BIODIVERSITY CONSERVATION

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BIODIVERSITY CONSERVATION

- In situ
  - National Park
  - Sanctuaries
  - Biosphere Reserves
  - Sacred Areas
- Ex situ
  - Seed bank
  - Gene banks
  - Long term captive breeding
  - Animal translocations
  - Tissue culture
  - Cryopreservation
  - Botanical gardens
  - Zoos

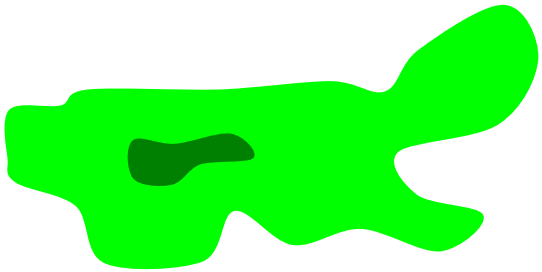
Preservation: Herbarium and Museums

In situ Conservation

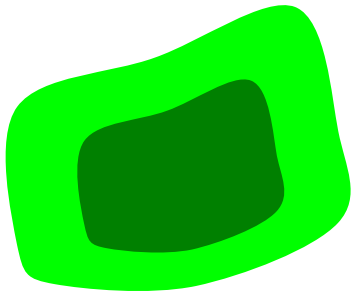
- About 4% of the total geographical area of the country is used for *in situ* conservation. The following methods are presently used for *in situ* conservation.

In-situ conservation	Number available
Biosphere reserves	18
National parks	104
Wild-life sanctuaries	543
Biodiversity hotspots	4

- Biosphere reserves cover very large areas, often more than 5000 km^2. They are used to protect species for a long time. Currently, there are 18 Biosphere Reserves in India.

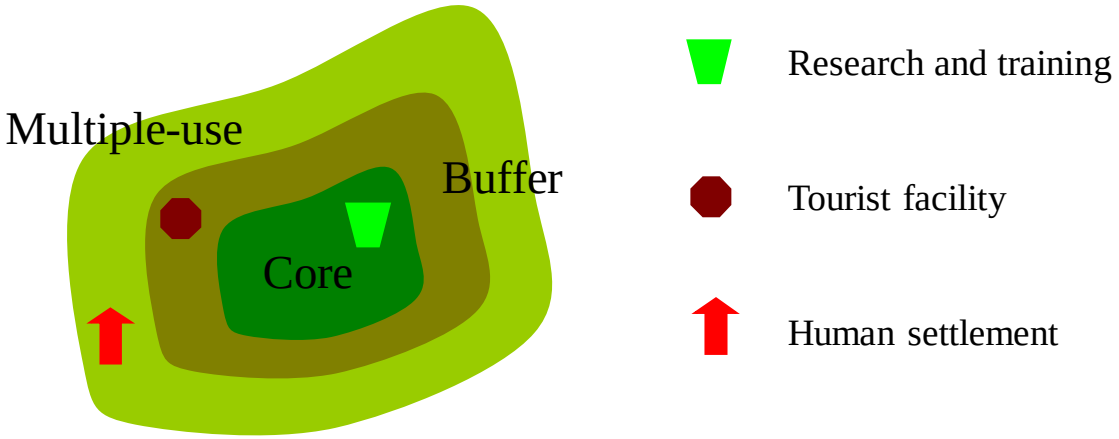


Total area: 39 ha; core: 2



Total area: 42 ha; core: 25

Name	State
Nanda Devi	Uttarakhand
Nokrek	Meghalaya
Manas	Assam
Sundarban	West Bengal



- A national park is an area dedicated for the conservation of wildlife along with its environment. A national park is an area which is used to conserve scenery, natural and historical objects. It is usually a small reserve covering an area of about 100 to 500 square kilometers.
- Within biosphere reserves, one or more national parks may also exist.
- Currently, there are 104 national parks in India.
- A national park is an area which is strictly reserved for the betterment of the wildlife and where activities like forestry, grazing on cultivation are not permitted. In these parks, even private ownership rights are not allowed.
- Their boundaries are well marked and circumscribed. They are usually small reserves spreading in an area of 100 Sq. km. to 500 sq. km. In national parks, the emphasis is on the preservation of a single plant or animal species.

Name	State	Important wildlife
Kaziranga National Park	Assam	One-horned rhino
Gir National Park	Gujarat	Asiatic lions
Bandipur	Karnataka	Tiger, Elephant
Dachigam	J & K	Hangul
Kanha	M.P	Tiger
Periyar	Kerala	Tiger, elephant
Ranthambore National Park	Rajasthan	Tiger

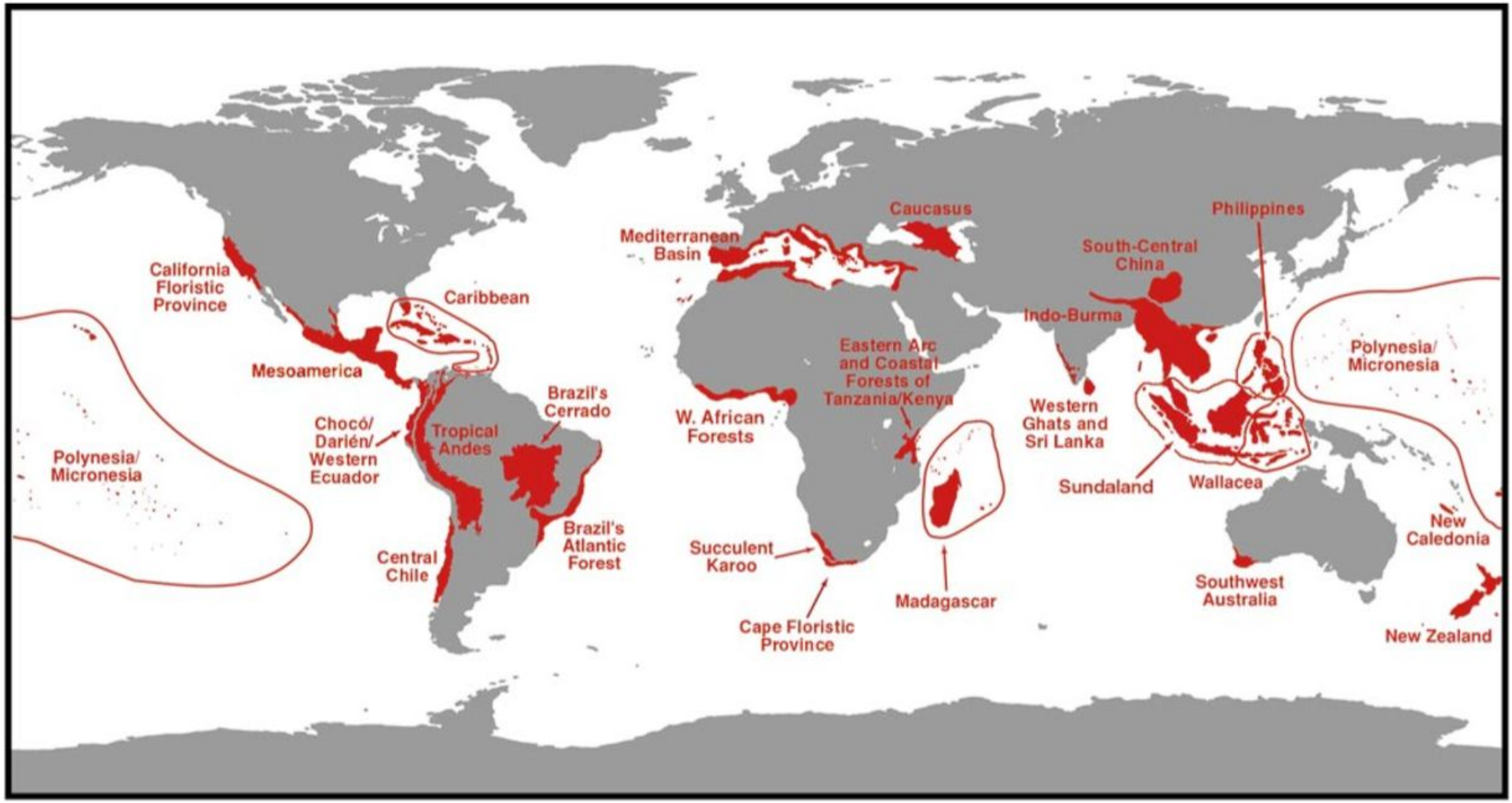
- A wildlife sanctuary is an area which is reserved for the conservation of animals only.
- A sanctuary is a protected area which is reserved for the conservation of only animals and human activities like harvesting of timber, collecting minor forest products and private ownership rights are allowed as long as they do not interfere with well-being of animals.
- Boundaries of sanctuaries are not well defined and controlled biotic interference is permitted, e.g., tourist activity.
- Currently, there are 543 wild sanctuaries in India.

Name	State	Major wildlife
Hazaribagh sanctuary	Jharkhand	Tiger, leopard
Ghana Bird sanctuary	Rajasthan	300 species of Birds
Sultanpur Bird Sanctuary	Haryana	Migratory birds
Abohar Wild life Sanctuary	Punjab	Black buck
Nal sarovar Bird Sanctuary	Gujarat	Water birds
Mudumalai Wild life Sanctuary	Tamil Nadu	Tiger, elephant, leopard
Vedanthangal Bird Sanctuary	Tamil Nadu	Water birds

Hotspots

India: 4 Hotspots
The Himalaya
The Western Ghats
The North-East
The Nicobar Islands

- Norman Myers-first to develop concept
- Highly diverse and more endemic area
- Criteria
  1. Species Endemism: To qualify as a hotspot, an area must contain at least 0.5% or 1,500 of the world's 300,000 plant species as endemic. (Infact, 15 of the 25 hotspots contain at least 2,500 endemic plant species, and 10 of them at least 5,000)
  2. Degree of Threat: To qualify, a hotspot should have lost 70% or more of its primary vegetation, this being the form of habitat that usually contains the most species, especially endemics. (Eleven hot spots have already lost at least 90% and three have lost 95%.)
- 25 Hotspots 1.4% Area – 44% Plants and 35% Vertebrates


California Floristic Province
Caribbean
Mesoamerica
Chocó/ Darién/ Western Ecuador
Tropical Andes
Brazil's Cerrado
Brazil's Atlantic Forest
Central Chile
Polynesia/ Micronesia
Mediterranean Basin
Caucasus
W. African Forests
Eastern Arc and Coastal Forests of Tanzania/Kenya
Succulent Karoo
Cape Floristic Province
Madagascar
Philippines
South-Central China
Indo-Burma
Western Ghats and Sri Lanka
Sundaland
Wallacea
Polynesia/ Micronesia
New Caledonia
Southwest Australia
New Zealand

Advantages of in-situ conservation:

1. The flora and fauna live in natural habitats without human interference.
2. The life cycles of the organisms and their evolution progresses in a natural way.
3. In-situ conservation provides the required green cover and its associated benefits to our environment.
4. It is less expensive and easy to manage.
5. The interests of the indigenous people are also protected.

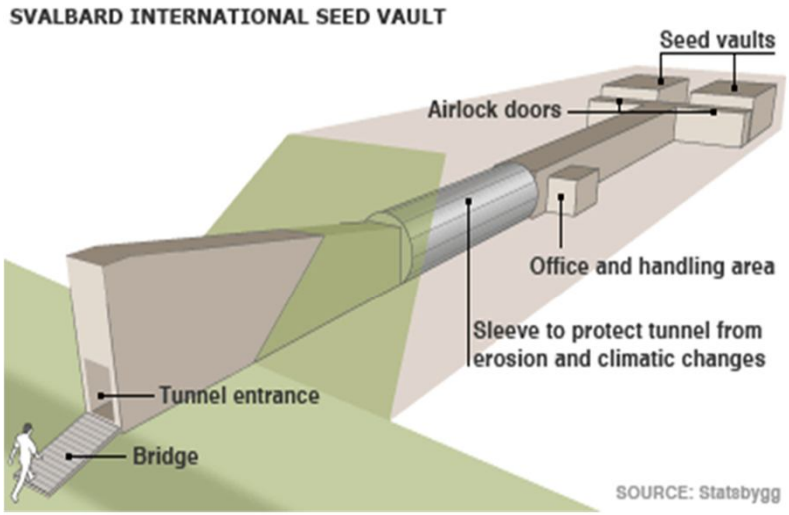
EX-SITU CONSERVATION

- Ex-situ conservation is the preservation of components of biological diversity outside their natural habitats. This involves conservation of genetic resources, as well as wild and cultivated or species, and draws on a diverse body of techniques and facilities. Such strategies include establishment of botanical gardens, zoos, conservation strands and gene, pollen seed, seedling, tissue culture and DNA banks.

i. Seed gene bank:

These are cold storages where seeds are kept under controlled temperature and humidity for storage and this is easiest way to store the germ plasma of plants at low temperature. Seeds preserved under controlled conditions (minus temperature) remain viable for long durations of time.

Eg. Svalbard Global Seed Vault, Norway



BBC

Bergen Nat Acc of Arts

ii. Gene bank:

Genetic variability also is preserved by gene bank under normal growing conditions. These are cold storages where germ plam are kept under controlled temperature and humidity for storage; this is an important way of preserving the genetic resources.

iii. Cryopreservation:

This is the newest application of technology for preservation of biotic parts. This type of conservation is done at very low temperature (-196°C) in liquid nitrogen. The metabolic activities of the organisms are suspended under low temperature, which are later used for research purposes.

iv. Tissue culture bank:

Cryopreservation of disease free meristems is very helpful. Long term culture of excised roots and shoots are maintained. Meristem culture is very popular in plant propagation as it's a virus and disease free method of multiplication.

v. Long term captive breeding:

The method involves capture, maintenance and captive breeding on long term basis of individuals of the endangered species which have lost their habitat permanently or certain highly unfavorable conditions are present in their habitat.

vi. Botanical gardens:

A botanical garden is a place where flowers, fruits and vegetables are grown. The botanical gardens provide beauty and calm environment. Most of them have started keeping exotic plants for educational and research purposes.

vii. Animal Translocation:

Release of animals in a new locality which come from anywhere else.

Translocation is carried in following cases:

1. When a species on which an animal is dependent becomes rare.
2. When a species is endemic or restricted to a particular area.
3. Due to habit destruction and unfavorable environment conditions.
4. Increase in population in an area.

viii. Zoological Gardens:

In zoos wild animals are maintained in captivity and conservation of wild animals (rare, endangered species). The oldest zoo, the Schonbrumm zoo which exists today also, was established in VIENNA in 1759.

In India, the 1st zoo came into existence at BARRACKPORE in 1800. In world there are about 800 zoos. Such zoos have about 3000 species of vertebrates. Some zoos have undertaken captive breeding programmes.

Advantages of ex-situ preservation:

1. It is useful for declining population of species.
2. Endangered animals on the verge of extinction are successfully breeded.
3. Threatened species are breeded in captivity and then released in the natural habitats.
4. Ex-situ centres offer the possibilities of observing wild animals, which is otherwise not possible.
5. It is extremely useful for conducting research and scientific work on different species.

Important Wildlife Protection Projects by Indian Government

Project Tiger

One of the most successful wildlife conservation ventures 'Project Tiger' which was initiated way back in 1972, has not only contributed to the conservation of tigers but also of the entire ecosystem.

This project is sponsored by Ministry of Environment Forest and Climate Change.

About 47 tiger reserves situated in more than 17 regions including Corbett National Park and Ranthambore National Park are part of this project which conducts assessments of number of tigers, their habitat, hunting habits under the supervision of the Tiger Task Force.

Project Tiger has seen significant success in recovery of the habitat and increase in the population of the tigers in the reserve areas, from a scanty 268 in 9 reserves in 1972 to above 1000 in 28 reserves in 2006 to 2000+ tigers in 2016.

Project Elephant

Initiated in 1992 by the Government of India Project Elephant aims at conserving elephants and their habitat and of migratory routes by developing scientific and planned management measures.

Under the project welfare of the domestic elephants is also considered, issues like mitigation of human-elephant conflict are also taken care of. The project's endeavour is to strengthen the measures for protection of elephants against poachers and unnatural death.

Crocodile Conservation Project

This project is yet another successful venture by Government of India to conserve the Indian Crocodiles, whose species were on the verge of extinction once. The project also contributes towards the conservation in a plethora of related fields. The main objectives of the crocodile project is to protect the remaining population of crocodiles and their natural habitat by establishing sanctuaries; to promote captive breeding; to improve management; and to involve the local people in the project intimately. It is worth noticing that with the initiation of Crocodile Conservation Project, 4000 gharial/aligator, 1800 mugger/crocodile and 1500 saltwater crocodiles could be restocked.

UNDP Sea Turtle Project

With an objective to conserve the Olive Ridley Turtles, the UNDP Sea Turtle Project was initiated by Wildlife Institute of India, Dehradun as the Implementing Agency in November 1999.

The project is for 10 coastal state in India especially Odisha where it has contributed towards the preparation of a map of breeding sites of Sea Turtles; identification of breeding places and habitats along the coast line, and migratory routes taken by Sea Turtles. The project also helped in the development of guidelines to safeguard the turtle mortality rate and for tourism in sea turtle areas. Amongst the major achievements of the project is the demonstration of use of Satellite Telemetry to locate the migratory route of sea turtles in the sea.

- Apart from these projects, GOI also has been handling projects like Vulture Conservation and India Rhino Vision (IRV) 2020.