

HABITAT DESTRUCTION

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HABITAT DESTRUCTION



The process in which natural habitat is rendered functionally unable to support the species present. In this process, the organisms which previously used the site are displaced or destroyed, reducing biodiversity



HABITAT DESTRUCTION

Habitat destruction that results from the expansion of human populations and human activities.

The major threat to biological diversity is loss of habitat and the most important means of protecting biological diversity is habitat preservation.

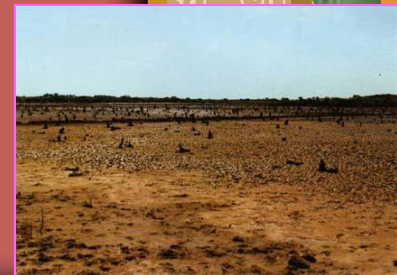
Habitat loss is known to be the primary threat to the majority of plants and animals currently facing extinction.

In many areas of the world, particularly on islands and in locations where human population density is high, most original habitat has been destroyed.



Mangroves

- ❖ Mangroves are extremely important breeding grounds and feeding areas for shrimp and fish
- ❖ In Australia two-thirds of the species by commercial fisherman depend to some degree on the mangrove ecosystem
- ❖ Their great economic value, mangroves are cleared for rice cultivation and commercial shrimp and prawn hatcheries particularly in Southeast Asia, where as much as 15% of the mangrove area has been removed for aquaculture.



Mangroves

- ❖ Mangroves have also been severely degraded by over collecting wood for fuel, construction poles and timber
- ❖ The loss of mangroves is extensive in some parts of South and Southeast Asia
- ❖ The percentage of mangroves lost is particularly high for India (85%), Thailand (87%), Pakistan (78%) & Bangladesh (73%).



Mangroves

Country	Period of record	Estimated original mangrove area	Estimated present mangrove area	Percentage
Cuba	1969-1989	476000	448000	94
Bangladesh	1963-1990	685000	587000	86
Guatemala	1965-1978	58000	50000	86
Malaysia	1979-1986	113000	89000	79
Ecuador	1966-1989	235000	177500	76
Thailand	1961-1993	300000	219200	73
Vietnam	1969-1990	425000	286400	67
U.S.A	1958-1983	260000	175000	67
Colombia	1976-1989	480000	307000	64
Indonesia	1969-1986	4220000	2176000	52
Philippines	1968-1995	448000	140000	31
Singapore	1922-1989	700	180	26
Puerto Rico	1930-1985	26300	3000	11
South India (Kerala)	1911-1989	70000	250	4

MANGROVES



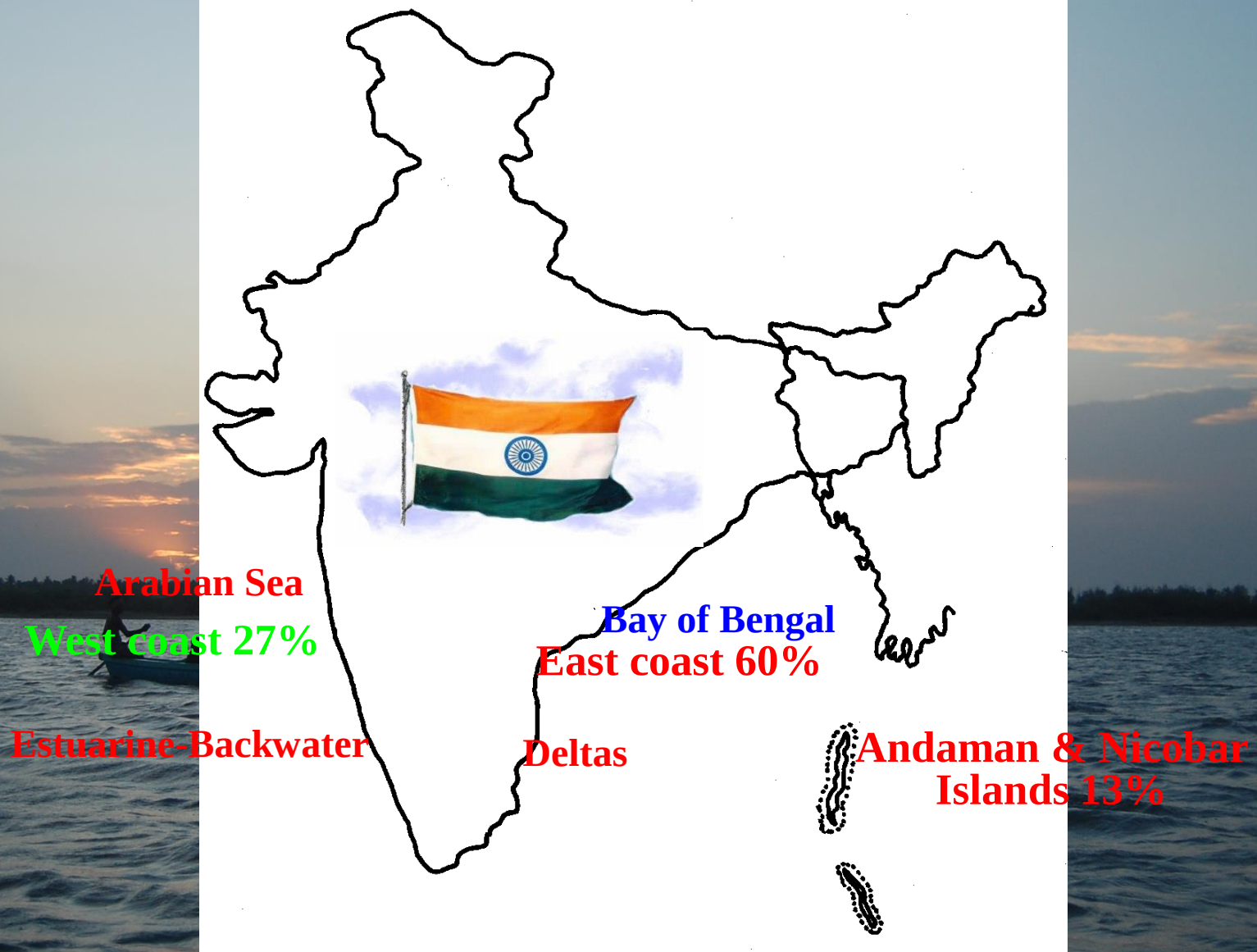
Total Area	4,693 km ²
Species Recorded	39
Associated Flora	420
Associated Fauna	1862
East Coast	57%
West coast	23%
Andaman & Nicobar Islands	20%



Rhizophora x annamalayana Kathir.

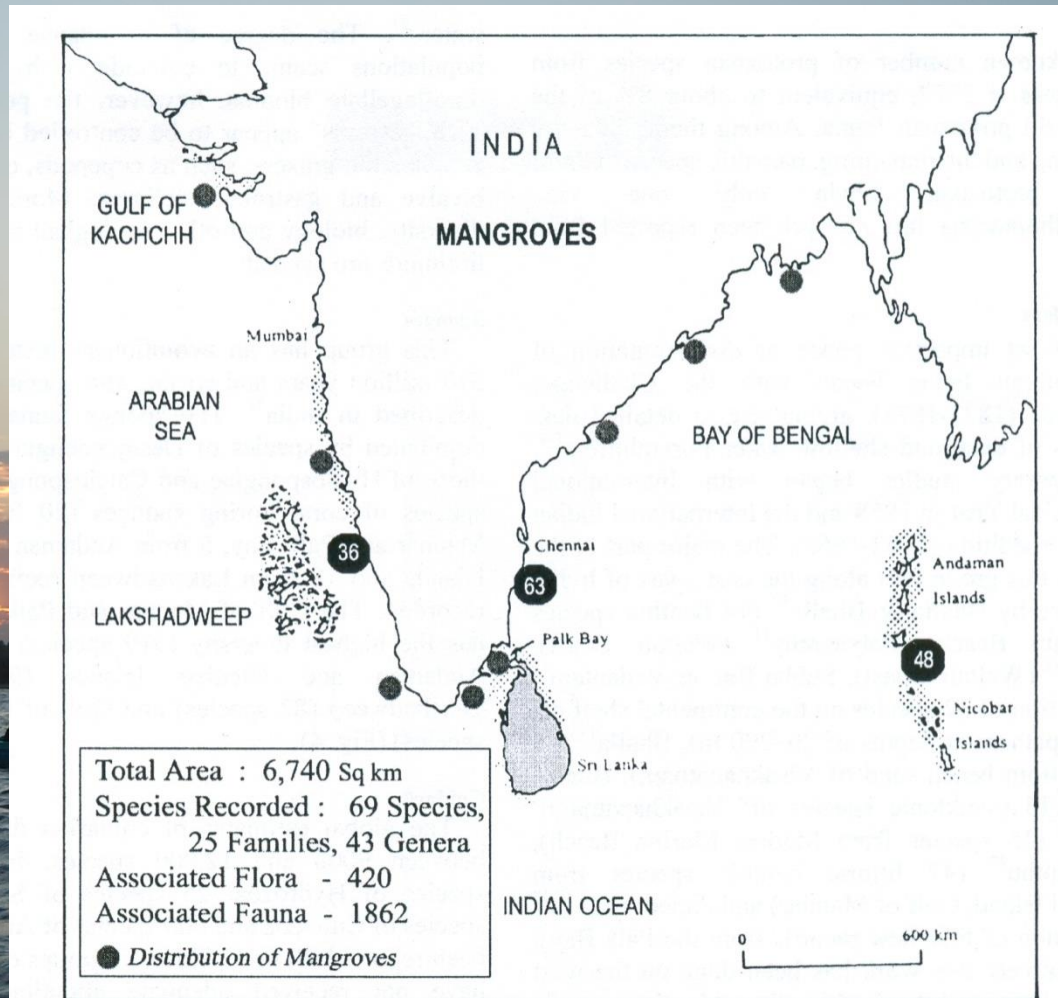


MANGROVES



Total area 4,693 km² (3% of world; 8% of Asia)

MANGROVES DISTRIBUTION IN INDIA



Venkataraman and Wafar, (2005)

MANGROVES ASSOCIATED BIODIVERSITY

- Total species = 4,011
- Floral = 920
- Fauna = 3,091

India is only country
with rich
biodiversity.

No.	Groups	No. of Species
<i>Flora</i>		
1	Mangroves	39
2	Mangrove associates	86
3	Sea grasses	11
4	Marine algae	557
5	Bacteria	69
6	Fungi	103
7	Actinomycetes	23
8	Lichens	32
<i>Fauna</i>		
9	Prawns and lobsters	55
10	Crabs	138
11	Insects	707
12	Molluscs	305
13	Other invertebrates	745
14	Fish parasites	7
15	Fin fish	543
16	Amphibians	13
17	Reptiles	84
18	Birds	426
19	Mammals	68
Total number of species		4011

STATE-WISE COVER OF MANGROVE FORESTS OF INDIA IN KM²

State/UT	Year of assessment		Change of forest cover	
	2005	2007	2003-2005	2005-2007
Andhra Pradesh	329	353	0	-1
Goa	16	17	0	1
Gujarat	936	1046	20	55
Karnataka	3	3	0	0
Kerala	8	5	0	0
Maharastra	158	186	0	0
Orissa	203	221	0	4
Tamil Nadu	35	39	0	3
West Bengal	2118	2152	-2	16
Andaman and Nicobar	637	615	-21	-20
Daman and Diu	1	1	0	0
Pondicherry	1	1	0	0
Total	4445	4639	-3	58

(FAO, 2007)



Coral Reefs

- ❖ Tropical coral reefs contain an estimated one third of the oceans fish species in only 0.2% of its surface area
- ❖ Already 10% of all coral reefs have been destroyed and as many as 30% more could be destroyed in the next few decades
- ❖ Larger areas of coral reefs have been destroyed by over fishing, over harvesting, pollution and the introduction of invasive species
- ❖ The most severe destruction is taking place in the Philippines, where a staggering 90% of the reefs are dead or dying





Coral Reefs



- ❖ The main reasons are pollution, which kills the coral directly or allows excessive growth of algae, sedimentation following deforestation; over harvesting of fish, clams, and other animals and finally, blasting with dynamite and releasing cyanide to collect the few remaining living creatures
- ❖ Extensive loss of coral reefs is expected within the next 40 years in tropical East Asia, the area around Madagascar and East Africa and throughout the Caribbean
- ❖ In the Caribbean, a combination of over fishing, hurricane damage, pollution and disease is responsible for a dramatic decline of a large proportion of the coral reefs and their replacement by fleshy macro algae





Coral Reefs



- ❖ Elkhorn and Staghorn corals, which were formerly common in the Caribbean and have become rare in many locations
- ❖ The corals found in the temperate zone of the North Atlantic, these are rich in numerous species new to science, they are being destroyed by trawlers, which drag nets across the sea floor to catch fish, the trawlers are destroying the very coral reefs
- ❖ Coastal development, and estuaries, bogs and swamps converted to land fills, dumps and residential areas



Coral Reefs



- ❖ Another contributing factor is urbanization means coastal lands converted into shopping centers, housing development brings related problems like green house gases, toxic waste, garbage and sewage
- ❖ Habitat loss or change in habitat for corals can result from excess shade, increased levels of ultraviolet radiation, sedimentation pollution, salinity changes and increased temperatures



Coral Reefs

Dredging ship channels:

- ❖ According to National Marine Fisheries service 90 fish species found off shores of US have been depleted include bluefin tuna, cod, flounder, swordfish, blue marlin, Atlantic lobster, red snapper, salmon and number of sharks.



Coral Reefs

Biological diversity due to loss of habitat in United States

<u>Threatened species group</u>	<u>% of loss</u>
---------------------------------	------------------

- | | |
|-------------------------------------|----|
| • All species (1880 species) | 85 |
| • All vertebrates (494 species) | 92 |
| • Mammals (85 species) | 89 |
| • Birds (98 species) | 90 |
| • Amphibians (60 species) | 87 |
| • Fishes (213 species) | 97 |
| • All invertebrate (331 species) | 87 |
| • Fresh water mussels (102 species) | 97 |





DEGRADATION



Even when a habitat is unaffected by over destruction or fragmentation, the species in that habitat can be affected by human activities.

Frequent boating and diving among coral reefs degrade the community, as fragile species are crushed by divers, flippers, boat hulls and anchors.

The trawling destroys the anemones and sponges and reduces species diversity, biomass and community structure.

The most universal form of environmental degradation is pollution, commonly caused by pesticides, sewage, fertilizers from agricultural fields, industrial chemicals and wastes, emissions from factories and automobiles and sediment deposits from eroded hill sides.



DEGRADATION

Pesticide Pollution

- DDT – Dichloro Diphenyl Trichloroethane
- DDE – Dichloro Diphenyl Dichloro Ethane
- Dieldrin
- PCBs – Poly Chlorofluoro Benzene
- CFC – Chloro Fleuro Carbon
- Birds such as the Osprey (*Pandion haliaetus*) and the bald eagle (*Haliaeetus leucocephalus*)



DEGRADATION

Water Pollution



■ By-pesticides, herbicides, oil products, heavy metals (mercury, lead & zinc), detergents and industrial wastes directly kill the organisms in the aquatic environment. 90% of the endangered fishes & freshwater mussels in the United States due to pollution.

■ Eutrophication - Bloom

Ex: In Gulf of Mexico, the Mediterranean sea, the north sea and the Baltic sea in Europe, seas of Japan.



DEGRADATION



Sedimentation:

- Eroding sediments from farmed hill sides- sediment covers the submerged plant leaves
- Increasing water turbidity-Prevent animal species from seeing, feeding & living in the water
- Sediment loads are harmful to coral species that require crystal-clear waters to survive.



DEGRADATION

Air Pollution:



■ Cement factories

■ Acid rain-wastes from coal & oil refineries released nitrogen & sulfur oxides combine with moisture produce nitric & sulfuric acid lower the pH & reduce the productivity in oceans.

■ Acid rain is severe problem in eastern North America, China, Korea, with in next 50 years acid rain will also affect, western coastal India & South Central Africa

■ In US only 40 million metric tones of compounds are released each year

■ Increased acidity may fish fail to spawn, reduced the amphibian species-more acidity increase the eggs mortality and young animals.

DEGRADATION

Ozone production & Nitrogen deposition:

- Automobiles, Power plants & industrial activities & release hydrocarbons & nitrogen oxides.

Toxic metals: Mining & smelting operations

Marine debris: Synthetic materials, plastics found in stomach of when animals that ingest debris that blocked the digestive track. 26 species of Cetacean died due to debris.

HAB's: produce potent toxins (Biotoxins)-cause mortalities of marine mammals, sea turtles, fish and shellfish.

- Eg: In 1987 humpback whale *Megaptera novaeangliae* died.



DEGRADATION

Oil Pollution:

- Seals & sea lions

- Birds

- In 1989, Exxon Valdez spill in Alaska, kill more marine mammals & birds.

- Bottle nose dolphins, beluga whales, manatees, polar bears threatened to industrial pollution.



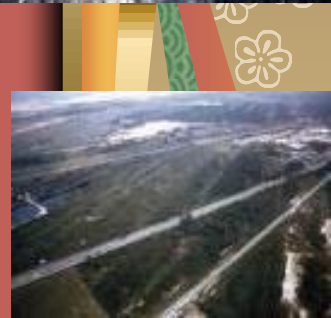
HABITAT FRAGMENTATION

Fragmentation means that area loss occurs along with the splitting up of habitat into many isolated pieces

Fragmentation is due to overfishing-when trawlers scrap the seafloor over and over again, leaving only rubble areas with mud and agriculture, rural development, urbanization.

Previously continuous habitat split into many smaller areas and there is a loss of total area of that habitat

Ex. Philippines, some 80% of the coral reefs areas have been affected by dynamite fishing, trawling and other disturbance



HABITAT FRAGMENTATION

Problems due to fragmentation:

- Reduction in the total area of the habitat
- Increase in the amount of edge
- Decrease in the amount of interior habitat
- Breaking up of one patch of habitat into several smaller patches
- Decrease in the average size of each patch of habitat



HABITAT FRAGMENTATION

Other problems:

- Because of fragments, competition for food
- Competition for habitat (space)
- Facing DO problems
- Problem in fish migration

