0
Plantae	15	20	13	1	1
Total	70	43	21	1	1

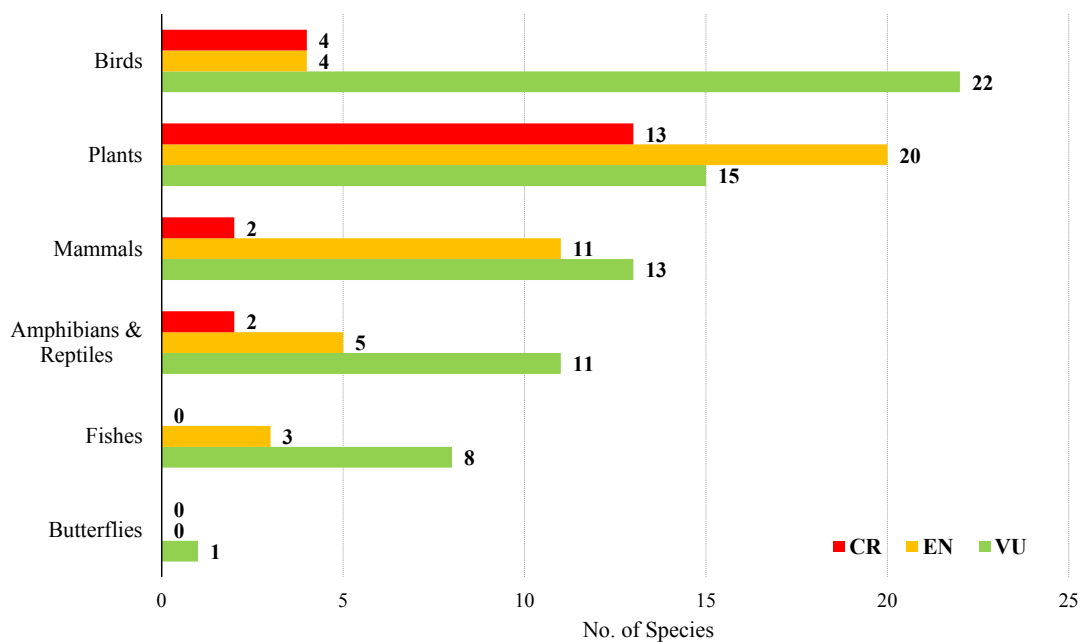
Number of Red List species by taxonomic classification

Classification	Vulnerable (VU)	Endangered (EN)	Critically Endangered (CR)
Fishes	8	3	0
Birds	22	4	4
Mammals	13	11	2
Seed Plants	15	20	13
Amphibians & Reptiles	11	5	2
Butterflies	1	0	0
Total	70	43	21

Number of Red List species by kingdom



Number of Red List species

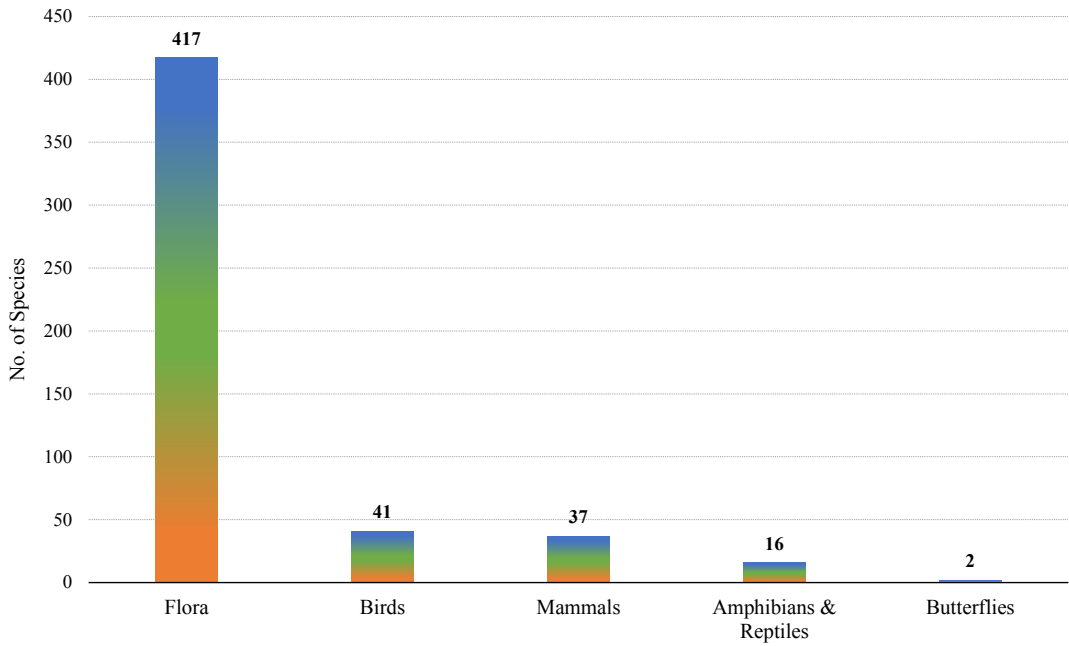


3. Species listed in the CITES Appendices

Number of CITES species by taxonomic classification

Classification		Appendix I	Appendix II
Fauna	Mammals	25	12
	Birds	10	31
	Amphibians & Reptiles	5	11
	Butterflies	0	2
Flora		3	414
Total		43	470

Number of CITES species



Number of species by CITES Appendix

Appendix I

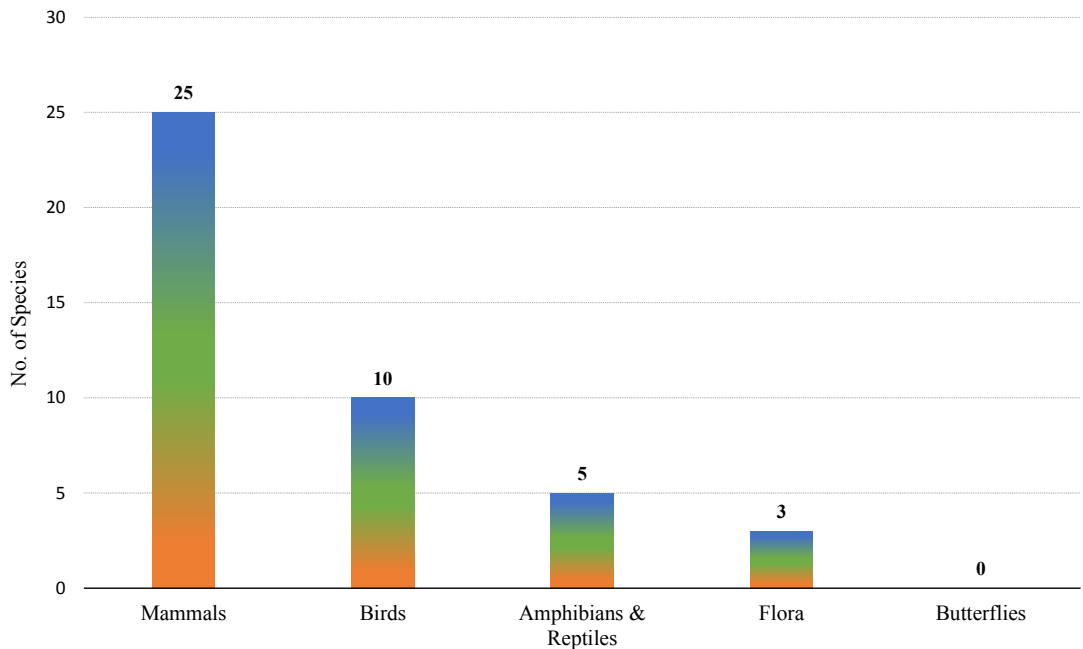


Plate 15. Black-necked Crane (*Grus nigricollis*) (© TCB)



Appendix II

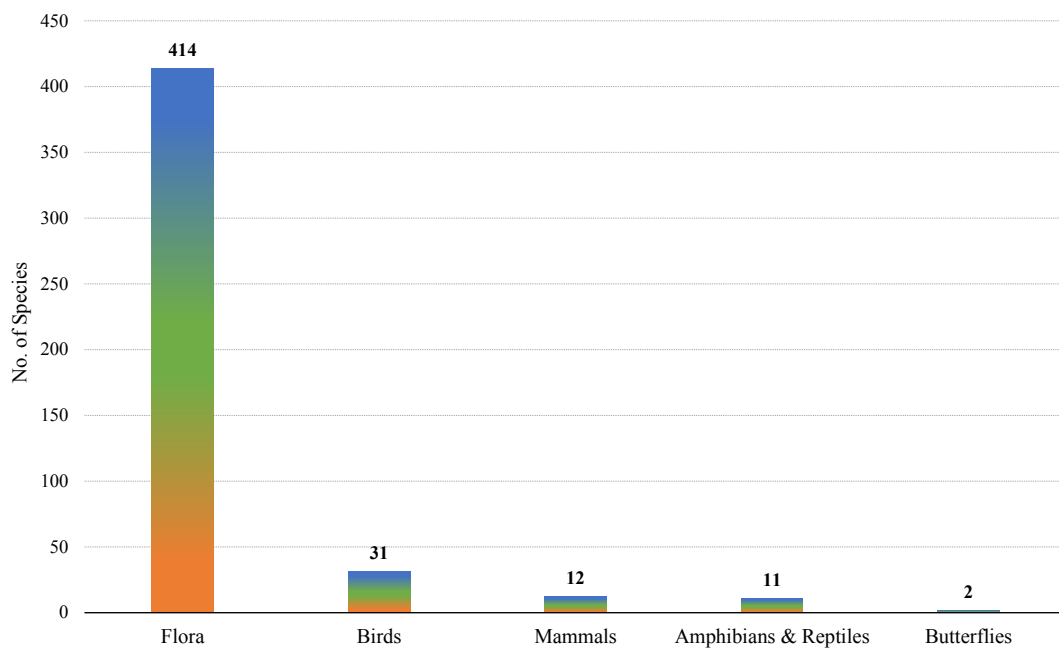


Plate 16. Great Hornbill (*Buceros bicornis*) is listed in CITES Appendix I (© Sonam Wangchen)

List of policies and acts related to biodiversity

Policy & Legal Framework	Description
Constitution of Bhutan 2008	Decreases that the country maintain a minimum of 60 per cent of the total land under forest cover for all time. Article 5.1 of the Constitution states that: “Every Bhutanese is a trustee of the Kingdom’s natural resources and environment”. The government is tasked to conserve and improve the environment and safeguard the country’s biodiversity. It is further directed to secure sustainable development while promoting economic and social development.
Food and Nutrition Security Policy of Bhutan, 2014	Promulgated to create an enabling environment for a healthy population through physical, economic, and social access to safe and adequate nutritious food by the population at all times thereby contributing to Gross National Happiness. Amongst others, it promotes biodiversity conservation for food security and resilience.
National Forest Policy, 2011	Ensures that Bhutan’s forest resources and biodiversity are managed sustainably to provide a wide range of social, economic and environmental benefits while still maintaining the constitutional requirement of a minimum of 60 per cent of the country’s total land area under forest cover. Some of the main features of the policy include a science-based participatory approach to forest governance and sustainable forest management with emphasis on efficient and environment-friendly technologies for value-addition and waste minimization.
Biosecurity Policy of the Kingdom of Bhutan 2010	Ensures the protection of the Bhutanese people and Bhutan’s biodiversity from the harmful effects of pests and diseases, invasive alien species, genetically modified organisms, toxic chemicals and food additives.
Economic Development Policy (EDP) 2010	Identifies a broad range of economic growth opportunities based on “Brand Bhutan” as a Unique Selling Point and recognizes the success of the country’s environmental conservation as one of the main drivers for developing the “Brand Bhutan” theme for which it calls for protection of biodiversity, genetic resources and promotion of indigenous knowledge. The vision of the EDP is “to promote a green and self-reliant economy sustained by an IT-enabled knowledge society guided by the philosophy of GNH”.
Bhutan Water Policy 2003	Focuses on conservation of all forms of water resources and calls for integrated water resource management through extensive soil conservation, watershed area treatment, conservation of forests and increasing the forest area.
Water Act of Bhutan 2011	Establishes water resources as a state property and ensures that it is protected, conserved and/or managed in an economically efficient, socially equitable and environmentally sustainable manner.
Waste Prevention and Management Act of Bhutan 2009	Requires all development activities that generate waste to be planned and executed in harmony and within the carrying capacity of the country’s fragile ecological settings. The Act states that a person polluting the environment or causing ecological harm shall be responsible for the costs of avoidance, containment, abatement, medical compensation, mitigation, remediation and restoration.

Local Government Act 2009	Formulated to support decentralized governance after the introduction of parliamentary democracy in 2008. In terms of environmental conservation, the Act empowers the local government with authority to regulate air, water and noise pollution; approve clearance for mining activities as per law, monitor the establishment of mines and quarries; regulate the harvesting of edible forest products in accordance with forest legislation; prevent encroachment into forests, community and government lands; hold in custody community forests and land as well as medicinal herbs; and to protect and conserve water sources and bodies.
National Environment Protection Act (NEPA) 2007	Provides for the establishment of an effective system to conserve and protect the environment through the National Environment Commission or its successors, designation of competent authorities and constitution of other advisory committees, so as to independently regulate and promote sustainable development in an equitable manner. The Act calls for the conservation of natural resources to be based on a participatory approach aimed at achieving an equitable sharing of the costs and benefits of conservation among resources users.
Land Act of Bhutan 2007	Provides for the leasing of State land for economic and various other activities. All Tsamdros (grazing land) and Sokshings (forest land for collection of leaf litter) rights revert to the State and convert to leasehold uses with management plans giving preference to previous rights holders.
Biodiversity Act of Bhutan 2003	Provides for the conservation and sustainable utilization of biological resources and associated traditional knowledge and ensures protection of new plant varieties through a Sui Generis system. It also authorizes the implementation of the Access and Benefit-sharing regime to derive additional benefits in a fair and equitable manner.
Environmental Assessment Act 2000	Directs the government to ensure that environmental concerns are taken into account when formulating, renewing, modifying and implementing any policy, plan or program. It requires the issuance of environmental clearance as a pre-requisite to the approval of any development activity.
Seeds Act of Bhutan 2000	Regulates the import and export of agriculture seeds and prevents introduction of unwanted plants and diseases. It also promotes the seed industry with the aim to enhance rural income and livelihood.
Pesticide Act of Bhutan, 2000	Encourages the practice of organic agriculture and integrated pest management with a centralized system that controls and limits the import, sale and use of pesticides.
Forest and Nature Conservation Act of Bhutan 1995	Covers forest management, prohibitions and concessions in State Forests, forestry leases, social and community forestry, transport and trade of forestry produce, protected areas, wildlife conservation, soil and water conservation, and forest fire prevention.
Plant Quarantine Act 1993	Enacted to prevent the introduction of pests not already present or widespread in the country; control those pests already present by restricting their spread and by endeavoring to eradicate them; provide facilities for services for import of plants and plant products; and extend cooperation in the prevention or movement of pests in international trade and traffic.

List of Government, Academic and Civil Societies Related to Biodiversity

Institution	Description
National Biodiversity Centre, Thimphu	Mandated to coordinate the implementation of biodiversity conservation and sustainable utilization programs in the country, and specifically the objectives of the CBD. Currently it also implements the programs of work for thematic areas and cross-cutting issues namely Agricultural Biodiversity, Biodiversity Information Management, Access to Genetic Resources and Benefit-sharing, Global Strategy for Plant Conservation, Global Taxonomy Initiative (flora), Invasive Alien Species and Traditional Knowledge, Innovations and Practices.
Department of Forests and Park Services, Thimphu	Overall authority for the management of forest resources and wild biodiversity. It is responsible for <i>in-situ</i> conservation of wild biodiversity through the creation and management of a protected area system; protection and management of forest and wildlife resources; and education and public awareness.
Department of Agriculture, Thimphu	Mandated to enhance food security and income through improved management of field crops, horticulture crops and medicinal plants. Access to markets, farm inputs, construction of farm roads, selection of improved technologies and sustainable land management; and integrated pest management are some of the means identified to achieve its national goals.
Department of Livestock, Thimphu	Responsible for coordination, administration and management of services related to livestock production, livestock input supply and livestock health. It works towards attaining food-security and self-sufficiency in livestock products by ensuring prompt delivery of appropriate technologies and services.
Bhutan Agriculture and Food Regulatory Authority, Thimphu	Regulates the trade of restricted biological resources and its parts and prevents the introduction of pests, diseases and Invasive Alien Species, including Genetically Modified Organisms. It also ensures safety of food and food products in the country for public health.
National Environment Commission, Thimphu	Chaired by the Prime Minister and composed of high-level multi-sectorial representatives is an independent authority and the highest decision-making body on all matters related to the environment and its management in the country. The National Environment Commission Secretariat (NECS) is responsible for implementing the policies, regulations and directives issued by the National Environment Commission.
Department of Local Government	Responsible for overseeing development and governance affairs in the Local Governments for effective management and delivery of public services through provision of overall coordination and guidance in social, economic and political progress of Local Government affairs within the country's overall development guideline and implementation framework.

Royal Society for Protection of Nature, Thimphu	A registered Public Benefit Organization (PBO) under the Civil Society Organization (CSO) Authority of Bhutan since 2010. RSPN has been engaged in environmental conservation through environmental education and advocacy, conservation of natural resources and sustainable livelihoods since 1987. It also focuses on research and emerging issues such as climate change, solid waste and water management.
Bhutan Trust Fund for Environmental Conservation, Thimphu	An independent grant making Organization. It uses its annual investment income of USD 1.5 – 1.8 million to finance field programs for biodiversity/ environmental conservation and the promotion of social welfare in the country.
Bhutan Ecological Society, Thimphu	A registered Civil Society Organization (CSO) engaged in ecology and environmental understanding and conservation. It also has a journal, Journal of Bhutan Ecological Society.
College of Natural Resources, Lobesa	A college offering courses on agriculture, natural resources management, animal husbandry, sustainable development, forestry, and environment and climate studies. It also has a journal, Bhutan Journal for Natural Resources and Development.
Institute of Traditional Medicine, Thimphu	Uses numerous species of medicinal plants to manufacture Traditional Medicines in the country.
Sherubtse College, Trashigang	A college offering courses related to botany, zoology, environment and life sciences.

Glossary

Vascular plants (Tracheophytes)	Plants possessing well-developed conducting tissue for the transport of water, mineral salts and sugar ¹ (includes both seed plants and ferns).
Ferns	Asexual plants that bear minute spores on the back of the fronds or leaves. They usually grow in humid soil, sometimes epiphytically on trees, and in tropical climates ¹ .
Liverworts & hornworts	Liverworts and hornworts are flowerless plants that produce spores in capsules ² .
Mosses	Mosses are flowerless plants with fruits containing spores. The diverse species of mosses grow in various places including on rocks, tree trunks and in running water ^{1,2} .
Algae	The algae group consists of Rhodophyta (red algae), Chlorophyta (green algae), Phaeophyta (brown algae) and Chrysophyta (diatoms). They propagate spores, are unicellular or not differentiated into root, stem and leaf, and generally contain chlorophyll. This group includes seaweed in addition to numerous freshwater plants ¹ .
Green algae	Green algae is the most diverse group of algae. It contains photosynthetic pigments similar to those found in higher plants ^{1,3} .
Brown algae	The largest of the chromists, with the largest brown algae reaching over 30 meters in length, this algal group includes large seaweed genera such as Laminaria (kelp) and Fucus ^{1,3} .
Eubacteria	Eubacteria is one of two subdivisions of the prokaryotes (the other being Archaeobacteria). The diverse range of organisms in this group live in varying environments and fulfil a multitude of roles: they may be disease-causing, anaerobic, autotrophs, or vital for nutrient cycling in ecosystems ^{1,3} .
Cyanobacteria	Also known as blue-green algae, they are aquatic, photosynthetic bacteria that are usually unicellular and grow in visible colonies ³ .
Chromista	Chromista is a kingdom-level taxon that consists of mostly photosynthetic organisms, some of which (such as kelp) play vital roles in aquatic ecosystems ³ .
Diatoms	Diatoms are unicellular, photosynthetic, aquatic microorganisms found in abundance in both marine and freshwater ecosystems. They are an important food source for marine organisms ³ .
Protista	A kingdom consisting of eukaryotes that do not fall into the other three kingdoms: animals, plants and fungi. This taxon is extremely diverse and includes amoebae, algae and slime molds ³ .
Plasmodium	Plasmodium are slime molds that are extremely large single cells with thousands of nuclei. Slime molds live in moist, terrestrial habitats, such as on decaying wood or fresh cow dung ³ .
Mammals	Representing the highest class of Vertebrata, mammals have hair, are warm-blooded, and mammalian young are initially fed milk (or an analogous fluid) secreted by the mammary glands of the mother ^{1,3} .
Diptera	An order of insects, the “true flies”, have one pair of functional wings and a pair of hind wings that have evolved into balancing organs called halteres. Their mouthparts have been modified for sucking or piercing, and this group includes flies and mosquitoes ⁴ .

Hemiptera	Also known as “true bugs”, they all have piercing mouthparts contained in a beak (or rostrum), which they use to suck fluids (usually) from plants. This order includes aphids, cicadas, scale insects ^{3,4} .
Isoptera	This infraorder under the order Blattodea consists of termites- insects that live in social groups and have strong biting mouthparts to chew through seeds, wood or leaves ⁴ .
Orthoptera	An order of insects including grasshoppers and crickets that often possess large hind legs used for jumping and many species have the ability to “sing” by rubbing their legs together or against the side of their bodies ⁴ .
Plecoptera	This order includes stoneflies, a small group of aquatic insects which as adults resemble lacewings, but are more closely related to mayflies ⁴ .
Hymenoptera	A large order of insects including bees, ants, wasps and sawflies. Some species are very social and this group also includes important pollinators of flowering plants ^{3,4} .
Coleoptera	The largest order of insects globally, comprising beetles and weevils ⁴ .
Lepidoptera	An order of insects that includes butterflies and moths. They undergo complete metamorphosis, from ova (egg), which emerge larvae (caterpillars), to quiescent pupae, from which emerge the winged adults ⁴ .
Arthropoda	A phylum of invertebrates with a joined exoskeleton. This group includes arachnids, crustaceans and insects ⁴ .
Euarthropoda	Synonym of Arthropoda.
Odonata	This order comprising some of the most ancient and largest flying invertebrates ever to have inhabited the planet, includes dragonflies and damselflies ^{3,4} .
Nematoda	Nematodes or roundworms can be found almost anywhere on Earth, including soils and sediments, plants, animals, ice, and hot springs ³ .
Mollusca	One of the most diverse divisions of the animal kingdom with soft bodies that are generally covered by a hard exoskeleton. It includes organisms such as snails, octopuses, squid, clams and oysters ³ .
Fungi	Fungi feed by absorbing nutrients from their surrounding environment, reproduce through spores, and play a vital role in their symbiotic relationship with plants, assisting plants to acquire water and nutrients from the soil ³ .
Herpetofauna	A term used to classify amphibians and reptiles together. Herpetofauna are ectotherms and most lay eggs, although some give birth to live young ³ .

The definitions provided in the glossary have been obtained from the following sources:

1. Mondofacto (2019), Biology dictionary, <http://www.mondofacto.com/dictionary/contents/biology.html>, (Accessed April 2019).
2. Australian National Botanic Gardens (2019), Centre for Australian National Biodiversity Research, Plant Information, Bryophytes, <https://www.anbg.gov.au/bryophyte/>, (Accessed April 2019).
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4. Amateur Entomologists’ Society (2019), <https://www.amentsoc.org/>, (Accessed April 2019).

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Annexure 1: List of New Records (2009 - 2017)

Birds		
S.N.	Species	Year
1	<i>Athene noctua</i>	2017
2	<i>Calcarius lapponicus</i>	2016
3	<i>Callacanthus burtoni</i>	2009
4	<i>Pluvialis fulva</i>	2009
5	<i>Schoeniclus rusticus</i>	2017
Snails and Slugs		
1	<i>Allopeas clavulinum</i>	2017
2	<i>Ariophanta interrupta</i>	2017
3	<i>Bellamyia (Filopaludina) bengalensis</i>	2017
4	<i>Bensonella plicidens</i>	2017
5	<i>Bradybaena radicolica</i>	2017
6	<i>Brotia costula</i>	2017
7	<i>Carychium indicum</i>	2017
8	<i>Curvella khasiana</i>	2017
9	<i>Cyclophorus aurora</i>	2017
10	<i>Cyclophorus pearsoni</i>	2017
11	<i>Galba truncatula</i>	2017
12	<i>Gastrocopta huttoniana</i>	2017
13	<i>Gulella bicolor</i>	2017
14	<i>Gyraulus rotula</i>	2017
15	<i>Gyraulus sivalensis</i>	2017
16	<i>Kaliella barrakporensis</i>	2017
17	<i>Lamellidens jenkinsianus</i>	2017
18	<i>Landouria huttoni</i>	2017
19	<i>Lissachatina fulica</i>	2017
20	<i>Macrochlamys indica</i>	2017
21	<i>Melanoides tuberculata</i>	2017
22	<i>Mirus nilagiricus</i>	2017
23	<i>Paludomus conica</i>	2017
24	<i>Pearsonia nagaensis</i>	2017
25	<i>Pupilla turcmenica</i>	2017
26	<i>Radix acuminata</i>	2017
27	<i>Radix andersoniana</i>	2017
28	<i>Rahula bascauda</i>	2017
29	<i>Schistoloma funicularum</i>	2017
30	<i>Streptaulus blanfordi</i>	2017
31	<i>Thiara (Tarebia) granifera</i>	2017
32	<i>Thiara (Tarebia) lineata</i>	2017
33	<i>Thiara (Thiara) scabra</i>	2017

34	<i>Trachia delibrata</i>	2017
35	<i>Vallonia costohimala</i>	2017
Dragonflies & Damselflies		
1	<i>Aciagrion pallidum</i>	2016
2	<i>Aeshna shennong</i>	2017
3	<i>Agriocnemis clauseni</i>	2014
4	<i>Agriocnemis femina</i>	2012
5	<i>Anaciaeschna jaspidea</i>	2012
6	<i>Anax guttatus</i>	2017
7	<i>Anax indicus</i>	2014
8	<i>Anisogomphus bivittatus</i>	2013
9	<i>Anisogomphus occipitalis</i>	2017
10	<i>Anisopleura lestoides</i>	2016
11	<i>Argiocnemis rubescens rubeola</i>	2012
12	<i>Aristocypha (Rhinocypha) cuneata</i>	2014
13	<i>Asiagomphus odoneli</i>	2017
14	<i>Brachydiplax sobrina</i>	2014
15	<i>Calicnemia miniata</i>	2012
16	<i>Camacinia gigantea</i>	2017
17	<i>Ceriagrion coromandelianum</i>	2012
18	<i>Ceriagrion rubiae</i>	2012
19	<i>Chlorogomphus mortoni</i>	2012
20	<i>Chlorogomphus preciosus</i>	2017
21	<i>Coeliccia svihleri</i>	2012
22	<i>Copera vittata assamensis</i>	2012
23	<i>Cratilla lineata</i>	2012
24	<i>Crocothemis erythraea</i>	2016
25	<i>Davidius zallorensis</i>	2017
26	<i>Dysphaea gloriosa</i>	2012
27	<i>Enallagma parvum</i>	2012
28	<i>Epiophlebia laidlawi</i>	2009
29	<i>Euphaea ochracea brunnea</i>	2012
30	<i>Gynacantha incisura</i>	2016
31	<i>Gynacantha khasiaca</i>	2016
32	<i>Gynacantha subinterrupta</i>	2017
33	<i>Gynacanthaeschna sikkima</i>	2016
34	<i>Himalagrion exclamazione</i>	2014
35	<i>Huosoma tinctipenne</i>	2013
36	<i>Lamelligomphus risi</i>	2016
37	<i>Lestes praemorsus</i>	2014
38	<i>Lestes thoracicus</i>	2012

39	<i>Libellago lineata</i>	2017
40	<i>Lyriothemis bivittata</i>	2017
41	<i>Megalestes irma</i>	2016
42	<i>Neallogaster hermionae</i>	2017
43	<i>Neurothemis intermedia atalanta</i>	2014
44	<i>Paragomphus lineatus</i>	2012
45	<i>Periaeschna magdalena</i>	2013
46	<i>Perissogomphus stevensi</i>	2014
47	<i>Philoganga montana</i>	2017
48	<i>Polycanthagyna erythromelas</i>	2013
49	<i>Potamarcha congener</i>	2017
50	<i>Protosticta himalaica</i>	2012
51	<i>Rhinocypha quadrimaculata</i>	2012
52	<i>Rhyothemis phyllis</i>	2017
53	<i>Somatochlora daviesi</i>	2016
54	<i>Stylogomphus inglisi</i>	2017
55	<i>Sympetrum fonscolombii</i>	2016
56	<i>Tholymis tillarga</i>	2016
57	<i>Tramea basilaris</i>	2014
58	<i>Vestalis g. gracilis</i>	2012
59	<i>Zygonyx iris</i>	2017

Bees and Wasps

1	<i>Campsomeriella (Annulimeris) annulata annulata</i>	2017
2	<i>Campsomeriella (Campsomeriella) collaris collaris</i>	2017
3	<i>Delta conoideum</i>	2016
4	<i>Delta esuriens</i>	2016
5	<i>Delta pyriforme pyriforme</i>	2016
6	<i>Dolichovespula lama</i>	2017
7	<i>Eumenes gibbosus</i>	2016
8	<i>Eustenogaster scitula</i>	2017
9	<i>Labus pusillus</i>	2016
10	<i>Liacos erythrosoma erythrosoma</i>	2017
11	<i>Megacampsomeris cochinesis</i>	2017
12	<i>Megacampsomeris shillongensis</i>	2017
13	<i>Megascolia (Regiscolia) azurea christiana</i>	2017
14	<i>Megascolia (Regiscolia) azurea hindostana</i>	2017
15	<i>Parapolybia nodosa</i>	2017
16	<i>Parapolybia varia</i>	2017
17	<i>Pareumenes quadrispinosus acutus</i>	2016

18	<i>Parischnogaster mellyi</i>	2017
19	<i>Phalerimeris phalerata phalerata</i>	2017
20	<i>Polistes (Gyrostoma) olivaceus</i>	2016
21	<i>Polistes (Gyrostoma) rothneyi sikkimensis</i>	2016
22	<i>Polistes (Gyrostoma) tenebricosus sulcatus</i>	2016
23	<i>Polistes (Polistella) nigratarsus</i>	2017
24	<i>Polistes (Polistella) santoshae</i>	2016
25	<i>Provespa barthelemyi</i>	2017
26	<i>Ropalidia artifex</i>	2017
27	<i>Ropalidia fasciata</i>	2016
28	<i>Ropalidia jacobsoni</i>	2016
29	<i>Ropalidia ornaticeps</i>	2017
30	<i>Ropalidia rufocollaris</i>	2016
31	<i>Ropalidia rufoplagiata gravelyi</i>	2017
32	<i>Ropalidia santoshae</i>	2016
33	<i>Ropalidia stigma</i>	2017
34	<i>Scolia (Discolia) bimotata binotata</i>	2017
35	<i>Scolia (Discolia) clypeata rufuhirta</i>	2017
36	<i>Scolia (Discolia) dehraensis</i>	2017
37	<i>Scolia (Discolia) desidiosa</i>	2017
38	<i>Scolia (Discolia) elizabethae</i>	2017
39	<i>Scolia (Discolia) fasciatopunctata dunensis</i>	2017
40	<i>Scolia (Discolia) kamengensis</i>	2017
41	<i>Scolia (Discolia) rugifrons</i>	2017
42	<i>Scolia (Discolia) venusta</i>	2017
43	<i>Vespa affinis affinis</i>	2017
44	<i>Vespa affinis indosinensis</i>	2017
45	<i>Vespa analis nigrans</i>	2017
46	<i>Vespa basalis</i>	2017
47	<i>Vespa bicolor</i>	2017
48	<i>Vespa fumida</i>	2017
49	<i>Vespa mandarinia magnifica</i>	2017
50	<i>Vespa tropica leefmansi</i>	2017
51	<i>Vespa velutina nigrithorax</i>	2017
52	<i>Vespa velutina variana</i>	2017
53	<i>Vespa vivax</i>	2017
54	<i>Vespula flaviceps flaviceps</i>	2017
55	<i>Vespula nursei</i>	2017
56	<i>Vespula structor</i>	2017
57	<i>Vespula vulgaris</i>	2017

58	<i>Xylocopa (Ctenopoda) fenestrata</i>	2016
59	<i>Xylocopa (Cyaneoderes) acutipennis</i>	2016
60	<i>Xylocopa (Nyctomelitta) tranquebarica</i>	2016
61	<i>Xylocopa (Orbitella) aestauns</i>	2016
62	<i>Xylocopa (Platynopoda) latipes</i>	2016
63	<i>Xylocopa (Platynopoda) magnifica</i>	2016
64	<i>Xylocopa (Zonohirsuta) collaris binghami</i>	2016
65	<i>Zethus dolosus</i>	2016
True Flies (Diptera)		
1	<i>Culex (Culiciomyia) sasai</i>	2017
Ampibians & Reptiles		
1	<i>Amolops himalayanus</i>	2016
2	<i>Amolops mantzorum</i>	2013
3	<i>Amphiesma platyceps</i>	2013
4	<i>Calotes maria</i>	2016
5	<i>Chiromantis vittatus</i>	2014
6	<i>Chrysopelea ornata</i>	2012
7	<i>Cnemaspis assamensis</i>	2016
8	<i>Cuora amboinensis</i>	2012
9	<i>Cuora mouhotii</i>	2012
10	<i>Cyclemys gemeli</i>	2012
11	<i>Dendrelaphis tristis</i>	2012
12	<i>Dinodon gammiei</i>	2013
13	<i>Euphlyctis cyanophlyctis</i>	2013
14	<i>Fejervarya nepalensis</i>	2013
15	<i>Fejervarya pierrei</i>	2013
16	<i>Fejervarya teraiensis</i>	2013
17	<i>Gekko gekko</i>	2012
18	<i>Hylarana taipehensis</i>	2013
19	<i>Indotestudo elongata</i>	2012
20	<i>Ingerana borealis</i>	2016
21	<i>Lycodon aulicus</i>	2012
22	<i>Lycodon fasciatus</i>	2012
23	<i>Lycodon jara</i>	2012
24	<i>Melanochelys tricarinata</i>	2012
25	<i>Melanochelys trijuga</i>	2013
26	<i>Naja naja</i>	2012
27	<i>Nanorana annandalii</i>	2014
28	<i>Nanorana conaensis</i>	2013
29	<i>Nanorana pleskei</i>	2013
30	<i>Oligodon taeniolatus</i>	2014
31	<i>Ophisaurus gracilis</i>	2013

32	<i>Ptyctolaemus gularis</i>	2014
33	<i>Python bivittatus</i>	2012
34	<i>Ramphotyphlops braminus</i>	2012
35	<i>Rhabdophis subminiatus</i>	2012
36	<i>Sphenomorphus maculatus</i>	2012
37	<i>Sylvirana cf. guentheri</i>	2013
38	<i>Sylvirana leptoglossa</i>	2013
39	<i>Trimeresurus albolabris</i>	2012
40	<i>Trimeresurus properirum</i>	2016
41	<i>Uperodon globulosus</i>	2016
42	<i>Xenophrys glandulosa</i>	2013
43	<i>Xenophrys major</i>	2013
44	<i>Xenophrys minor</i>	2013
Plants		
1	<i>Acanthophippium striatum</i>	2017
2	<i>Agrostophyllum planicaule</i>	2017
3	<i>Anoectochilus brevilabris</i>	2017
4	<i>Aphyllorchis alpina</i>	2017
5	<i>Bulbophyllum (c.f.) striatum</i>	2017
6	<i>Bulbophyllum bifurcatoflorens</i>	2017
7	<i>Bulbophyllum bisetum</i>	2017
8	<i>Bulbophyllum cornu-cervi</i>	2017
9	<i>Bulbophyllum cylindraceum</i>	2017
10	<i>Bulbophyllum depressum</i>	2017
11	<i>Bulbophyllum hirtum</i>	2017
12	<i>Bulbophyllum interpositum</i>	2017
13	<i>Bulbophyllum leptanthum</i>	2017
14	<i>Bulbophyllum longiflorum</i>	2017
15	<i>Bulbophyllum mucronatum</i>	2017
16	<i>Bulbophyllum nipondhii</i>	2017
17	<i>Bulbophyllum obrienianum</i>	2017
18	<i>Bulbophyllum raskotii</i>	2017
19	<i>Bulbophyllum rigidum</i>	2017
20	<i>Bulbophyllum sarcophylloides</i>	2017
21	<i>Bulbophyllum sarcophyllum</i>	2017
22	<i>Bulbophyllum sterile</i>	2017
23	<i>Bulbophyllum sunipia</i>	2017
24	<i>Bulbophyllum viridiflorum</i>	2017
25	<i>Calanthe davidii</i>	2017
26	<i>Calanthe densiflora</i>	2017
27	<i>Calanthe yuksommensis</i>	2017
28	<i>Callostylis bambusifolia</i>	2017
29	<i>Callostylis rigida Blume</i>	2017

30	<i>Chamaegastrodia shikokiana</i>	2017
31	<i>Cheirostylis griffithii</i>	2017
32	<i>Cheirostylis yunnanensis</i>	2017
33	<i>Chrysoglossum ornatum</i>	2017
34	<i>Cleisostoma discolor</i>	2017
35	<i>Cleisostoma filiforme</i>	2017
36	<i>Cleisostoma simondii</i>	2017
37	<i>Conchidium pusillum</i>	2017
38	<i>Crepidium josephianum</i>	2017
39	<i>Crepidium khasianum</i>	2017
40	<i>Crepidium purpureum</i>	2017
41	<i>Cymbidium aloifolium</i>	2017
42	<i>Cymbidium cochleare</i>	2017
43	<i>Cymbidium eburneum</i>	2017
44	<i>Cymbidium macrorhizon</i>	2017
45	<i>Dendrobium jenkinsii</i>	2017
46	<i>Dendrobium monticola</i>	2017
47	<i>Dendrobium porphyrochilum</i>	2017
48	<i>Dendrobium rabanii</i>	2017
49	<i>Dendrobium ruckeri</i>	2017
50	<i>Didymoplexis pallens</i>	2017
51	<i>Epipogium japonicum</i>	2017
52	<i>Epipogium roseum</i>	2017
53	<i>Eria (cf.) clavicaulis</i>	2017
54	<i>Eria bhutanica</i>	2017
55	<i>Eria biflora</i>	2017
56	<i>Eria vittata</i>	2017
57	<i>Eulophia zollingeri</i>	2017
58	<i>Gastrochilus (cf.) linearifolius</i>	2017
59	<i>Geodorum densiflorum</i>	2017
60	<i>Goodyera biflora</i>	2017
61	<i>Habenaria furcifera</i>	2017
62	<i>Habenaria pectinata</i>	2017
63	<i>Herminium monorchis</i>	2017
64	<i>Liparis bistrata</i>	2017
65	<i>Liparis deflexa</i>	2017
66	<i>Liparis elliptica</i>	2017
67	<i>Liparis fissipetala</i>	2017
68	<i>Liparis pygmaea</i>	2017
69	<i>Liparis rostrata</i>	2017
70	<i>Neottia alternifolia</i>	2017
71	<i>Neottia microglottis</i>	2017
72	<i>Nephelaphyllum pulchrum</i>	2017

73	<i>Oberonia maxima</i>	2017
74	<i>Odontochilus grandiflorus</i>	2017
75	<i>Odontochilus poilanei</i>	2017
76	<i>Otochilus albus</i>	2017
77	<i>Panisea yunnanensis</i>	2017
78	<i>Paphiopedilum venustum</i>	2017
79	<i>Peristylus biermannianus</i>	2017
80	<i>Phaius wallichii</i>	2017
81	<i>Phalaenopsis lobbii</i>	2017
82	<i>Phreatia elegans</i>	2017
83	<i>Platanthera albomarginata</i>	2017
84	<i>Platanthera dyeriana</i>	2017
85	<i>Platanthera sikkimensis</i>	2017
86	<i>Pteroceras teres</i>	2017
87	<i>Rhomboda arunachalensis</i>	2017
88	<i>Rhomboda lanceolata</i>	2017
89	<i>Sorbus hedlundii</i>	2009
90	<i>Spiranthes (cf.) hongkongensis</i>	2017
91	<i>Stereochilus hirtus</i>	2017
92	<i>Tainia minor</i>	2017
93	<i>Tainia penangiana</i>	2017
94	<i>Thelasis pygmaea</i>	2017
95	<i>Thrixspermum japonicum</i>	2017
96	<i>Thrixspermum musciflorum</i>	2017
97	<i>Trichotosia dasyphylla</i>	2017
98	<i>Trichotosia pulvinata</i>	2017
99	<i>Tropidia namasiae</i>	2017
100	<i>Uncifera acuminata</i>	2017
101	<i>Zeuxine affinis</i>	2017
Fishes		
1	<i>Aborichthys garoensis</i>	2013
2	<i>Acanthocobitis botia</i>	2013
3	<i>Ailia coila</i>	2013
4	<i>Amblyceps apangi</i>	2013
5	<i>Amblyceps cerinum</i>	2017
6	<i>Amblyceps cf. arunachalensis</i>	2017
7	<i>Amblyceps mangois</i>	2013
8	<i>Anguilla bengalensis</i>	2013
9	<i>Aspidoparia jaya</i>	2017
10	<i>Aspidoparia morar</i>	2013
11	<i>Badis badis</i>	2013
12	<i>Badis dibruensis</i>	2017
13	<i>Bagarius bagarius</i>	2013

14	<i>Bangana dero</i>	2013
15	<i>Barilius barna</i>	2013
16	<i>Barilius bendelisis</i>	2013
17	<i>Barilius shacra</i>	2017
18	<i>Barilius vagra</i>	2013
19	<i>Batasio batasio</i>	2013
20	<i>Batasio fasciolatus</i>	2013
21	<i>Batasio merianiensis</i>	2013
22	<i>Botia almorhae</i>	2013
23	<i>Botia dario</i>	2013
24	<i>Catla catla</i>	2013
25	<i>Chagunius chagunio</i>	2013
26	<i>Channa amphibeus</i>	2013
27	<i>Channa gachua</i>	2013
28	<i>Channa melanostigma</i>	2017
29	<i>Channa punctata</i>	2013
30	<i>Channa stewartii</i>	2013
31	<i>Channa striata</i>	2013
32	<i>Cirrhinus mrigala</i>	2013
33	<i>Clarias magur</i>	2013
34	<i>Crossocheilus latius</i>	2013
35	<i>Ctenopharyngodon idella</i>	2013
36	<i>Daino dangila</i>	2013
37	<i>Danio cf. assamila</i>	2017
38	<i>Danio rerio</i>	2013
39	<i>Devario aequipinnatus</i>	2013
40	<i>Devario assamensis</i>	2017
41	<i>Exostoma labiatum</i>	2013
42	<i>Gagata cenia</i>	2013
43	<i>Garra annandalei</i>	2013
44	<i>Garra arunachalensis</i>	2017
45	<i>Garra arupi</i>	2016
46	<i>Garra birostris</i>	2016
47	<i>Garra gotyla</i>	2013
48	<i>Garra lamta</i>	2017
49	<i>Garra lissorhynchus</i>	2016
50	<i>Garra quadratirostris</i>	2017
51	<i>Glossogobius giuris</i>	2017
52	<i>Glyptothorax botius</i>	2017
53	<i>Glyptothorax cavia</i>	2013
54	<i>Glyptothorax cf. panda</i>	2017
55	<i>Glyptothorax cf. telchitta</i>	2013
56	<i>Glyptothorax striatus</i>	2013

57	<i>Gogangra viridescens</i>	2013
58	<i>Heteropneustes fossilis</i>	2013
59	<i>Hypophthalmichthys molitrix</i>	2013
60	<i>Hypophthalmichthys nobilis</i>	2013
61	<i>Labeo dyocheilus</i>	2013
62	<i>Labeo pangusia</i>	2013
63	<i>Labeo rohita</i>	2013
64	<i>Lepidocephalichthys guntea</i>	2013
65	<i>Macrornathus morehensis</i>	2013
66	<i>Mastacembelus armatus</i>	2013
67	<i>Mystus bleekeri</i>	2013
68	<i>Mystus cf. dibrugarensis</i>	2013
69	<i>Mystus vittatus</i>	2013
70	<i>Nandus nandus</i>	2013
71	<i>Neoeucirrhichthys maydelli</i>	2017
72	<i>Neolissochilus dukai</i>	2017
73	<i>Neolissochilus hexagonolepis</i>	2013
74	<i>Neolissochilus hexasticus</i>	2017
75	<i>Olyra cf. kempii</i>	2013
76	<i>Olyra praestigiosa</i>	2017
77	<i>Ompok pabda</i>	2013
78	<i>Oncorhynchus mykiss</i>	2013
79	<i>Oreochthys crenuchoides</i>	2017
80	<i>Paracanthobotus abutwebi</i>	2017
81	<i>Pethia conchoniis</i>	2017
82	<i>Pethia ticto</i>	2017
83	<i>Pseudecheneis sirenica</i>	2017
84	<i>Pseudecheneis sulcata</i>	2013
85	<i>Pseudolaguvia ferula</i>	2013
86	<i>Psilorhynchus balitora</i>	2013
87	<i>Psilorhynchus cf. arunachalensis</i>	2017
88	<i>Pterocryptis barakensis</i>	2017
89	<i>Puntius chola</i>	2013
90	<i>Puntius sarana</i>	2013
91	<i>Puntius sophore</i>	2017
92	<i>Puntius ticto</i>	2013
93	<i>Raiamas bola</i>	2013
94	<i>Rasbora daniconius</i>	2013
95	<i>Schistura cf. beavani</i>	2017
96	<i>Schistura cf. kangjupkhulensis</i>	2017
97	<i>Schistura cf. reticulofasciatus</i>	2013
98	<i>Schistura cf. savona</i>	2017
99	<i>Schistura inglisi</i>	2013

100	<i>Schistura multifasciata</i>	2013
101	<i>Schistura scaturigina</i>	2013
102	<i>Schizothorax molesworthi</i>	2013
103	<i>Schizothorax progastus</i>	2013
104	<i>Semiplotus semiplotus</i>	2013
105	<i>Tetraodon cutcutia</i>	2013
106	<i>Tor putitora</i>	2013
107	<i>Tor tor</i>	2013
108	<i>Xenentodon cancila</i>	2013
Beetles		
1	<i>Cybister tripunctatus lateralis</i>	2015
2	<i>Hydaticus (Prodaticus) satoi satoi</i>	2013
3	<i>Hydaticus ricinus</i>	2015
4	<i>Laccophilus inefficiens</i>	2015
Crabs		
1	<i>Acanthopotamon fungosum</i>	2014
2	<i>Acanthopotamon martensi</i>	2014
3	<i>Acanthopotamon panningi</i>	2014
4	<i>Alcomon lophocarpus</i>	2014
5	<i>Alcomon superciliosum</i>	2014
6	<i>Barytelphusa cunicularis</i>	2014
7	<i>Barytelphusa lugubris</i>	2014
8	<i>Himalayapotamon atkinsonianum</i>	2014
9	<i>Himalayapotamon emphysetum</i>	2017
10	<i>Liotelphusa quadrata</i>	2017
11	<i>Liothelphusa laevis</i>	2014
12	<i>Macrobrachium assamense</i>	2014
13	<i>Maydelliathelphusa lugubris</i>	2014
14	<i>Potamiscus sikkimense</i>	2014
Butterflies		
1	<i>Apostictopterus fuliginosus</i>	2012
2	<i>Euthalia amplifascia</i>	2012
3	<i>Neozephyrus suroia</i>	2012
4	<i>Una usta</i>	2016
Moths		
1	<i>Actinotia intermediata</i>	2017
2	<i>Aethaloessa calidalis</i>	2016
3	<i>Agathodes ostentalis</i>	2016
4	<i>Agrioglypta zelimalis</i>	2016
5	<i>Agrotera basinotata</i>	2016
6	<i>Archips limatus</i>	2017
7	<i>Arctiolepis rubida</i>	2016
8	<i>Arthroschista hilaralis</i>	2016

9	<i>Asota caricae</i>	2017
10	<i>Belippa horrida</i>	2017
11	<i>Botyodes asialis</i>	2016
12	<i>Botyodes caldusalis</i>	2016
13	<i>Botyodes crocopteralis</i>	2016
14	<i>Bradina diagonalis</i>	2016
15	<i>Calamotropha latellus</i>	2016
16	<i>Cheromettia ferruginea</i>	2017
17	<i>Chrysoabdia bivitta</i>	2017
18	<i>Chrysoteuchia divisella</i>	2017
19	<i>Cirrhochrista brizoalis</i>	2016
20	<i>Cirrhochrista fumipalpis</i>	2016
21	<i>Cirrhochrista fuscusa</i>	2016
22	<i>Clanis hyperion</i>	2014
23	<i>Cnaphalocrosis medinalis</i>	2016
24	<i>Conogethes punctiferalis</i>	2016
25	<i>Cotachena nepalensis</i>	2016
26	<i>Cotachena pubescens</i>	2016
27	<i>Crocidolomia luteolalis</i>	2016
28	<i>Crocidophora fasciata</i>	2016
29	<i>Cyana signa</i>	2017
30	<i>Cydalima conchylalis</i>	2016
31	<i>Diaphnia indica</i>	2016
32	<i>Diathrausta profundalis</i>	2016
33	<i>Dichocrocis definita</i>	2016
34	<i>Dichocrocis zebralis</i>	2016
35	<i>Dichocrocis rigidalis</i>	2016
36	<i>Drepana grisearipennis</i>	2017
37	<i>Endocrosis flavibasalis</i>	2016
38	<i>Endotricha ruminalis</i>	2016
39	<i>Eoophyla peribocalis</i>	2016
40	<i>Eoophyla sejunctalis</i>	2016
41	<i>Epiparbattia gloriosalis whalleyi</i>	2016
42	<i>Eristena bifurcalis</i>	2016
43	<i>Erpis macularis</i>	2016
44	<i>Eudocima salaminia</i>	2017
45	<i>Filodes fulvidorsalis</i>	2016
46	<i>Glyphodes bivitralis</i>	2016
47	<i>Glyphodes canthusalis</i>	2016
48	<i>Glyphodes crithealis</i>	2016
49	<i>Glyphodes harutai</i>	2016
50	<i>Glyphodes onychinalis</i>	2016
51	<i>Glyphodes stolalis</i>	2016

52	<i>Haritalodes derogata</i>	2016
53	<i>Heortia vitessoides</i>	2016
54	<i>Hyalobathra miniosalis</i>	2016
55	<i>Hyalopлага pulchralis</i>	2016
56	<i>Hypsopygia mauritialis</i>	2016
57	<i>Hypsopygia nitidiciliaris</i>	2016
58	<i>Iotaphora iridicolor</i>	2017
59	<i>Iraga rugosa</i>	2017
60	<i>Ischyja hemiphaea</i>	2017
61	<i>Lamoria virescens</i>	2016
62	<i>Lista ficki</i>	2016
63	<i>Lumaria probolias</i>	2017
64	<i>Maruca vitrata</i>	2016
65	<i>Miresa fulgida</i>	2017
66	<i>Nacoleia chrysorycta</i>	2016
67	<i>Nacoleia commixta</i>	2016
68	<i>Nausinoe geometralis</i>	2016
69	<i>Nausinoe pueritia</i>	2016
70	<i>Nevina aboe</i>	2017
71	<i>Nevrina procopia</i>	2016
72	<i>Nomophila noctuella</i>	2017
73	<i>Nosophora semitritalis</i>	2016
74	<i>Olivenebula pulcherrima</i>	2017
75	<i>Omiodes noctescens</i>	2016
76	<i>Omphisa anastomosalis</i>	2016
77	<i>Orphnophanes eucerusalis</i>	2016
78	<i>Orthospila orissusalis</i>	2016
79	<i>Orybina flaviplaga</i>	2016
80	<i>Orybina plangonalis</i>	2016
81	<i>Pachynoa sabelialis</i>	2016
82	<i>Pachynoa xanthochryta</i>	2016
83	<i>Pagyda salvalis</i>	2016
84	<i>Palpita annulifer</i>	2016
85	<i>Palpita asiaticalis</i>	2016
86	<i>Palpita warrenalis</i>	2016
87	<i>Paraponyx fluctuosalis</i>	2016
88	<i>Paraponyx stagnalis</i>	2016
89	<i>Parotis marginata</i>	2016
90	<i>Patania caletoralis</i>	2016
91	<i>Polythlipta cerealis</i>	2016
92	<i>Polythlipta divaricata</i>	2016
93	<i>Prooedema inscisalis</i>	2016

94	<i>Prophantis adusta</i>	2016
95	<i>Pycnarmon lactiferalis</i>	2016
96	<i>Pygospila tyres</i>	2016
97	<i>Pyralis pictalis</i>	2016
98	<i>Rhagoba octomaculalis</i>	2016
99	<i>Rhimphalea trogusalis</i>	2016
100	<i>Sameodes cancellalis</i>	2016
101	<i>Sansarea circulifera</i>	2017
102	<i>Scopelodes testacea</i>	2017
103	<i>Setora fletcheri</i>	2017
104	<i>Setora postornata</i>	2017
105	<i>Spoladea recurvalis</i>	2016
106	<i>Strepsinoma croesusalis</i>	2016
107	<i>Susica himalayana</i>	2017
108	<i>Syllepte gastralis</i>	2016
109	<i>Talanga sexpunctalis</i>	2016
110	<i>Tennya propolia</i>	2017
111	<i>Terastia egialealis</i>	2016
112	<i>Thosea magna</i>	2017
113	<i>Tyspanodes linealis</i>	2016
114	<i>Tyspanodes nigrolinealis</i>	2016
115	<i>Uncobotyodes patulalis</i>	2016
116	<i>Uthinia albisignalis</i>	2016
117	<i>Vanlangia uniformis</i>	2017
118	<i>Vitessa suradeva</i>	2016
119	<i>Zitha torridalis</i>	2016
Cicadas		
1	<i>Haphsa sulaiyai</i>	2016
2	<i>Hueschys sanguinea</i>	2016
3	<i>Polyneura ducalis</i>	2016
4	<i>Talainga binghami</i>	2016
5	<i>Tanna thalia</i>	2016
Bryophytes (Mosses and Liverworts)		
1	<i>Scapania verrucosa</i>	2012
2	<i>Southbya gollanii</i>	2012

Annexure 2: List of Protected Species by National Legislations

(Forest and Nature Conservation Act 1995 - Schedule I & Forest and Nature Conservation Rules and Regulations 2017)

S.N.	Species	Legislation
Mammals		
1	Asian Elephant	Schedule I & FNCRR
2	Clouded Leopard	Schedule I & FNCRR
3	Golden Langur	Schedule I & FNCRR
4	Musk Deer	Schedule I & FNCRR
5	Pangolin	Schedule I & FNCRR
6	Pigmy Hog	Schedule I & FNCRR
7	Snow Leopard	Schedule I & FNCRR
8	Takin	Schedule I & FNCRR
9	Tiger	Schedule I & FNCRR
10	Wild Buffalo	Schedule I & FNCRR
11	Spotted deer (Cheetal)	Schedule I & FNCRR
12	Gaur	Schedule I & FNCRR
13	Leopard	Schedule I & FNCRR
14	Leopard Cat	Schedule I & FNCRR
15	Himalayan Black Bear	Schedule I & FNCRR
16	Red Panda	Schedule I & FNCRR
17	Serow	Schedule I & FNCRR
18	Rhino	FNCRR
19	Hispid hare	FNCRR
20	Slow loris	FNCRR
21	Blue sheep	FNCRR
22	Sambhar	FNCRR
23	Flying squirrel	FNCRR
Plants		
1	<i>Aquilaria malaccensis</i>	Schedule I & FNCRR
2	<i>Gentiana crassuloides</i>	Schedule I & FNCRR
3	<i>Lloydia yunnanensis</i>	Schedule I & FNCRR
4	<i>Meconopsis grandis</i>	Schedule I & FNCRR
5	<i>Taxus baccata</i>	Schedule I & FNCRR
6	<i>Panax pseudo-ginseng</i>	Schedule I & FNCRR

Fungi		
1	<i>Ophiocordyceps sinensis</i>	Schedule I & FNCRR
Fish		
1	Golden Mahseer	Schedule I & FNCRR
Butterfly		
1	Bhutan Swallowtail	FNCRR
Birds		
1	White-bellied Heron	FNCRR
2	Baer's Pochard	FNCRR
3	White-rumped Vulture,	FNCRR
4	Red-headed Vulture	FNCRR
5	Black Necked Crane	Schedule I & FNCRR
6	Rufous-Necked Hornbill	Schedule I & FNCRR
7	Raven	Schedule I & FNCRR
8	Monal Pheasant	Schedule I & FNCRR
9	Peacock Pheasant	Schedule I & FNCRR
10	Dark-rumped Swift	FNCRR
11	Greater Spotted Eagle	FNCRR
12	Imperial Eagle	FNCRR
13	Chestnut-breasted Partridge	FNCRR
14	Wood Snipe	FNCRR
15	Pallas's Fish Eagle	FNCRR
16	Great Slaty Woodpecker	FNCRR
17	Grey-crowned Prinia	FNCRR
18	Hodgson's Bushcha	FNCRR
19	Beautiful Nuthatch	FNCRR
20	Blyth's Tragopan	FNCRR
21	Great Slaty Woodpecker	FNCRR
22	Grey-crowned Prinia	FNCRR
23	Cinereous Vulture	FNCRR
24	Blyth's Kingfisher	FNCRR
25	Ferruginous Duck	FNCRR
26	Great Hornbill	FNCRR
27	Japanese Quail	FNCRR
28	Black-necked Stork	FNCRR
29	Ward's Trogon	FNCRR
30	Lesser Fish Eagle	FNCRR

31	Yellow-rumped Honeyguide	FNCRR
32	Eurasian Curlew	FNCRR
33	Rufous-throated Wren Babbler	FNCRR
34	Wedge-billed Wren Babbler	FNCRR
35	River Tern	FNCRR
36	River Lapwing	FNCRR

Annexure 3: List of Threatened Species

S.No.	Species	Status
Fishes		
1	<i>Aborichthys garoensis</i>	Vulnerable
2	<i>Cirrhinus cirrhosus</i>	Vulnerable
3	<i>Cyprinion semiplotum</i>	Vulnerable
4	<i>Cyprinus carpio</i>	Vulnerable
5	<i>Devario assamensis</i>	Vulnerable
6	<i>Pseudecheneis sirenica</i>	Vulnerable
7	<i>Schistura inglisi</i>	Vulnerable
8	<i>Schizothorax richardsonii</i>	Vulnerable
9	<i>Tor putitora</i>	Endangered
10	<i>Pterocryptis barakensis</i>	Endangered
11	<i>Clarias magur</i>	Endangered
Birds		
1	Chestnut-breasted Partridge	Vulnerable
2	Blyth's Tragopan	Vulnerable
3	Common Pochard	Vulnerable
4	Long-tailed Duck	Vulnerable
5	Woolly-necked Stork	Vulnerable
6	Lesser Adjutant	Vulnerable
7	Indian Spotted Eagle	Vulnerable
8	Greater Spotted Eagle	Vulnerable
9	Eastern Imperial Eagle	Vulnerable
10	Black-necked Crane	Vulnerable
11	Wood Snipe	Vulnerable
12	Dark-rumped Swift	Vulnerable
13	Great Hornbill	Vulnerable
14	Rufous-necked Hornbill	Vulnerable
15	Wreathed Hornbill	Vulnerable
16	Great Slaty Woodpecker	Vulnerable
17	Grey-crowned Prinia	Vulnerable
18	Beautiful Nuthatch	Vulnerable
19	Grey-sided Thrush	Vulnerable
20	Hodgson's Bushchat	Vulnerable
21	Kashmir Flycatcher	Vulnerable

22	Rustic Bunting	Vulnerable
23	White-winged Duck	Endangered
24	Pallas's Fish Eagle	Endangered
25	Egyptian Vulture	Endangered
26	Steppe Eagle	Endangered
27	Baer's Pochard	Critically Endangered
28	White-bellied Heron	Critically Endangered
29	White-rumped Vulture	Critically Endangered
30	Red-headed Vulture	Critically Endangered
Mammals		
1	Clouded Leopard	Vulnerable
2	Common Leopard	Vulnerable
3	Snow Leopard	Vulnerable
4	Asian small-clawed Otter	Vulnerable
5	Smooth-coated Otter	Vulnerable
6	Asiatic Black Bear	Vulnerable
7	Binturong or Bearcat	Vulnerable
8	Gaur	Vulnerable
9	Takin	Vulnerable
10	Sambar	Vulnerable
11	Indian Rhinoceros	Vulnerable
12	Capped Langur	Vulnerable
13	Bengal Slow Loris	Vulnerable
14	Red Panda	Endangered
15	Dhole	Endangered
16	Tiger	Endangered
17	Wild Water Buffalo	Endangered
18	Hog Deer	Endangered
19	Alpine Musk Deer	Endangered
20	Himalayan Musk Deer	Endangered
21	Hispid Hare	Endangered
22	Arunachal Macaque	Endangered
23	Golden Langur	Endangered
24	Asian Elephant	Endangered
25	Pygmy Hog	Critically Endangered
26	Chinese Pangolin	Critically Endangered
Amphibians and Reptiles		
1	<i>Kachuga kachuga</i>	Critically Endangered

2	<i>Gavialis gangeticus</i>	Critically Endangered
3	<i>Indotestudo elongata</i>	Endangered
4	<i>Cuora mouhotii</i>	Endangered
5	<i>Kachuga dhongoka</i>	Endangered
6	<i>Pangshura sylhetensis</i>	Endangered
7	<i>Chitra indica</i>	Endangered
8	<i>Xenophrys cf. nankiangensis</i>	Vulnerable
9	<i>Python molurus</i>	Vulnerable
10	<i>Oligodon juglandifer</i>	Vulnerable
11	<i>Ophiophagus hannah</i>	Vulnerable
12	<i>Melanochelys tricarinata</i>	Vulnerable
13	<i>Morenia petersi</i>	Vulnerable
14	<i>Python bivittatus</i>	Vulnerable
15	<i>Geoclemys hamiltonii</i>	Vulnerable
16	<i>Cuora amboinensis</i>	Vulnerable
17	<i>Hardella thurjii</i>	Vulnerable
18	<i>Nilssonia hurum</i>	Vulnerable
Butterfly		
1	<i>Bhutanitis ludlowi</i>	Vulnerable
Plants		
1	<i>Eulophia stenopetala</i>	Extinct
2	<i>Brugmansia suaveolens</i>	Extinct in the Wild
3	<i>Aquilaria malaccensis</i>	Critically Endangered
4	<i>Astragalus paroensis</i>	Critically Endangered
5	<i>Bulbophyllum leopardinum var. tuberculatum</i>	Critically Endangered
6	<i>Ceropegia dorjei</i>	Critically Endangered
7	<i>Cheirostylis sherriffii</i>	Critically Endangered
8	<i>Meconopsis bhutanica</i>	Critically Endangered
9	<i>Nardostachys jatamansi</i>	Critically Endangered
10	<i>Onosma griersonii</i>	Critically Endangered
11	<i>Ophiorrhiza longii</i>	Critically Endangered
12	<i>Oreorchis sanguinea</i>	Critically Endangered
13	<i>Paphiopedilum fairrieianum</i>	Critically Endangered
14	<i>Saurauia punduana</i>	Critically Endangered
15	<i>Sorbus lingshiensis</i>	Critically Endangered
16	<i>Androsace hemisphaerica</i>	Endangered
17	<i>Bistorta griersonii</i>	Endangered
18	<i>Bulleyia yunnanensis</i>	Endangered

19	<i>Carex nigra</i> subsp. <i>drukyulensis</i>	Endangered
20	<i>Ceropegia bhutanica</i>	Endangered
21	<i>Cypripedium elegans</i>	Endangered
22	<i>Cypripedium himalaicum</i>	Endangered
23	<i>Hoya bhutanica</i>	Endangered
24	<i>Hypericum sherriffii</i>	Endangered
25	<i>Ilex venulosa</i>	Endangered
26	<i>Illicium griffithii</i>	Endangered
27	<i>Isodon atroruber</i>	Endangered
28	<i>Meconopsis superba</i>	Endangered
29	<i>Neopicrorhiza minima</i>	Endangered
30	<i>Paphiopedilum spicerianum</i>	Endangered
31	<i>Paphiopedilum venustum</i>	Endangered
32	<i>Pedicularis sanguilimbata</i>	Endangered
33	<i>Strobilanthes accrescens</i> subsp. <i>accrescens</i>	Endangered
34	<i>Taxus wallichiana</i>	Endangered
35	<i>Sorbus rinzenii</i>	Endangered
36	<i>Aglaiia perviridis</i>	Vulnerable
37	<i>Bambusa clavata</i>	Vulnerable
38	<i>Buddleja bhutanica</i>	Vulnerable
39	<i>Corallo-discus cooperi</i>	Vulnerable
40	<i>Cupressus macrocarpa</i>	Vulnerable
41	<i>Cycas pectinata</i>	Vulnerable
42	<i>Cymbopogon bhutanicus</i>	Vulnerable
43	<i>Cypripedium cordigerum</i>	Vulnerable
44	<i>Drepanostachyum annulatum</i>	Vulnerable
45	<i>Jacaranda mimosifolia</i>	Vulnerable
46	<i>Malaxis muscifera</i>	Vulnerable
47	<i>Pedicularis griniiformis</i>	Vulnerable
48	<i>Picea brachytyla</i>	Vulnerable
49	<i>Rhododendron dalhousiae</i> var. <i>rhabdotum</i>	Vulnerable
50	<i>Saxifraga vacillans</i>	Vulnerable

