

1. Conservation of Biodiversity or wildlife of India

Conservation is the protection, preservation, management, or restoration of wildlife and natural resources such as forests and water. Through the conservation of biodiversity and the survival of many species and habitats which are threatened due to human activities can be ensured. There is an urgent need, not only to manage and conserve the biotic wealth, but also restore the degraded ecosystems.

Types of Conservation

Conservation can broadly be divided into two types:

1. In-situ conservation 2. Ex-situ conservation

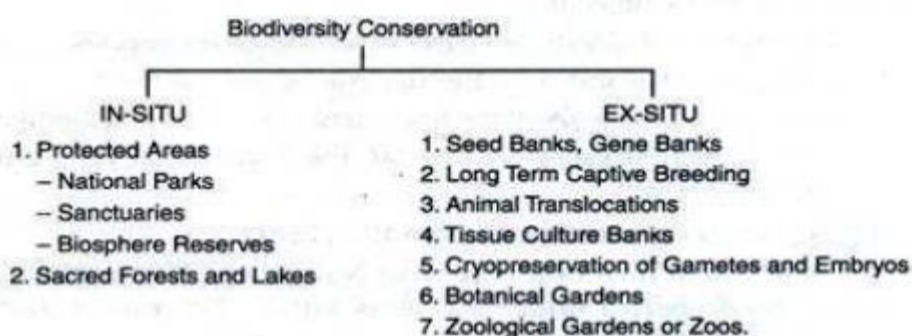


Table. List of some major National Parks of India

S.No.	Name	State	Established	Area (in km ²)
1.	Corbett National Park	Uttarakhand	1921	1318.5
2.	Dudhwa National Park	Uttar Pradesh	1977	490.29
3.	Gir National Park	Gujarat	1965	258.71
4.	Kanha National Park	Madhya Pradesh	1955	940
5.	Kanger Ghati National Park (Kanger Valley)	Chhattisgarh	1982	200
6.	Kaziranga National Park	Assam	1974	471.71
7.	Nanda Devi National Park	Uttarakhand	1982	630.33

8.	Sariska Park	National	Rajasthan	1955	866
9.	Silent National Park	Valley	Kerala	1980	237
10.	Sundarbans National Park		West Bengal	1984	1330.12

(a) In-situ Conservation

In-situ conservation is on site conservation of genetic resources in natural populations of plant or animal species, such as forest genetic resources in natural populations of tree species. It is the process of protecting an endangered plant or animal species in its natural habitat, either by protecting or cleaning up the habitat itself, or by defending the species from predators. In-situ conservation is being done by declaring area as protected area.

In India following types of natural habitats are being maintained:

1. National Park 2. Wildlife Sanctuary 3. Biosphere Reserves

India has over **600 protected area** which includes over **90 national parks**, over **500 animals sanctuaries** and **15 biosphere Reserves**

1. National Park

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. 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.

2. Wildlife Sanctuaries

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.

3. Biosphere Reserves

It is a special category of protected area where human population also forms a part of the system. They are large protected area of usually more than 5000 sq. Km. A biosphere reserves has 3 parts- core, buffer and transition zone.

1. Core zone is the inner zone; this is undisturbed and legally protected area.
2. Buffer zone lies between the core and transition zone. Some research and educational activities are permitted here.
3. Transition zone is the outermost part of biosphere reserves. Here cropping, forestry, recreation, fishery and other activities are allowed.

Table. List of some major Wildlife Sanctuaries of India

S.No.	Name	State	Established	Area (in km²)
1.	Ghana Bird Sanctuary	Rajasthan	1982	28.73
2.	Hazaribag Wildlife Sanctuary	Jharkhand	1954	183.89
3.	Mudumalai Wildlife Sanctuary	Tamil Nadu	1940	321.55
4.	Jaldapara Wildlife Sanctuary	West Bengal	2012	216
5.	Mount Abu Wildlife Sanctuary	Rajasthan	1960	288.84

6.	Anamalai Wildlife Sanctuary (Indira Gandhi Wildlife Sanctuary and National Park)	Tamil Nadu	1989	117.10
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The main functions of biodiversity reserves are:

1. **Conservation:** To ensure the conservation of ecosystem, species and genetic resources.
2. **Development:** To promote economic development, while maintaining cultural, social and ecological identity.

Table. List of some major Biosphere Reserves of India

S.No.	Name	State	Established	Area (in k
1.	Nanda Devi	Uttarakhand	1982	5,860.69
2.	Manas	Assam	1990	2837
3.	Gulf of Mannar	Tamil Nadu	1980	10,500
4.	Great Nicobar	Andaman and Nicobar Islands	1989	885
5.	Panchmarhi	Madhya Pradesh	1999	4,926.28

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.

(b) 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.

1) 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.

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

3) 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.

4) 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.

5) 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.

6) 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.

7) Animal Translocation: Release of animals in a new locality which come from anywhere

2. Extinct species: it is the disappearance of a species from earth when its last surviving members die. Organic evolution not only creates new species but also eliminates some old ones. This is a natural process. Man, being the most powerful species in the biosphere, has been responsible for the elimination of many species by their overexploitation.

Loss has been particularly heavy during the last one hundred years. On the average, one species of mammals has disappeared from earth every year since 1900. Besides, mammals, numerous species of other animals have been driven to extinction. Extinction of each wild population erases its gene pool forever. About 10% of living species are in danger of extinction. This includes about 25000 plant species, some 1000 vertebrate species and some subspecies and many invertebrate species (coral, insects, molluscs).

IUCN Red List of Threatened Species, also called **IUCN Red List**, one of the most well-known objective assessment systems for classifying the status of plants, animals, and other organisms threatened with extinction. The International Union for Conservation of Nature (IUCN) unveiled this assessment system in 1994. It contains explicit criteria and categories to classify the conservation status of individual species on the basis of their probability of extinction.

The IUCN system uses a set of five quantitative criteria to assess the extinction risk of a given species. In general, these criteria consider:

1. The rate of **population** decline
2. The geographic range
3. Whether the species already possesses a small population size
4. Whether the species is very small or lives in a restricted area
5. Whether the results of a **quantitative analysis** indicate a high probability of extinction in the wild.

After a given species has been thoroughly evaluated, it is placed into one of several categories. (The details of each have been condensed to highlight two or three of the category's most salient points below.) In addition, three of the categories (CR, **EN**, and VU) are contained within the broader notion of "threatened." The IUCN Red List of Threatened Species recognizes several categories of species status:

1. **Extinct (EX):** a designation applied to species in which the last individual has died or where systematic and time-appropriate surveys have been unable to log even a single individual

2. **Extinct in the Wild (EW):** a category containing those species whose members survive only in captivity or as artificially supported populations far outside their historical geographic range
3. **Critically Endangered (CR):** a category containing those species that possess an extremely high risk of extinction as a result of rapid population declines of 80 to more than 90 percent over the previous 10 years (or three generations), a current population size of fewer than 50 individuals, or other factors
4. **Endangered (EN):** a designation applied to species that possess a very high risk of extinction as a result of rapid population declines of 50 to more than 70 percent over the previous 10 years (or three generations), a current population size of fewer than 250 individuals, or other factors
5. **Vulnerable (VU):** a category containing those species that possess a very high risk of extinction as a result of rapid population declines of 30 to more than 50 percent over the previous 10 years (or three generations), a current population size of fewer than 1,000 individuals, or other factors



Asiatic Lion



Pink headed duck



Snow leopard



Blackbuck



One horned Rhinoceros



Kashmir Stag



Indian Bison



Ganga river Dolphin



Gharial



Vultures

