ZOO504 - Wildlife

1; Introduction

"Wildlife" refers to neither cultivated or domesticated nor tamed organisms.

Or

Organisms that grow or live wild in an area without being intervened by humans.

Wild life is natural renewable resource with a great importance throughout world.

It comprises innumerous varieties of living organism in their natural habitats.

- Wild Plants
- Wild Animals
- Fungi
- Microorganisms

Wildlife can be found in all ecosystems.

- Deserts
- Forests
- Rain forests
- Plains
- Grasslands

Habitat determines any wildlife species found in any area. The amount and distribution of food, water, cover, and space will influence the type and survival of wildlife in that area. Some wild species require special habitat features for their existence.

Snags:

- Dead or partially dead standing trees. Nesting sites for forest-dwelling bats/birds.

Cavity Trees:

- Holes excavated in snags by woodpeckers. Shelter and nesting cover by many species.

Rocky Outcrops and Caves:

- Rattlesnakes use small cave like openings in outcrops as hibernacula.

Wet Lands:

- Migratory birds

PPT 2: Importance - Significance

Wildlife is an integral part of an ecosystem.

- Human himself as animal inter-related and inter-dependent on wildlife for its survival.
- From clothes to medicines, building materials to variety of chemicals all are extracted from exiting wildlife around us.
- About 90% of the domestic food crops now cultivated are descendants of wild plants.

- Today, variety of plant products like lumber, paper, rubber, oils, dyes, and fibers etc. are supplied by wild plants.
- Plants recycle nutrients necessary for agricultural production and help maintain soil fertility.
- Wild plants or their extracts are a source of medicine for an estimated 80% of the world's population.
- Source of oxygen.
- Insects and birds add to the economic gains through pollination of plants.
- Maintaining the 'balance of Nature'. e.g. Carnivore-herbivore balance.

PPT 3: Gene Bank

Gene banks are the bio-repositories used for the preservation of genetic material.

❖ **Wildlife can be served as a source of Gene Bank.**

Agriculture

- Many wild relatives of crops, plants and presence of useful seeds are screened out and selected.
- Such selection can then be introduced to breeding programs.

Animal Husbandry

- Wild species' genotype may have a gene particularly resistant to parasites or to a particular disease.
- Such genes are of great value, especially if incorporated into local livestock to create hardier and even more productive animals.
- Blood samples of the wild animals can be screened which would be helpful for identifying and resolving causes of disease epidemics.

PPT 4: Plant Propagation

❖ **Wild animals can be helpful to plant propagation in various ways**

- **Pollination**------ (Honeybees, hummingbirds, and some bats. etc.) Pollen stick to bee's body and legs which then transferred to flower it visits.
- **Dispersal of seeds**------ (squirrels, birds, rodents etc.) Seeds can stick to fur . Squirrels or birds pick them up and drop or bury them. Seed eaters also disperse the seeds by defecation . Caching behavior of many rodents and some birds.
- **Conifer trees (pine, spruce, fur, etc.) use their pinecones** - there are seeds in there that can be eaten or distributed by mice and other animals.

Hence if the animals get extinct or moved due to environmental conditions, the plants will not propagate effectively.

PPT 5: Ecological Balance

❖ **Scavengers (Vultures, eagles, jackals, hyaenas etc.) & decomposers serves to perform important tasks.**

- ❖ Nutrients recycling
- ❖ Humus formation
- ❖ Cleaning of environment

- ❖ Soil erosion can be prevented by wild plant cover.
- ❖ Mixing of litter by movement of wild animals.

PPT 6: Economic Importance

From the economic point of view wildlife is important and serves as source of

- **Tourism**

Fascination with the beauty of wild animals drives tourism worldwide. e.g. Safari park in Lahore Pakistan. Kruger National Park in South Africa.

- **Animal Protein**

e.g. In some forested area in Latin America, wildlife acts as animal protein source.

- **Bushmeat** (Wild meat)

Wild meat tends to have less fat than domestic meat and can be a good source of iron, Vitamin A and Vitamin B.

- **Trading of Bushmeat**

In sub-Saharan Africa there is a long tradition of trade between rural areas and the major towns, where it is sold as a high-priced delicacy.

- **Ranching and Farming**

Commercial ranching and farming of wild animal occurring in countries like China, Zimbabwe & Thailand.

- **Traditional medicine/ Pharmaceutics**

  e.g. *Nerium oleander* (Anvirzel)

- **Wood**

  Wildlife resources like wood from trees are used for making houses.

  - Silk
  - Paper
  - Leather/Hide
  - Ivory

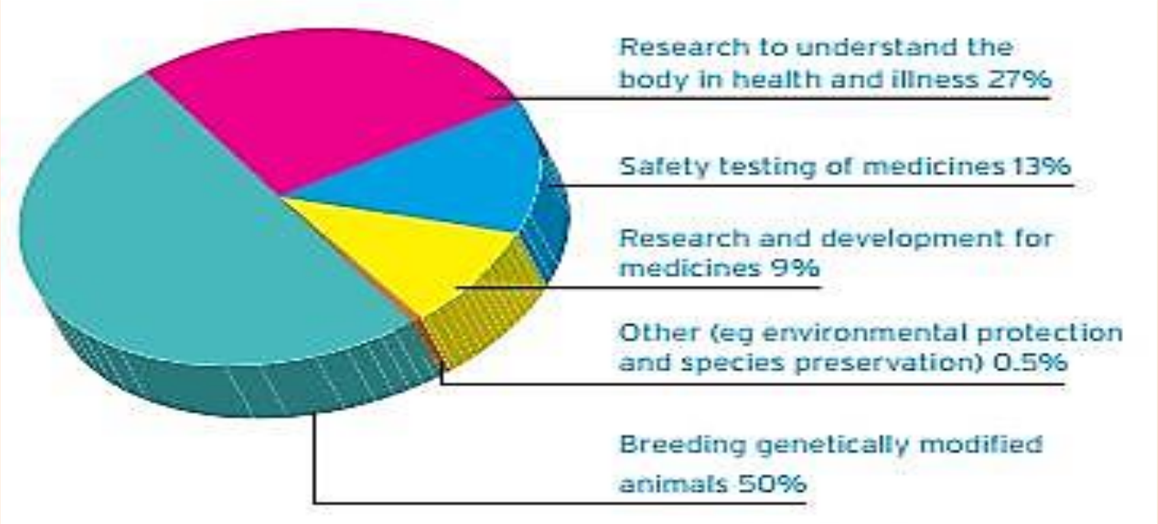
PPT-7: Scientific Importance

1. **Wild animals as Experimental Animals -**
   - Monkeys, Rabbits, Guinea-pigs, Rats etc.
2. **Recovery/Cure of diseases**-
   - **Leukaemia**

     Rosy periwinkle leaves extract as anticancer
   - **Ebola**

     Ebola vaccine (VSV-EBOV) found 100% safe Initially tested in primates,

3. Wildlife provides a means of developing models for disorders of behavior and cognition.
4. This has led to identify phenotypic markers of mental distress.
5. Wildlife is also applicable for the studies of anatomy, physiology, ecology and evolutionary aspects.



Topic8 to 11: Terminologies

Prior to the discussion about wildlife it is useful to learn some important terms that will recur in the course.

Terminologies-I

- **Biodiversity:** Variability among living organisms from all sources
- Carnivore
- Ecosystem
- **Endangered species**: e.g. Asian Elephant, Bengal Tiger etc.


- **Endemic species:** e.g. Galapagos fauna
- **Exotic species**
- **Extinct species**: e.g. Woolly Mammoth
- **Feral:** Organism that has changed from being domesticated to being wild, natural, or untamed. e.g. Goats, Cats etc.

Terminologies II

Some recurring terms in the Wildlife course.

- **Game Reserve:** An area where regulated hunting & shooting is allowed.
- **Habitat:** Natural home of the an organism.
- **Home Range:** where an animal lives and moves on a periodic basis

- **I.U.C.N:** International Union for Conservation of Natural Resources.
- **National Park:** Public recreational area where flora and fauna are in their natural state.
- **Population**
- **Predator**
- **Prey**

Terminologies III

Some important terms in the Wildlife course.

- Protected Area
- Ramsar site
- Red Data Book
- Safari Park
- Sanctuary
- Territory
- Wetland
- W.W.F

Terminologies IV

Important terms to understand in the Wildlife course.

- W.W.F.P.
- Zoo/Zoological Garden
- Zoological Museum
- Zoological Park
- Zoonosis
- Ex-situ conservation
- In-situ conservation

12: Aesthetic & Recreational Value

It is the pleasure to enjoy the beauty of wildlife

- People enjoy seeing plants and animals in their natural habitats for recreation.
- They are a source of joy, wonder, and pleasure for many people.
- Wildlife tourism (ecotourism).
- Bird watching, is now a growing part of wildlife tourism.
- Animals photographed for recreational purposes also have aesthetic value.
- Exotic game ranches
- Viewing non-native species in a “near-native” habitat.
- Visiting Safari parks/zoo as recreational activity
- Visiting hilly areas for recreational purpose

13: Commercial Value

Wild life is natural renewable resource hence has a great economic value throughout world.

Trading

- Trading of wildlife and its products. e.g. Bush meat, Ivory, hide, trophy, fur etc.

Tourism

- Fascination with the beauty of wild animals drives tourism worldwide.

Farming

- Commercial farming occurring in countries like China, Zimbabwe & Thailand for economic gains.

14: Game Value

Wild life has immense values to hunt for sports

- Industrial Revenue—manufacturing of items for fishing, hunting etc.
- Government revenue– issuance of licenses, leases.
- Houbara bustard as game bird
- Markhor hunting for trophy
- Situations of wild life animals is alarming due to extensive gaming.
- In Punjab-Pakistan hunting is not allowed after 1974 wild life act and Amendments in 1991
- Hence fishing be the only sports.

15: Cultural Value

Wild life is a natural gift with cultural importance.

- Religions have often declared certain animals and their products to be sacred.
- Spiritually significant
    - Eagles, hawks and their feathers have great cultural and spiritual value to Native Americans as religious objects.
    - In Hinduism the cow is regarded sacred.
- Markhor is a national animal of Pakistan

16: Ecological Value

Wildlife play a very integral role in maintaining the fragile balance that ensures the wellness of the earth.

- Each species functions with a specific role – predator, prey, decomposer etc. and hence ecological balance is maintained.
- Certain wild animals and bird are natural Scavengers such as kites, Vultures, eagles, jackals, hyaenas etc.)
- These help to maintain hygienic conditions by

1. Nutrients recycling
2. Humus formation
3. Cleaning of environment

17: Scientific Value

Wildlife is applicable for the fundamental studies like anatomy, physiology, ecology and evolutionary aspects.

- Medicinal value of Wild flora and fauna
    - *Nerium oleander* (Anvirzel ™)
    - Cincona (Quinine

- Musk deer (Musk pod)– multiple effects particularly enhances myocardial function.
- Wild animals as Experimental Animals -
    - Monkeys, Rabbits, Guinea-pigs, Rats etc.

2. Negative Values of Wildlife

18: Predation:

Negative impact of wildlife occurs when growing human populations overlap with established wildlife territory. People lose their crops, livestock, property, and sometimes their lives

- Baboons in South Africa attacking young cattle.
- One-horned rhinos in Nepal destroying crops.
- Bears and wolves killing livestock.
- Wolf attacks sheep, and reindeers in Sweden.

The impacts of predation are huge. In Russian Far East farmers raise captive deer for human consumption. Deer are the natural prey preference for leopards, and in absence of wild prey, leopards venture into the deer farms in search of food.

19: Carrier of Diseases

Wild animals serves as a reservoir for many diseases (Zoonosis).

These diseases are

1. **BACTERIAL:**

- **Bubonic plague**

Host: Fleas; often found on rats and ground squirrel

Transmission: Flea bite.

- **Tularemia** (rabbit fever)

Host: Rodents and rabbits. fox, beaver, mice, and muskrats and some species of birds.

Transmission: Handling infected animals, contamination of cuts, mosquito/fly/ tick bites, and by inhalation.

2. **Viral Diseases**

The usual mode of viral transmission and dissemination is through the direct contact or aerosol contact with others of their own species.

- **Rabies**(Hydrophobia) : Bite Wound Disease

Host: Any mammal, usually carnivores; highest incidence is in skunks, foxes, bats, and raccoons.

Transmission: Bite wounds, infected saliva in cuts or skin abrasions, aerosol in bat caves.

3. Other causative agents of zoonotic diseases
- Mycotic
- Helminth parasitic
- Protozoal

20: Destruction of Property

Elephants frequently raid and destroy crops. Elephants eat up to 450kg of food per day. They are messy eaters, uprooting and scattering as much as is eaten. Losses due to elephant damage regarding plantations and timber are estimated to be around US$105 million per year. Bears are sometimes known to attack livestock and water pipes, raid orchards, and occasionally on storehouses of food.

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Topic: Causes of Wildlife Depletion

21: Persecution of Human

Conflict between wildlife and human occur over

- Living space
- Food

These factors are the main threats to the continued survival of many species in different parts of the world.

The main factors of Persecution are:

Wildlife Trade

Trading of wildlife and its products. e.g. Bush meat, Ivory, hide, trophy, fur etc.

Trapping of Wild Animals

- Pets(cats etc.)
- Sold for Medical experimental studies (Monkeys, Rabbits etc.)
- For street shows, circuses (Bears,Parrots,Lions)

Poaching

- Illegal killing for tusks, oil, decoration (as stuffed preparation), Plumage.
- Illegal hunting for bush meat, trophies.

Absurd killing

- Tigers, jackals, wolves etc. are killed by the farmers.

22: Loss of Habitat

Habitat loss poses the greatest threat to species. Habitat destruction is identified as a main threat to 85% of all species described in the IUCN's Red List. The world's forests, swamps, plains, lakes, and other habitats continue to disappear as they are harvested for human consumption.

Forest Loss and Degradation

Expansion of agricultural land, intensive harvesting of timber, wood for fuel etc. is the cause of forest loss. Palm oil plantations in the tropical regions of Africa, Latin America, and Asia have led the large scale destruction of important habitat for many species (Orangutans, tigers, elephants, rhinos). In Malaysia and Indonesia where large tracts of rainforest are cleared to grow palm oil crops. It is an estimate that almost 70% of deforested areas are converted to agricultural land.

Coastal and Marine Areas

Population growth, urbanization, and industrialization results in marine and coastal degradation. Poverty, consumption and land-use patterns contribute to the degradation of marine habitats and to the destruction of the species that rely on them to survive.

Drainage of Wetlands

Wetlands are being drained for cultivation and building of roads etc.

23: Pollution

Pollution of various kinds have adversely affected wild animals.

- **Insecticides**

  There has been a considerable damage to birds by insecticides spraying.

- **Oil Spillage**

  Oceanic birds are killed by oil spillage from oil tankers in the sea.

- **Noise Pollution**

  It causes disturbance of hormonal and reproductive behavior of many wild animals.

- **Water Pollution**

  Domestic as well as industrial waste dumped into water bodies causes decline in stocks of fishes.

- Animals like mussels have been unfit for human consumption
- Various natural calamities like floods, hurricane, fire etc. have also caused massive destruction of wildlife.

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Topic: Modes Of Wildlife Conservation

24: Study & Improvement Of Habitat

Habitat determines any wildlife species found in any area.

Wildlife can be found in all ecosystems.

- Deserts
- Forests
- Rain forests
- Plains
- Grasslands

Type and survival of wildlife in any area depends upon following features of habitat.

- Food
- Water
- Cover
- Space

Some wild species require special habitat features for their existence.

Snags:

- Dead or partially dead standing trees. Nesting sites for forest-dwelling bats/birds.

Cavity Trees:

- Holes excavated in snags by woodpeckers. Shelter and nesting cover by many species.

Habitat loss poses the greatest threat to species. Effective steps should be taken for the improvement and development of habitat.

Things should be banned in nearby area.

- Urbanization
- Industrialization

25: Preservation Of Habitat

Wildlife habitats are not stable.

Changes occurring in habitats is mainly due to

- Biotic succession
- Natural calamities
- Human intervention
- Pollution

These changes alter food, cover and other habitat resources for all wildlife species.

Conservation strategies like *ex-situ* & *in-situ* can be applied for well being of wildlife and their habitat.

- National Parks
- Sanctuaries
- Reserve Forests etc.

Networks of such protected areas cover most of the representative habitat.

Phenomena like

- Excessive cutting of trees
- Uprooting of plants
- Grazing of livestock
- Pollution

Must be checked in the protected areas to preserve the habitat.

26: Wildlife Census

For implementation of various protective laws an accurate idea about population density of species is essential.

- Censuses require a lot of work, but these efforts serve an important purpose.

Census is mandatory to count numbers and distribution of wildlife populations.

- Proper planning
- Implementation
- Evaluation of conservation programs
- African elephant, which are under escalated threat from poaching, habitat loss and human–wildlife conflict.
- An aerial census conducted in the border between Kenya and Tanzania.

Census can be helpful in mapping factors of

- Animals roaming
- Water sources
- Human activities, such as livestock grazing and charcoal burning.

27: Wildlife Legislation

To protect wildlife and nature from depletion and destruction, strict laws should be enforced.

- Various countries of the world have formed various laws to forbid killing of wildlife.

Laws and rules lays down regulations for declaration of

- Issue of ownership certificates.
- Issue of licences for conducting trade.
- Penal measures for violation.
- Punishment to poachers etc.

Stringent punishments have been provided against infringement of provisions of these rules.

Some common rules/Acts are.

- The Cutting of Trees (Prohibition) Act, 1992.
- The Wild Birds and Animals Protection Act, 1912.
- The Pakistan Plant Quarantine Act, 1976
- The Pakistan Animal Quarantine (Import and Export of Animals and Animal Products) Ordinance, 1979
- The Pakistan Animal Quarantine (Import and Export of Animals and Animal Products) Rules, 1980.
- Madras Wild Elephant Preservation Act, 1873.
- All India Elephant Preservation Act, 1879.
- Wild Birds and Animals Preservation Act, 1912.
- Bengal Rhinoceros Preservation Act, 1932

28: Wildlife Education

Generally people are ignorant about the utility of wildlife.

Thus, certain measures for mass education should be undertaken.

- At the formal level, schools, colleges and universities should include in the curriculum, the study of ecology, wildlife and conservation.
- The creation of awareness and right attitude towards wildlife and their conservation.
- Active involvement of Mass media such as newspapers and magazines, radio and television.
- Awareness among public about National parks and sanctuaries, zoological parks and natural history museums.
- Cinematography on wildlife and the necessity for conservation should be screened even to the remotest villages and to all classes of students, so that they develop love and affection towards wildlife.

29: Veterinary Service

Veterinarians are concerned with health of free-ranging wildlife populations and deals with the health of diverse range of species. Veterinarians make important contributions to zoos, wildlife conservation, and ecosystems.

Major Challenges to Veterinarians

- Environmental contaminants
- Infectious diseases
- Outbreaks that potentially threaten wild and domesticated animals as well as humans.

Wildlife veterinarians are necessary and should made available to care of wild animals.

Veterinarians are to prevent

- Infectious disease transfer at the domestic animal-wildlife interface.
- Movement of diseases between wildlife and domestic species.
- Reducing contact between domestic and wild animals where necessary.

30:Wildlife Awareness

Most people of any country are ignorant about the utility of wildlife. Hence, for the conservation of wildlife there is a great need of educating people.

To achieve this goal following methods can be adapted.

- Celebration of wild life week every year.
- Publicity through media and film shows.
- Holding conducted tours, essay competitions, lectures, seminars, etc.
- Setting up nature clubs in educational institutions.
- Publication of wildlife books and journals.
- Establishment of natural history museums etc.

31: Establishment Of Protected Areas

Protected Area

" *A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values"*.

Protected areas are one of the most effective tools for conserving species and natural habitats.

- National Parks
- Sanctuaries

Particular species of animal which is rare is given importance for conservation in a protected area.

- In Pakistan, Lal Suhanra at Bahawalpur conserves Black buck.
- In India, Gir Forest at Gujarat, conserves lions.
- W. Bengal conserve one-horned rhinoceros etc.

32: Role of International Agencies

For the conservation of threatened and endangered species and ecosystems, it is a need an hour to involve international agencies.

The agencies provide finical and technical assistance.

- W.W.F.: World Wildlife Fund.
- I.U.C.N.: International Union for Conservation of Natural Resources.
- C.I.T.E.S.: Convention on International Trade in Endangered Species.

Small Grants Programme (SGP)

- *"Small support for long term impact".*

SGP of WWF-Pakistan has been supporting grass root level organizations and researchers to strengthen efforts to conserve threatened and endangered species and ecosystem. Under the programme more than 450 projects have been successfully completed.

SGP has supported innovative conservation initiatives for priority species and ecosystem.

- Marine turtles
- Snow leopard
- Indus River dolphin
- Sharks
- Mangroves forests
- Indus river delta
- Coniferous forests.

Collaborative research programs should be initiated with neighboring countries with common ecosystem.

PPT-33 Wildlife Agencies

Significant Organizations

For the conservation of threatened and endangered species and ecosystems, it is a need an hour to involve international agencies.

The agencies provide finical and technical assistance.

Wildlife Conservation Society (WSC) (1895):

500 projects in more than 60 nations around the world that are intended to help protect both wildlife and the wild places in which they live. Gorillas, tigers and ocean giants.

PAWS-CHICAGO

Provides healthcare and rehabilitation to wild animals.

Pakistan Animal Welfare Society (PAWS)

Aims to create an equitable relationship between humans and animals in Pakistan.

Gorilla Doctors (1980s):

Dian Fossey- Founder : Team of veterinarians that cares for mountain gorillas of Rwanda, Uganda and National Republic of Congo

Wildlife Alliance(1994):

Protection to forests and wildlife in the Southeast Asian tropical belt.

International Fund For Animal Welfare (IFAW) (1969):

“Rescue and protect animals around the world”

Saving seals, whales, elephants and tigers are significant projects of IFAW.

W.W.F (1961):

To stop the degradation of the planet’s natural environment and to build a future in which humans live in harmony with nature.

World Society for the Protection of Animals:

Promote treatment of animals and good animal welfare. Whales, bears and orangutans are included

African Wildlife Foundation(1961):

To ensure the wildlife and wild lands of Africa will endure forever.

Animal Welfare Institute (1951):

Eliminate the impact of human actions detrimental to endangered species.

34: World Wide Fund for Nature (W.W.F.)

World's largest voluntary organization: Setup in 1961.

Headquarter: Its headquarter is at Gland, Switzerland.

Symbol: Giant Panda is the official symbol of W.W.F.

History:

Previously, it was known as World Wildlife Fund (W.W.F). In 1990, it was renamed as Worldwide Fund for nature.

WWF revised its mission statement to:

"Stop the degradation of the planet's natural environment and to build a future in which humans live in harmony

Mission can be accomplished by:

- Conserving the world's biological diversity
- Ensuring that the use of renewable natural resources is sustainable;
- Promoting the reduction of pollution and wasteful consumption.
- Organization raises funds for urgent conservation requirements.
- Promoting conservation through the worldwide education campaign and public consciousness.

Committee:

An executive committee comprising

- President
- Ten members of the Board of Trustee of W.W.F.

Responsible to the Board for the administration of the fund. Board can also include influential individuals from a wide variety of professions such as science, finance, art, advertising, trade and diplomates to utilize their talents.

Collaboration:

W.W.F. works in collaboration with:

- IUCN
- UNO
- UNESCO
- UNEP
- FAO

35: International Union for Conservation of Nature and Natural Resources (I.U.C.N)

History:

IUCN was founded in 1948. It is leading international, non-government organization concerned with conservation. Network of governmental and non-governmental organization.

Members:

IUCN has more than: 475 member organizations. 116 government agencies in 133 countries.

Functions:

Monitoring the status of conservation. Developing plans for dealing with problems such as the World Conservation strategy. Promoting action on their plans by government or

organizations. Coordinating communication between the members and the commissions as well as the development. Providing advice and assistance to complement conservation measures. Selection and management of WWF projects. Managing the UNEP and C.I.T.E.S secretariat. Performing the continuing duties under conservation of wetlands of international importance, specially by waterfowl habitats.

36: Species Survival Commission (SSC)

The SSC is one of the commission of IUCN, the World Conservation Union.

Mandate of the Commission :

The Commission shall conduct its activities in accordance with its mandate as established by the World Conservation Congress.

Aim:

"To conserve biological diversity by developing and executing programmes of study, save, restore and manage wisely the species and their habitats".

Vision:

The work of SSC is guided by the Vision of:

"A just world that values and conserves nature through positive action to reduce the loss of diversity of life on earth"

Goal:

The overriding Goal of the Commission is:

"The species extinction crisis and massive loss of biodiversity are universally adopted as a shared responsibility and addressed by all sectors of society taking positive conservation action and avoiding negative impacts worldwide".

Objectives:

- Assessing and monitoring biodiversity.
- Analyzing the threats to biodiversity.
- Facilitating and undertaking conservation action.
- Convening expertise for biodiversity conservation.

37: Species Survival Commission (SSC)

Achievements to date:

- The IUCN Red List
- Species Conservation Strategies
- Policies and Guidelines
- Supporting the implementation of environmental friendly rules

Current initiatives:

- Interdisciplinary action
- The use of The IUCN Red List
- Increasing the taxonomic coverage of the SSC

Challenges for the future:

- Response of species to climate change
- Area-based conservation planning
- Rapid decline of large animals in Asia

- Save Our Species (SOS)

Facts and Figures:

- The SSC is governed by a Steering Committee, which is headed by the Commission Chair.
- SSC done its work by Specialist Groups, Red List Authorities and Task Forces.
- Bird groups
- Freshwater Fish Specialist Group
- These groups are governed in a joint collaboration between the SSC and Wetlands International.
- There are currently 112 Specialist Groups.
- The number of SSC members is constantly changing.
- At the end of 2011 it stood at around 8,000.
- Individual members are invited to join by the Chair of each group.

38-39: Convention on International Trade in Endangered Species (C.I.T.E.S)

History:

CITES came into force in 1975, and became the only global treaty to ensure that international trade in plants and animals does not threaten their survival in the wild. Currently 180 countries, including the United States, implement CITES.

- A Secretariat, in Geneva, Switzerland.
- Permanent committees
- Non-governmental organizations.

Conference of the Parties meets every 3 years to review CITES implementation and assess the status of species in trade. Cacti, iguanas, and parrots represent some of the approximately 35,000 species protected by CITES. Species protected under CITES are listed in one of three appendices:

Appendix I

Species threatened with extinction and provides the greatest level of protection, including restrictions on commercial trade. Examples include gorillas, sea turtles, most lady slipper orchids, and giant pandas.

Appendix II

Species that, although currently not threatened with extinction, may become so without trade controls. **Examples** include American ginseng, paddlefish, lions, American alligators, mahogany, and many corals.

Appendix III

Species for which a range country has asked other parties to help in controlling international trade. **Examples** include map turtles, walrus and Cape stag beetles.

Monitoring trade

The backbone of CITES is the permit system that facilitates international cooperation in conservation and trade monitoring. Permits are issued only if a country's Management and Scientific Authorities determine that trade is legal and does not threaten the species' survival in the wild. These permit allows inspection at ports of export and import to quickly verify that CITES specimens are properly documented. This trade monitoring has created an information on the management and use of CITES species worldwide. CITES has helped global

conservation of species. CITES provides tools to effectively conserve the world's diverse natural resources. It control global over-exploitation of wildlife.

40: Indus River Dolphin Conservation Project (IRDCP)

Introduction:

Indus River Dolphin *(Platanista gangetica minor)*, an endangered species endemic to the Indus River system in Pakistan. This project was developed to conserve a viable population

Habitat: Habitat has been reduced to one fifth of its historical range and further degraded due to shortage of water.

Population: Divided in sub-populations because of the six barrages constructed on the River Indus.

Project Area: Covering an area of 200 km between Guddu and Sukkur barrages in the province of Sindh and some extensions of the project covers the Punjab.

Project Objectives:

- Protecting the innate biodiversity of the Lower Indus River Basin Eco-system.
- Ensuring the sustainable use of riverine biodiversity.
- Promoting actions to mitigate pollution and the wasteful extraction of riverine resources.

Project Sponsors:

- WWF-Switzerland
- Swedish International Development Agency (SIDA)
- Engro-foods Limited, Pakistan.

Stakeholders:

- WWF-Pakistan
- Sindh Wildlife Department (SWD)
- Agriculture Extension Department, Sindh (AED)
- Sindh Environmental Protection Agency (SEPA)
- Sindh Fisheries Department (SFD)

Project Approach:

The Indus River Dolphin Conservation Project focuses on the root causes of biodiversity loss by linking the protection of the Indus River Dolphin with measures in the agricultural and fisheries sectors.

41: International Whaling Commission (I.W.C)

Set up in 1946 as an international agreement to regulate whaling and to provide for conservation of whale stocks. The Commission has a membership of 88 Contracting Governments.

I.W.C is mandated, to cooperate with other intergovernmental organizations including:

- International Maritime Organization (IMO)
- Regional Marine Fisheries Organizations (RFMOs)
- Marine Council
- UNEP

Collaborations:

Collaboration with other international organizations on some issues include:

- Climate change
- Marine debris
- Marine safety
- Habitat degradation
- Marine Protected Areas
- Marine Science

Headquarters:

The headquarters of the I.W.C is in Impington, near Cambridge, England. The Commission has three main committees:

- Scientific
- Technical
- Finance and Administration

Purpose:

The purpose of the I.W.C as specified in its constitution is

"Safeguarding for future generations the great natural resources represented by the whale stocks;"

Original members consisted only of the 15 whale-hunting nations.

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Topic: Regional Wildlife Rules In Pakistan

42: Significant Wildlife Acts/Laws

Significant Acts to protect and preserve wildlife are as under:

- Cattle-Trespass Act, 1871
- Prevention of Cruelty to Animals Act, 1890
- Animals Slaughters Control Act, 1963
- Balochistan Sea Fisheries (Amendment) Act, 1994
- Balochistan Sea Fisheries Ordinance, 2001
- Balochistan Sea Fisheries (Amendment) Act, 2009
- Balochistan Animal Slaughter Control (Amendment) Act, 2010
- Balochistan Goats (Restriction) (Amendment) Act, 2010
- Karachi Cattle Slaughter Control Act, 1950
- Convention On The Conservation Of Migratory Species Of Wild Animals, 1979
- Punjab Goats (Restriction) Ordinance, 1959
- Punjab Fisheries Ordinance, 1961
- Punjab Animals Slaughter Control Act,1963
- Punjab Livestock, Dairy and Poultry Development Board Act, 1974
- Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974
- Punjab Livestock Associations and Livestock Associations Unions (Registration and Control) Ordinance, 1979
- Punjab Animals Compound Feed and Feed Stuff Ordinance, 2002
- Sindh Wildlife Protection, Ordinance,1972
- Sindh Fisheries (Amendment) Act,2003
- Sindh Fisheries (Amendment) Act, 2011
- Sindh Wildlife Protection (Amendment) Act, 2008
- West Pakistan Goats (Restriction) Ordinance, 1959
- West Pakistan Goats (Restriction) (Sind Repeal) Act, 1972

- West Pakistan Goats Restrictions Rules, 1961
- Azad Jammu and Kashmir, Wildlife (Protection, Preservation, Conservation and Management) Ordinance, 2011
- Azad Jammu and Kashmir, Wildlife (Protection, Preservation, Conservation and Management) Act, 2014

(43-47) Act-Ordinance

Features of the Wildlife Act

Features common in all Provincial Acts or Ordinances of Pakistan are discussed here, taking Punjab Act as an example:

Short Title

- This Act may be called the Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974.

Definitions

- Board" means the Punjab Wildlife Management Board constituted under section
- "Exotic" means wildlife species not native to Pakistan
- Section" means a section of this Act
- Prescribed" means prescribed by rules

Appointment of Officers

- Government may determine the number and class of officers including honorary officers to be appointed under this Act.

Powers of an Honorary Officer

- Honorary officer appointed under section 3 shall have such powers of an officer as may be prescribed.
- The officer shall hold office for a period of three years unless the appointment is revoked earlier.

Constitution of Board

The Board shall consist of

- Chairman
- Vice-Chairman
- Number of members as may be appointed by Government.
- Chief Minister of the Punjab shall be the chief warden and *ex-officio* Chairman of the Board.
- Minister incharge of the Department shall be the *ex-officio* Vice Chairman of the Board.
- Secretary to Government, Forestry, Wildlife, Fisheries and Tourism Department shall be the *ex-officio* Secretary of the Board.

Funds

- The board shall maintain books of account and shall get it audited.
- The Board shall take necessary steps for rectification of an audit objection.

Restrictions on hunting

No person shall

- Hunt any protected animal.
- Hunt any game animal except under a permit.

Prohibition of Employ Hawks and Dogs for Game Animals without Special License

Animals found dead killed or caught unlawfully

- Any meat or trophy thereof shall be the property of Government.

Certificate of Lawful Possession

- No person shall be in possession of any wild animal unless he be in possession of a certificate of lawful possession.

Restrictions on Import and Export of Animals, Trophies or Meat

No person shall

- Receive by gift, purchase or otherwise any animal of a kind specified in the Second Schedule
- Unless a valid certificate of lawful possession in respect thereof.
- Restrictions on Dealing in Animals, Trophies and Meat
- Wildlife Sanctuary
- National Park
- Game Reserve

Penalties

- Imprisonment which may extend to a period of one year or with the fine.

Killing or Capturing in Self Defense

Any person kills any wild animal in self defense or that of any other person's life

Onus of Proof

- When in any proceedings taken under this Act.
- Wild animal, trophy or meat shall be presumed to be the property of until the contrary is proved.

Power to Search Without Warrant

- Provided that no premises shall be searched under this section except under the authority of a warrant issued by the magistrate having jurisdiction in the area.

Power to Seizure

- Any officer authorized by Government in this behalf, may seize any wild animal, dead or alive anything whatsoever used or suspected to have been used in the commission of an offence under this Act.
- Duty to produce permit on demand made by any officer or person authorized in this behalf.
- Duty of coupe purchaser, chowkidar, village watchman

Procedure when offender not known or cannot be found

- When the offender is not known or cannot be found any officer authorized in this behalf may, if he finds that an offence has been committed, confiscate the property used in the commission of the offence.

Power to Arrest

- Any officer authorised, without orders from a magistrate and without a warrant, arrest any person against whom a reasonable suspicion exists of his having been concerned in any offence under this Act.

Power to release on bond of a person arrested

- Any officer not below the rank of the Game Inspector or of an equivalent rank may release such person on his executing a bond to appear.

Power to prevent commission of offence

Persons who may lodge complaints

- Cognizance of any offence under this Act shall not be taken by any court except on the complaint of the officer.

Power to Seizure

- Any officer authorized by Government in this behalf, may seize any wild animal, dead or alive anything whatsoever used or suspected to have been used in the commission of an offence under this Act.

Court which is competent to take cognizance of offences

- No court inferior to that of a Magistrate of the First Class shall take cognizance.

Power to try offences summarily

Power to compound offence

- Government may, by notification in the official Gazette, empower an officer to accept from any person against whom reasonable suspicion exists that he has committed any offence under this Act, a sum of money by way of compensation for such offence.

Prosecution of offences under any other law

- Nothing contained in this Act shall be deemed to prevent any person from being prosecuted under any other law.

Government may invest officer with certain powers

- Of Civil court to compel the attendance of witnesses and the production of documents and material objects;
- To hold an inquiry into offences
- To prosecute a case before a magistrate.
- Officers, etc. to be public servants
- Protection of action taken under this Act
- Duty of Police Officer
- Delegation of Powers

Power of Sale or Exchange

Power to make Rules

Power to add to or exclude from Schedules

- Government may, for scientific management, public purpose exercise the above mentioned powers.

Power to grant exemption

- Government may, in the interest of any scientific or public purpose, allow, by notification in the official Gazette, hunting and capturing of such wild animals in any specified place by any specific means.

Dissolution of the Board

- Government may, by notification in the official Gazette, declare that the Board shall be dissolved on such date and with such consequences as may be specified in the notification.

Schedules

Along with the ordinance, four schedules have been issued which are referred as

- First
- Second
- Third
- Fourth

Schedule I:

- Wild animals that can be hunted on an ordinary permit, with the details of everything is mentioned.

Schedule II:

- Animals, trophies or meat for the possession, transfer or export of which certificate of lawful possession is required.

Schedule III:

- Wild birds and animals protected throughout the year.

Schedule IV:

Wild birds and animals which are not protected

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Topic: IUCN Categories of Protected Areas

48: Concept of Protected Areas

Protected area is

" *A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values"*.

Protected areas are one of the most effective tools for conserving species and natural habitats. IUCN classify protected areas according to their management objectives.

The categories are

- Recognized by international bodies, United Nations and many national governments.
- Considered be the global standard for defining and recording protected areas.
- Increasingly being incorporated into government legislation.

IUCN Protected Areas Categories System

1. Category I
   - Category Ia
   - (Strict Nature Reserve)
   - Category Ib (Wilderness Area)
2. Category II (National Park)
3. Category III (Natural Monument or Feature)
4. Category IV (Habitat/Species Management Area)
5. Category V (Protected Landscape/\Seascape)
6. Category VI (Protected area with sustainable use of natural resources

49: Category Ia: Strict Nature Reserve

Definition:

Protected areas that are strictly set aside to protect biodiversity where human visitation, use and impacts are strictly controlled to ensure protection of the conservation values**.**

Primary objective

To conserve

- Regionally
- Nationally
- Globally outstanding ecosystems

- Species (occurrences or aggregations)
- Geo diversity features

Other Objectives

- To preserve ecosystems.
- To secure examples of the natural environment for scientific studies.
- To minimize disturbance through careful planning.
- To conserve cultural and spiritual values associated with nature.

Distinguishing features

The area should generally:

- Have a largely complete set of expected native species.
- Be capable of being managed to ensure minimal disturbance.
- Be free of significant direct intervention by modern humans.
- Have a full set of expected native ecosystems, largely intact with intact ecological processes, or processes capable of being restored with minimal management intervention.
- Be managed for relatively low visitation by humans.

Role in the landscape/seascape

- Protecting some of the earth's richness that will not survive outside.
- Protecting additional ecosystem services.
- Providing areas where ecosystems can be studied in as pristine an environment as possible.
- Protecting natural sites that are also of religious and cultural significance.

Issues for consideration

- There are few areas not under some kind of legal or at least traditional ownership, so that finding places that exclude human activity is often problematic.
- Most apparent problem is with climate and air pollution
- New and emerging diseases.
- In an increasingly modified ecology, it may become increasingly difficult to maintain pristine areas through non-intervention.

50: Category Ib: Wilderness Area

Definition:

Protected areas that are usually large unmodified or slightly modified areas, retaining their natural character and influence, without permanent or significant human habitation.

Primary Objective

- To protect the long-term ecological integrity of natural areas that are undisturbed by significant human activity.

Other Objectives

- To enable indigenous communities to maintain their traditional wilderness-based lifestyle.
- To protect the relevant cultural and spiritual values and non-material benefits to indigenous or non-indigenous populations.

Role in the landscape/seascape

- Protecting compatible ecosystem services
- Protecting large mainly untouched areas where ecosystem processes
- Providing space for a limited number of visitors to experience wilderness

Distinguishing features

- Be free of modern infrastructure, and industrial extractive activity.
- Be free of inappropriate or excessive human use or presence.
- Containing a large percentage of the original extent of the ecosystem

Issues for Consideration

Some wilderness areas include livestock grazing by nomadic peoples and distinctions may need to be made between intensive and non-intensive grazing; however this will pose challenges if people want to increase stocking density.

51: Category II: National Park

Definition:

Large natural or near natural areas set aside to protect large-scale ecological processes, which also provide a foundation for environmentally scientific, educational, recreational and visitor opportunities.

Primary objective

To protect natural biodiversity along with its underlying ecological structure.

Other objectives

- To manage the area in order to perpetuate, in as natural a state as possible.
- To maintain viable and ecologically functional populations.
- To contribute to local economies through tourism.
- To manage visitor use for inspirational, educational recreational purposes.

Distinguishing features

- The area should contain representative examples of major natural regions, and biological and environmental features or scenery.
- It should be of sufficient size to maintain ecological processes.
- The composition, structure and function of biodiversity should be to a great degree in a “natural” state.

Role in the landscape/seascape

- Protecting larger-scale ecological processes.
- Protecting compatible ecosystem services.
- Protecting particular species and communities that require relatively large areas of undisturbed habitat.
- To inform and excite visitors about the need for and potential of conservation programmes.
- To support compatible economic development, mostly through recreation and tourism, that can contribute to local and national economies and in particular to local communities.

Issues for consideration

Commercialization of land and water in category II is creating challenges in many parts of the world.

52: Category III: National Monument-Feature

Definition:

- Protected areas set aside to protect a specific natural monument.
- They are generally quite small protected areas and often have high visitor value.

Primary objective

- To protect specific outstanding natural features
- Their associated biodiversity and habitats

Other objectives

- To provide biodiversity protection in landscapes or seascapes that have otherwise undergone major changes
- To conserve traditional spiritual and cultural values of the site.

Distinguishing features

Category III protected areas are usually relatively small sites that focus on one or more prominent natural features and the associated ecology, rather than on a broader ecosystem.

Natural geological and geomorphological features:

Waterfalls, cliffs, craters, caves etc**.**

Culturally-influenced natural features:

Cave dwellings

Natural-cultural sites:

Forms of sacred natural sites (sacred groves, springs, waterfalls, mountains, sea coves etc.) of importance to one or more faith groups

Cultural sites with associated ecology:

Where protection of a cultural site also protects significant and important biodiversity, such as archaeological or historical sites that are inseparably linked to a natural area.

Role in the landscape/seascape

An opportunity for environmental, cultural, education

53: Category IV (Habitat/Species Management Area)

Definition:

Protected areas aiming to protect particular species or habitats and management reflects this priority.

Primary objective

To maintain, conserve and restore species and habitats.

Other objectives

- To protect vegetation patterns.
- To protect fragments of habitats as components of landscape or seascape-scale conservation strategies.
- To develop public education and appreciation of the species or habitat

Distinguishing features

- Protection of particular species
- Protection of habitats
- Active management to maintain target species
- Active management of culturally-defined ecosystems

Role in the landscape/seascape

- Protect critically endangered populations of species.
- Protect rare or threatened habitats.
- Maintain species that have become dependent on cultural landscapes where their original habitats have disappeared or been altered.

54: Category V (Protected Landscape/\Seascape)

Definition:

- A protected area where the interaction of people and nature over time has produced an area of distinct character with significant ecological, biological, cultural and scenic value.
- Where safeguarding the integrity of this interaction is vital to protect and sustain the area and its associated nature conservation and other values.

Primary objective

To protect and sustain important landscapes/seascaps and the associated nature conservation.

Other objectives

- To maintain a balanced interaction of nature and culture through the protection of landscape and/or seascape
- To provide opportunities for enjoyment.
- To provide natural products and environmental services.

Distinguishing features

Landscape or coastal and island seascape of high or distinct scenic quality and with significant associated habitats.

Opportunities for recreation and tourism consistent with life style and economic activities

Role in the landscape/seascape

- Category V protected areas may also act as linking habitat between several other protected areas.
- To provide a framework when conservation objectives need to be met over a large area.

55: Category VI (Protected area with sustainable use of natural resources

Protected Area with Sustainable Use of Natural Resources

Definition:

Protected areas that conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems.

Generally large, with most of the area in a natural condition. Where a proportion is under sustainable natural resource management. Where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.

Primary objective

- To protect natural ecosystems
- Use natural resources sustainably, when conservation and sustainable use can be mutually beneficial.

Other objectives

- To promote sustainable use of natural resources.
- To promote social and economic benefits to local communities.
- To facilitate scientific research and environmental monitoring.
- To facilitate recreation and appropriate small-scale tourism.

Distinguishing features

- It is not designed to accommodate large-scale industrial harvest.
- Achieve nature conservation.
- Category VI protected areas aim to conserve ecosystems and habitats

Role in the landscape/seascape

- Protected areas are particularly adapted to the application of landscape approaches.
- It is particularly appropriate to the conservation of natural ecosystems when there are few or no areas without use or occupation.

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Topic: National Parks

56: National Parks

IUCN classify protected areas according to their management objectives.

Accordingly, there are six categories. National Parks belongs to “Category II”

IUCN Definition:

> Large natural or near natural areas (at least 1000 hectares) set aside to protect large-scale ecological processes, which also provide a foundation for environmentally scientific, educational, recreational and visitor opportunities.

Concept:

- National Park is an area of outstanding scenic merit and natural beauty where the landscape, flora and fauna are protected and preserved in a natural state.
- Public access for recreation, education and research is provided.
- Access roads and other facilities should be planned so they do not conflict with main objectives of National Parks.

Acts prohibited under Law in National Parks:

- Firing of guns
- Hunting, killing, trapping or capturing wild animals inside or within a radius of three miles of its boundaries.
- Interfering with animals and plants
- Clearing land for cultivation.
- Flow of polluted water is also prohibited.

Under the regulations, these acts may be allowed for scientific purposes or for the improvement of the park.

57: General Rules

The Ministry of Interior is the responsible authority for National Parks. The Ministry may establish a National Planning Commission to designate, alter or abolish areas for National Parks. The Commission may review National Park management plans.

National Parks are meant for

- Preserving the nation's unique natural scenery
- Protection of wild fauna and flora
- Preserving historic sites
- Providing public recreation
- Areas for scientific research.
- Areas having unique landscapes, significant ecological systems, or habitats
- Biodiversity that are representative of the natural heritage of the nation.
- Administrative headquarters shall be established at each National Park.

In accordance with the existing land use and the characteristics of the resources, a National Park may be divided into the following zones for management:

- Existing use area
- Recreation area
- Cultural/historic area
- Scenic area
- Ecological protected area

The following activities shall be prohibited within the National Parks:

- Burning of vegetation or setting fires to clear land.
- Hunting animals or catching fish.
- Polluting water or air
- Picking or removing flower or any other vegetation.
- Engraving, sketching or defacing trees, bark, stone or signs.

Within cultural/historic areas, the following activities shall be subject to prior permission from the Ministry of Interior:

- Repairing artifacts or historic monument.
- Repairing or reconstructing buildings.
- Making artificial alterations to original landscapes or landforms.

58: List of National Parks in Pakistan

Pakistan has 29 Protected Areas known as National Parks. As of 2012, 22 of these are under supervision of respective Provincial Governments and remaining are in private care.

Only some of these are under the conservation scope of IUCN.

1. Ayub Park
   Rawalpindi
2. Shandure-Phander National Park
   Ghizer
3. Broghil Valley
   Chitral
4. Central Karakoram
   Gilgit and Skardu
5. Chinji
   Chakwal
6. Chitral Gol
   Chitral

7. Deosai
   Skardu
8. Deva Vatala
   Bhimber
9. Ghamot
   Neelum
10. Musk Deer NP Gurez
    Neelum
11. Hazarganji-Chiltan
    Quetta
12. Hingol
    Awaran, Gwadar and Lasbela
13. K2
    Gilgit, Skardu
14. Kala Chitta
    Attock
15. Khunjerab
    Gilgit
16. Kirthar
    Dadu
17. Lal Suhanra
    Bahawalpur
18. Margalla Hills
    Islamabad, Rawalpindi
19. Murree-Kotli Sattian-Kahuta
    Rawalpindi
20. Pir Lasura
    Kotli
21. Poonch River Mahaseer
    Kotli, Mirpur and
    Poonch
22. Qurumber
    Ghizer
23. Saiful Muluk
    Mansehra
24. Sheikh Buddin
    Dera Ismail Khan
25. Toli Pir
    Poonch
26. Panjal Mastan
    Bagh District
27. Machiara
    Muzaffarabad

59 KIRTHAR NATIONAL PARK

Location

The **Kirthar National Park** is situated in the Kirthar Mountains in Karachi and Jamshoro District in Sindh, Pakistan. South –Western part of Sindh.

Establishment

- It was founded in 1970 and stretches over 3,087 square kilometres.
- Second largest National Park in Pakistan after Hingol National Park.
- Hub lake with 82 square km

Major Fauna

26 principal species of mammals are believed to occur in the park.

- Indian leopards
- Striped hyenas
- Indian wolves
- Urials
- Chinkara gazelles
- Sind wild goats(Rarely)

Birds fauna is equally rich with at least 58 varieties.

- Kingfisher
- Larks
- Eagles
- Vultures

This park is primarily established to protect and preserve wild goats and sheep of Sindh.

- 1971-1200
- 1977-2500
- Todate-4000

Blackbuck antelopes are kept in enclosures for a reintroduction project at Kirthar National Park. The park is accessible by four wheel drive vehicles Two rest houses belonging to the Sindh Wildlife Department are available for tourist accommodation.

60: Lal Suhanra National Park

Location:

Bahawalpur district of Punjab. One of the largest Nationals Parks in South Asia. It is also a UNESCO declared Biosphere Reserve.

Area:-

Lal Suhanra is spread over 31,368 hectares Notable for the diversity of its landscape, which includes areas of desert, forest and wetland.

Features:

- This park is primarily established to protect and preserve Black buck and chinkara.
- Todate-150, Nilgai, Indian rhino have also been introduced there. .
-

Many species of animals can be found throughout the park. These include several wild animals of the desert such as

- Wildcats
- Rabbits bustards
- Deer

Reptiles in the park include the

- Monitor lizard,
- Russell's viper etc

More than 160 varieties of birds are also present, including:

- Houbara bustard
- Griffon vulture

- Crested honey buzzard
- Marsh harrier
- Hen harrier
- Laggar falcon
- Peregrine falcon
- Kestrel

61: Chinji National Park

. Chinji National Park was established in 1987. It is located close to Salt Range, about 130 km from Islamabad in the south.

Location:

Talagang Tehsil, Chakwal District, Punjab, Pakistan

Area

Chinji National Park covers a total area of 6,095 hectares (15,061 acres).

Features:

- Deeply eroded land of Chinji consists of sandstone to igneous rocks, combined with small deposits of rock salt from the Salt Range.
- The area has an elevation imperial of 2,231 feet (680 m).
- Deep torrential streams and ravines slope into the Soan River, which passes through the area.
- The Park exhibits the biome of deserts and xeric shrub lands and falls in the ecoregion of 'Baluchistan xeric woodlands
- The area is characterized to have sub-tropical vegetation with many plant species of importance.

Major Fauna

The area is mainly meant for the protection of threatened species of Urial.

Chinji National Park is also a natural habitat of

- Chinkara
- Gazelle
- Wild boar
- Civet
- Wild hare
- Mongoose
- Porcupine

62: Hazarganji Chiltan National Park

Hazarganji Chiltan National Park was established in 1978. Mergence of Hazarganji State Forest and Chiltan State Forest.

Location: Mastung District of western Balochistan, Pakistan.

Area: It covers 325,000 acre of land located close to the Koh-i-Chiltan mountain in Quetta's outskirt.

Features: The park is in the Sulaiman Mountains, with deseriand forest habitats.

Major Flora:

- Pashtun Juniper
- Pistachio
- Almond
- Ash trees

- Wild figs

Major Fauna:

The area is mainly meant for the restoration of endangered species of Chiltan Markhor

- To date about 300- 400 Sulaiman Markhor and around 800 Chiltan ibex survive within the park boundaries.
- The Suleiman Markhor is also present in the northern part of the Chiltan Range and a few urial still survive on the western slopes between 1,500m and 2,100m

Mammals other than Markhor in the park includes

- Indian wolf
- Stripped hyena
- Leopard
- Caracal
- Jackal
- Red fox
- Porcupine
- Desert hare

Birds in the Park are

- Houbara bustard
- Griffon vulture
- Egyptian vulture
- Honey buzzard
- Laggar falcon
- Peregrine falcon
- Kestrel
- Indian sparrow hawk
- Scops owl
- Common cuckoo
- European nightjar
- Long-billed pipit
- Orphean warbler
- Variety of wheatears
- Rock partridge
- Chukor

63: Ayubia National Park

Ayubia National Park was declared a National Park in 1984. Ayubia was named after Muhammad Ayub Khan, the then President of Pakistan.

Location:

Abbottabad District, Khyber Pakhtunkhwa- Pakistan.

Area:

Initial area was 1684 ha, expanded through northern extension in 1998. Total area 3,312 hectares (8,184 acres)

Features:

- This Natiopnal park is surrounded by three small towns(Nathia gali, Ayubia and Khanaspur)
- Rainfall: 1,244 cm
- Temperature: 3 °C - 11 °C

The Area Supports

- Temperate coniferous forest
- Temperate broadleaf and mixed forest

- These forests have an average elevation of 8,000 feet (2,400 m) above the sea level.

Major Flora:

The park holds 104 species of plants. The main floral species are

- *Cedrus deodara*
- Blue pine
- Yew
- Silver fir
- Horse chestnut
- Oak

Plants belonging to 19 families are known for their medicinal properties.

Major Birds Fauna:

- The park harbors up to 203 species of birds.
- Golden eagle
- Vulture
- Eurasian sparrow
- Hawk
- Hill pigeon
- Khalij Pheasant (30 species)
- Spotted dove
- Collared dove

Major Mammal Fauna:

Ayubia National Park supports 31 species of mammals.

- Asiatic leopard
- Hill fox
- flying squirrel
- Masked civet
- Rhesus Macaque

64: Khunjerab National Park

Khunjerab National Park was established on 29 April 1979.

Location:

- Gilgit Baltistan-Pakistan.
- Adjacent to the Taxkorgan Natural Reserve in China.

Area:

Spreads over 2,26,913 ha

Features:

- One of the highest National Parks in the world.
- It is Pakistan's third largest National Park.

Area of Park lies at an elevation of 4000m

Important Fact:

- The borders of the Park mapped in 1974, after a field survey to protect “Marcopolo Sheep”.
- The population of that sheep was around 400 but had dropped to below 180 by the time of the completion of the Karakoram Highway.

Major Fauna

The primary purpose of this park was to provide protection to the endangered **Marco Polo sheep**, which is only found in this area in Pakistan.

Snow leopards

- Worldwide---7,000-10,000
- Khunjerab Park---More than 300

Other Mammalian Fauna

- Himalayan ibex
- Himalayan brown bear
- Red fox
- Tibetan wolf
- Blue sheep
- Western kiang (Wild ass)
- Mountain weasel
- Beech marten
- Long-tailed marmot
- Eurasian lynx
- Large-eared pika
- Cape hare
- Wood mouse
- Royle's mountain vole
- Asian house shrew
- Etruscan shrew
- Grey dwarf hamster

Birds Fauna

- Golden Eagle
- Black vulture
- Marsh Harrier
- Eurasian Sparrow Hawk
- Himalayan Snow Cock
- Snow Partridge
- Grey Heron
- Snow Pigeon

Important Fact:

According to WWF officials there is plan to turn “Khunjreb National Park” into “International Peace Park”. To conserve area on both sides of the boarder.

65: Margalla Hills National Park

Location:

North of the Islamabad City, Capital of Pakistan.

Area

- 12,000 ha

Features:

- Elevation range 550m to 1500m.
- Rugged topography
- Numerous valleys
- Precipitous slopes
- Margalla hills have beautiful torrents gushing down in the monsoon.
- Natural springs are also present.
- The Park includes the Margalla Hills which form's the foothills of the Himalayas, along with Shakarparian Park and Rawal Lake.

The park is rich in biodiversity

- 600 plant species
- 250 bird varieties
- 38 mammals
- 13 species reptiles.

Richness of species

- Sino-himalayan fauna
- Gray goral
- Barking deer
- Leopard

Major Flora:

In southern slopes

Deciduous and evergreen trees with diverse shrub growth.

In the north

- Pines
- Oak

Major Fauna:

The fauna is mainly Indo Himalayan, with some overlapping of Palearctic species

Birds Fauna:

The birds found here are residents as well as winter migrants from higher altitudes of the north, spring and summer visitor for breeding.

- Larks
- Paradise flycatcher,
- Black partridge
- Shrikes pheasants
- Spotted doves
- Egyptian vulture
- Falcons
- Hawks
- Eagles

Mammalian Fauna:

- Margalla has a variety of mammals
- Indian leopard
- Gray goral
- Barking deer
- Wild boar
- Golden jackal
- Red fox
- Porcupine

Reptilian Fauna:

Margalla has a variety of reptiles

- Russell's viper
- Indian cobra
- Saw-scaled viper

66: Chitral Gol National Park

Chitral Gol National Park is established in 1984. “Gol” is local langauge meaning “Valley”.

Location:

Hindukush range. Beside the Chitral River in Chitral District - Khyber Pakhtunkhwa-Pakistan.

Area:

7,780 ha

Features:

- Rainfall is estimated to be 462 ml.
- Weather is cold and dry.
- The temperature ranges from -12.2 to 43.3 °C.

Major Flora:

- The park is rich in a particular tree. Cedar

Major Fauna:

- Chitral National Park provide shelter to a vast biodiversity, especially Markhor.
- Holds the largest population of the Astor Markhor in the world.
- Siberian ibex
- Ladakh Urial
- Asian black bear
- Snow leopard (Non-permanent resident)
- Tibetan wolf
- Red fox
- Yellow-throated marten
- Himalayan otter

Birds Fauna:

- Bearded vulture
- Himalayan vulture
- Golden Eagle
- Demoiselle crane
- Peregrine falcon
- Himalayan snow cock
- Himalayan monal
- Snow partridge
- Rock partridge
-

67: Hingol National Park

Hingol National Park was established in 1988. It is now named as Dharune-Hingol National Park, formed by the mergence of two Parks.

Area:

165,700ha.

Location:

It is located along the Makran coast in southwestern, Balochistan-Pakistan. It lies within three districts of Balochistan, Lasbela, Gwadar and Awaran.

Major Fauna:

The Park is rich in fauna and is known to support

- 35 species of mammals
- 65 species of amphibians and reptiles
- 185 species of birds

Animals provided protection in this National Park

- Wild Sindh ibex
- Baluchistan urial
- Chinkara gazelle

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Topic: **Wildlife Sanctuaries**

68: Concept of Wildlife Sanctuaries

Definition:

Wildlife Sanctuary, is a protected area, provides an undisturbed breeding ground for the protection of wildlife. It is a naturally occurring sanctuary, may be an island.

It provides protection for species from

- Hunting
- Predation
- Competition

These wildlife refuges are generally officially designated territories. Such refuges can protect animals that are endangered.

Importance:

- National parks, wildlife sanctuaries and other protected spaces, help to conserve the natural world and benefit us in many ways.
- A wildlife sanctuary is promoting conservation, and thus play an important role in society.

Purpose:

Animal sanctuaries exist for many specific reasons:

- Help to protect animals and safeguard their lives.
- Animal sanctuaries give new homes to abandoned animals.
- Animals rescued from dangerous conditions.
- Help to protect animals from illegal activities.
- Serve as places where endangered animals breed and are therefore protected.

PPT-69 General Rules

In the **Wildlife Sanctuary** public access is prohibited.

The following acts are also prohibited and one must abide by certain rules and regulation.

Rules:

- Entry or residence
- Land cultivation
- Damaging or destructing vegetation
- Exploration of forest is not permissible except for reducing
  - Fire hazards
  - Epidemics

- Insect attacks
- Natural calamities
  - No person shall hunt, kill or capture any animal.
  - No person shall be found in circumstances that it is his intent on to hunt, kill or capture any animal in a Wildlife Sanctuary.
  - Introduction of any exotic species
  - Causing any fire
  - Polluting the water flowing in the Sanctuary

PPT-70 Significant Wildlife Sanctuaries

In Pakistan presently there are 99 Wildlife Sanctuaries. IUCN recognized number of Wildlife Sanctuaries in Pakistan.

Northern Area

- Astore
- Baltistan
- Naltar

Baluchistan

- Borraka
- Buzi Makola
- Ziarat Juniper
- Chorani

Khyber PakhtunKhwa(KPK)

- Manglot
- Argam Basti

Punjab

- Bajwaat
- Chumbi Surla
- Chashma and Taunsa Barrage Dolphin Sanctuary
- Cholistan
- Daphar

Sindh

- Cut Munarki Chach
- Deh Akro
- Dhoung Block
- Bijoro Chach
- Gulsher Dhand
- Hub Dam
- Hadero Lake
- Haleji Lake
- Kot Dinghano
- Mahal Kohistan
- Majiran
- Marho Kotri
- Nara
- Rann of Kutch
- Sadnani

AJK

- Chukor Wildlife Sanctuary

PPT-71 Astore Wildlife Sanctuary

Astore sanctuary was announced on 22 Nov 1975. This sanctuary is contiguous to Baltistan Wildlife Sanctuary

Location:

- Astore District
- Between Nanga Parbat
- Gilgit–Baltistan, Pakistan

Area:

41,440ha

Features:

- Altitude is from 1,212 m to 6,060 m
- Durable and precipitous geography
- Mostly consisting of meta-sedimentary stones
- Several kinds of igneous stones

Primary objective

The sanctuary is home to a small population of the near threatened species, Markhor. Markhor is National animal of Pakistan. It is a large species of wild goats unique to this region of the world

Other fauna

The sanctuary is also conservationist spot for endangered animals.

- Snow Leopard
- Brown Bear
- Lynx.

PPT- 72: Baltistan Wildlife Sanctuary

Baltistan Wildlife Sanctuary was established in 1975

Location:

Skardu District. Between the villages of Rondu and Shengus, in the Skardu District.
Baltistan region of Northern Pakistan

South of the Indus River

Area:

41,500 ha

Important Fact

Baltistan Wildlife Sanctuary is contiguous with the Astore Wildlife Sanctuary to its South and East

Objective:

Purpose of conserving the threatened species

- Snow leopard
- Brown bear
- Lynx
- Tibetan wolf
- Tibetan sand fox
- Markhor
- Bharal
- Siberian ibex.

Avifauna:

Studies indicate that the area is rich in avifauna. 109 birds species have been recorded from the Deosai plateau. This a breeding ground for variety of animals

- Warblers
- Buntings
- Red start

PPT-73: Cholistan Wildlife Sanctuary

Cholistan Wildlife Sanctuary is part of the Cholistan desert

Location:

Cholistan desert. In the South Eastern portion of Punjab

Area:

660,921ha

Mammalian Fauna

Some of the rare animals of this region are:

- Desert Wolf
- Indian Fox
- Red Fox
- Jackal
- Indian Grey Mongoose
- Nilgai
- Antelope
- Caracal Cat
- Chinkara gazelle
- Blackbuck & Small Indian civet

Reptilian Fauna

- Russells viper
- Saw scaled Viper
- Monitor lizard
- Indian Cobra

Birds Fauna

- Saker Falcon
- Black-backed Vulture
- Houbara bustard

PPT-74: Hub Dam Wildlife Sanctuary

Hab Dam Wildlife Sanctuary was declared in July 1974. It is Pakistan's third largest dam

Area:

27,219ha

Location:

It is situated in the north of Karachi bordering the Kirthar National Park Balochistan

Features:

- Hab Dam Wildlife Sanctuary is covering an area of 32 square miles
- Much of the shoreline is steeply shelving and stony
- Many shallow bays
- Small islands

- The greater part of the reservoir (in Balochistan) is unprotected
- The Eastern shore and of the Dam (in Sindh) is protected in the Kirthar National

Fauna:

An ideal place for bird watching

Waterfowl (both resident and migratory). The lake also provide refuge to migratory birds

- Cranes
- Pelicans
- Ducks
- Waders

Fauna:

The surrounding hills are home for

- Urial
- Sindh Wild Goat
- Chinkara Gazelle
- Pangolin
- Wolf
- Jackal
- Common fox
- Numerous reptiles

75: Chashma and Taunsa Barrage Dolphin Sanctuary

Chashma and Taunsa Barrage Dolphin Sanctuary was declared open to the public in 1972

Location:

- Mianwali District, Punjab-Pakistan

Features:

For a wide variety of waterfowls including threatened species, an important site for

- Breeding
- Staging
- Wintering

- Mid-winter waterfowl counts in recent years have regularly exceeded 20,000 birds
- Anatidae (ducks, geese, swans)
- The endangered Indus Dolphin occurs in the river both upstream and downstream of the barrage

Issues for consideration:

- Taunsa Barrage Wildlife Sanctuary is currently confronted with multiple issues
- Limited cultivation is practiced inside the sanctuary area
- Clearing off the natural vegetation
- Alteration of the natural ecosystem
- Degrading wildlife habitat
- Invasion of alien species
- Hence, adverse environmental impacts.

Management Plan:

WWF-Pakistan has developed a sustainable management plan. Indus river dolphin conservation project.

76: Rann of Kutch Wildlife Sanctuary

The Great Rann of Kutch is a salt marsh. Located in the Thar Desert. Kutch District of Gujarat, India and the Sindh, Province of Pakistan. Reputed to be one of the largest salt deserts in the world.

Location:

This Sanctuary, is part of the great “Thar desert”. Sindh-Pakistan

Area:

Spread over 566,375 ha

Features:

- Stabilized heighted sand dunes
- Broad inter-dunal valleys of alluvial soil
- Integral with the large Rann of Kutch across the frontier with India
- Permanent saline marshes
- Coastal brackish lagoons
- Tidal mudflats
- Estuarine habitats
- Scarcity of water remains the potential threat to the ecosystem

Wildlife:

The site supports many locally and globally threatened species.

- Flamingos breeding site(More than 1% of the biogeographical population)
- Indian bustard
- Houbara bustard
- Sarus crane
- Hyena
- 13 species of lark
- Peafowl
- Storks
- Chinkara Gazelle
- Nilgai
- Pangolin
- Desert Wolf
- Desert Cat

- Famous for the Indian Wild Ass sanctuary
- Home of the world's last population of Indian Wild Ass (khur or khar)

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Topic: Game Reserves

PPT-77: Concept of Game Reserve

Definition:

“A game reserve is an area wherein controlled hunting and shooting is permitted on permit basis”

A game reserve (wildlife preserve) is a large area of land where wild animals live safely or are hunted in a controlled way for sport.

- In the game reserves the major focus is specifically the animals.
- If hunting is prohibited, a game reserve may be considered a ”Nature Reserve”
- Wherein all aspects of naturally-occurring life in the area are considered.
- Most of the areas in game reserves have created to provide habitat protection for animal species commonly referred to as game (huntable species for sport or meat)

Game Count:

- Game count to be conducted as it provides an estimation of the game population
- It is to ascertain the number of female animals, as this indicates the production potential.
- Knowing game count statistic informs the farm’s threshold and when, what and how much must be hunted.
- Managing erosion and conserving pasture are also crucial aspects.
- It is an estimate that walking 6km to water isn’t unnatural for an animal.
- Some of the Reserve’s water points will be done away or moved to more suitable locations.

PPT-78: General Rules

To ensure safety in Game reserve, one must adhere to the following rules and regulations and transgression may result in prosecution and or penalties.

Driving Areas

- Vehicles must remain on the designated roads at all times.
- Off-road driving or driving on closed or no-entry roads is a serious offence.

Walking Areas

- Walking trails must be provided throughout the reserve
- One must be adhered to at all times so as to avoid disruption of vegetation and animal communities.

Feeding of Wildlife is Prohibited

- The feeding or intentional disturbance of wildlife is a serious offence.
- By feeding any wildlife we are potentially SIGNING THEIR DEATH WARRANT .
- As animals may become dependent on humans
- Animals may become aggressive and dangerous.

Flora & Fauna

- No plant, animal, wildlife or any natural or cultural items may be removed from the reserve without permission.
- To cut, damage, destroy or be in possession of any plant or part thereof, including dry wood or firewood is a serious offence.

Invasive Species

Importing of any specimen of an alien, invasive species into the reserve is prohibited.

Fire Hazard

Other than with prior consent from reserve management

- Starting or causing of any fire, whether it be intentional or unintentional
- Even in a fireplace or container purposely made available, is strictly prohibited

Smoking

- Smoking may only take place in designated smoking areas
- Cigarette butts must be disposed of in dustbins distributed throughout the reserve.

Vandalism

- Buildings and sites of historical and cultural value exist within the reserve must be treated with respect at all times.
- Vandalism of any buildings or infrastructure is strictly prohibited.

PPT-79: Significant Game Reserves

There are 99 Game reserves in Pakistan

- **Federal territory 1**
- **Balochistan 7**
- **Northern Area 9**
- **Sindh 14**
- **Punjab 19**
- **KPK 38**
- **AJK 11**

Religion wise significant game reserves

IUCN recognized 66 Game/Hunting reserves in Pakistan.

KPK

- Bilyamin
- Goleen Gol
- Gehrait Gol
- Sewagali
- Toshi

Northern Area

- Askor Nullah
- Chassi/Baushdar
- Danyor Nallah
- Nar/Ghoro Nallah
- Kilik/Mintaka

AJK

- Salkhala (Neelum)
- Moji (Leepa)
- Qazinag (Leepa)
- Mori Said Ali (Haweli)
- Phala (Haweli)
- Hillan (Haweli)
- Nar (Bagh)

- Sudhan Gali (Bagh)
- Doom Khalla (Bagh)
- Banjonsa (Poonch)
- Junjhal Hill (Sudhunti)

Sindh

- Ghamot
- Khipro Forest
- Mando Dero
- Mirpur Sakro
- Sukkkur and Gaddu barrage game reserve
- Surjan, Sumbak, Eri and Hothiano
- Tando Mitha Khan

Punjab

- Abbasia
- Bahawalpur Plantation
- Chaupalia
- Cholistan
- Daulana
- Gat Wala
- Head Qadirabad
- Jabbar
- Kala Chitta
- Kot Zabzai
- Ucchali Complex

Baluchistan

- Gogi
- Wam
- Zangi Nawar
- Zawar khan

Federal Territory

- Islamabad

PPT-80: Tooshi Game Reserve

Tooshi, a conservation area for Markhor. It is famous for the polo grounds of

- Shandur
- Broghil National Park
- Mastuj
- Booni
- Bamborat: area where the Kalash cultural festival is held every August of the year.

Location:

Tooshi Game Reserve, is located along the paved road to Garam Chashma in Chitral's Lutkho district.

Area:

It covers 1000 hectares.

Features:

It is proposed to be reclassified as a wildlife sanctuary, with readily viewable Markhor population. The jeep ride is just 20 minutes from Chitral town. The Markhor are best seen along the road at dusk. In the late afternoon until dusk, Markhor can be seen while descending to drink water from the passing river.

PPT-81: Sukkur And Gaddu Barrage Dolphin Reserve

In 1974 the Government of Sindh declared the Indus River between the Sukkur and Guddu Barrages an Indus dolphin Reserve.

Location:

The Indus Dolphin Reserve is a natural wetland and situated in the Sukkar. From the Sukkur Barrage upstream to the Guddu Barrage near Kashmor, Northern Sindh.

Surveys:

From 1972 to 1978 several surveys were conducted between Guddu and Sukkur Barrages

All of these surveys reported estimation of 187 or fewer animals

- A comprehensive assessment of the Indus River Dolphin population was made of their entire range by various agencies
    - WWF Pakistan
    - The Wildlife Departments of Sindh, Punjab and NWFP,
    - The Whale and dolphin Conservation Society, UK
- A minimum abundance estimate of 965 dolphins
- Between Chashma and Taunsa Barrages, 84 dolphins were recorded
- From Taunsa to Guddu Barrages, 259 dolphins
- Highest abundance was the between Guddu and Sukkur Barrages where 602 dolphins were observed.
- A stretch of about 135 km of the Indus River from Sukkur Barrage upstream to Guddu Barrage.
- The Reserve includes the full width of the river when in space and a strip of land three miles wide on either side of the river

PPT-82: Kilik/Mintaka Game Reserve

The name of the game reserve is actually driven from *“The Mintaka Pass or Mingteke Pass or Mintika Pass” and the nearby ”Kilik Pass”*

Mintaka means

“ Thousand goats.

Location

Kilik/Mintaka Game Reserve lies along the border with China. East of the Korakorum highway and the Khunjerab National Park.

Geographical Location:

Lies in Hunza, Gilgit District, on the Pakistan-China boader, 225km from the town of Gilgilt.

Area:

It includes 65,036ha

Features

- The terrain is rugged and mountainous
- There is a variety of rocks
    - Sedimentary
    - Metamorphic
    - Igneous
- Mixture of rock and mineral deposits

Features

- Temperatures at higher elevations remain below freezing point for most of the year
- Winters are severe
- Summers cold and dry.
- Mostly precipitation is in the form of snow

Fauna

Large mammals include

- Marco Polo sheep
- Ibex
- Snow leopard
- Brown bear
- Wolf
- Fox

The avifauna includes a variety of game birds, such as

- Chukar
- Snow partridge
- Raptors
- Vultures

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PPT-83: Ramsar Convention

History

Ramsar is one of the global inter-governmental environmental agreements. The treaty was negotiated in1960s by countries and N. To avoid the increasing loss and degradation of wetland habitat for migratory water birds. In a 18 nations meeting it was adopted in the Iranian city of Ramsar On 2nd February 1971. Came into force in 21st December 1975

Mission

The Convention's mission is

"*the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world"*

The Convention uses a broad definition of wetlands which includes

- All lakes and rivers
- Underground Aquifers
- Swamps and Marshes

- Wet Grasslands
- Peatlands
- Oases
- Estuaries
- Deltas
- Tidal flats
- Mangroves etc.

Concept

- Wetlands are among the most diverse and productive ecosystems.
- They provide essential services and supply all our fresh water.
- Wetlands continue to be degraded and converted to other uses.

The "three pillars" of the convention

The Contracting Parties(160)commit to:

- Work towards the wise use of all their wetlands.
- Designate suitable wetlands for the list of Wetlands of International Importance.
- Cooperate internationally on transboundary wetlands, shared wetland systems and shared species

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Topic: Wetlands and Types

PPT-84: Wetlands and Types

Wetlands are defined according to Ramsar Convention as

"Areas of marsh, fen, peat land or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters".

What are wetlands?

- Wetlands are areas where water is the primary factor controlling the environment and the associated plant and animal life.
- They occur where the water table is at or near the surface of the land, or where the land is covered by shallow water.

Types of Wetlands:

Five major wetland types are generally recognized.

i. Marine
ii. Estuarine
iii. Lacustrine
iv. Riverine
v. Palustrine

Marine

Coastal wetlands including coastal lagoons, rocky shores, and coral reefs.

Estuarine

Including deltas, tidal marshes, and mangrove swamps.

Lacustrine

Wetlands associated with lakes.

Riverine

Wetlands along rivers and streams.

Palustrine

Wetlands that lacks flowing water, “marshy”;marshes, swamps and bogs

PPT-85: Importance of Wetlands

Wetlands are among the world’s most productive environments providing

- Resources
- Enabling recreational activities
- Economic benefits

Source of recreation and tourism opportunities

- Hiking
- Fishing
- Bird watching
- Photography
- Hunting

Flood protection

Acts as natural buffers, soaking up and storing a significant amount of floodwater. A wetland can typically store about three-acre feet of water, or one million gallons. Wetlands are cradles of biological diversity. Providing the water and primary productivity upon which countless species of plants and animals depend for survival. Wetlands are also important storehouses of plant genetic material.

They support high concentrations of

- Invertebrate species.
- Fish
- Amphibians
- Reptiles
- Birds
- Mammals

Source of Food

- Rice, for example, is a common wetland plant, and is a staple diet of more than half of humanity.
- Fisheries (over two thirds of the world’s fish harvest is linked to the health of wetland areas.
- Agriculture, through the maintenance of water tables and nutrient retention in floodplains.

Other Benefits

- Timber and other building materials.
- Energy resources, such as peat and plant matter.
- Wildlife resources.

Source of Herbal medicines

A wide range of herbal medicines are obtained from wetlands

Medicinal leeches, *Hirundo medicinalis* for

- Abscesses
- Painful joints
- Glaucoma
- Venous diseases
- Thrombosis

White willow, *Salix alba*, a riverine plant

- Original source of salicylic acid (SA)
- SA is the precursor of aspirin.
- Used in skin care products.

PPT-86: Criteria for Declaration of "Wetlands" of International Importance

Wetlands should be selected for the Ramsar List on account of their international significance in terms of the Biodiversity

Uniqueness in

- Ecology
- Flora
- Fauna
- Limnology or hydrology

There are nine criteria for identifying Wetlands of International Importance.

Group A

- Sites containing representative, rare or unique wetland types

Criterion 1:

If wetland contains a representative, rare or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region

Group B

Sites of international importance for conserving biological diversity. *Following "Criteria based on species and ecological communities"*

Criterion 2:

A wetland should be considered internationally important if it supports

- Vulnerable
- Endangered or
- Critically endangered species or
- Threatened ecological communities.

Criterion 3:

A wetland should be considered internationally important if it supports

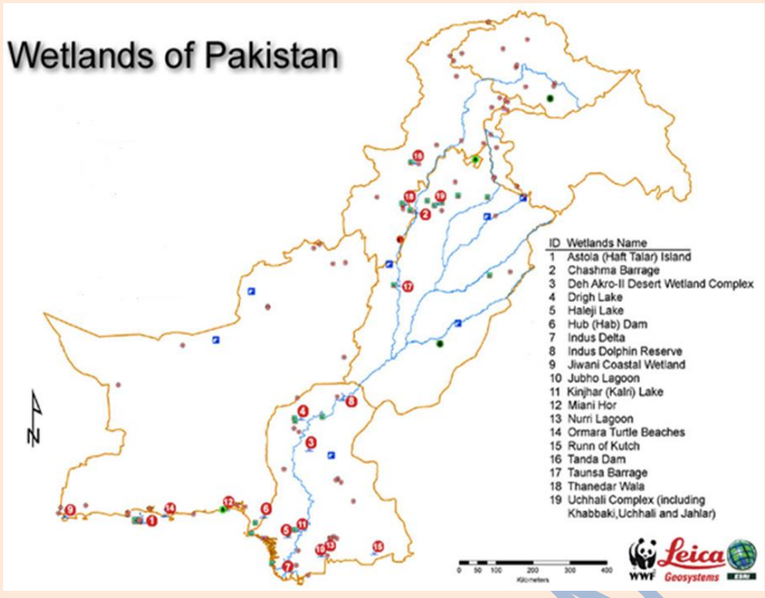
- Populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region

Criterion 4:

A wetland should be considered internationally important if it supports

- Plant and/or animal species at a critical stage in their life cycles or
- Provides refuge during adverse conditions.

Specific criteria based on water birds



Criterion 5:

A wetland should be considered internationally important if

- It regularly supports 20,000 or more water birds.

Criterion 6:

A wetland should be considered internationally important if

- It regularly supports 1% of the individuals in a population of one species or subspecies of water bird.

"Specific criteria based on fish"

Criterion 7:

A wetland should be considered internationally important if

- It supports a significant proportion of indigenous fish subspecies, species or families, life-history stages
- Species interactions.
- And/or Populations that are representative of wetland benefits
- And/or Values and thereby contributes to global biological diversity.

Criterion 8:

A wetland should be considered internationally important if

- It is an important source of food for fishes, spawning ground, nursery
- And/or Migration path on which fish stocks, either within the wetland or elsewhere, depend.

"Specific criteria based on other taxa"

Criterion 9:

It regularly supports 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian species.

PPT-87: Significant Ramsar sites of Pakistan

In 2013, 19 (nineteen) Ramsar sites has been declared in Pakistan.

Area

Covering an area of 1,343,627 hectares (3,320,170 acres)

Religion wise significant game reserves

Baluchistan

- Astola Island
- Hub Dam
- Jiwani Costal Wetland
- Miani Hor
- Ormara Turtle beach

Sindh

- Keenjhar (Kalri) Lake
- Haleji Lake
- Drigh Lake
- Indus Dolphin reserve
- Jubho lagoon
- Nurri Lagoon
- Deh Akro-II
- Indus Delta
- Runn of Kutch

Punjab

- Uchhali Complex
- Taunsa Barrage
- Chashma Barrage

Khyber Pakhtunkhwa

- Tanda Dam
- Thanedar Wala

PPT-88: Threats to Wetlands

Half of the world's wetland have disappeared since long.

- Continued development in all aspects is the need of hour with proper management

Unmanaged activites pose major threats to wetlands, despite their value and importance

Human Activities:

Unfortunately, the increasing population pressure at the beginning of the last century, tightly inter connected with

- Growing need for food resources
- Poor knowledge of ecology of wetlands
    - "Wasted land"
    - Source of diseases

Industrial Development:

The rapid industrial development at the beginning of 19th century led to present-day situation of wetland being affected by human activities.

Major threats to wetlands:

Conversion of wetlands for:

- Commercial development

- Drainage schemes
- Extraction of minerals
- Overfishing
- Pollutants
- Constructions of dams

PPT-89: Industrial Threat to Wetlands

Industrialization and urbanization cause wetland degradation and loss by

- Changing quality & quantity of water
- Flow rates
- Increasing pollutant inputs
    - Sediment
    - Fertilizer
    - Human sewage
    - Animal waste
    - Road salts
    - Pesticides
    - Heavy metals

Hundreds of thousands of hectares of wetlands have been drained for agriculture

- Globally, agriculture accounts for 65% of the total water withdrawal on Earth
- The result is that as the water level drops, millions of trees and plants are dying because they are deprived of their life-sustaining supplies.
- Many small, medium and large modern industries emerged on the banks of the backwaters and rivers.
- They dump their wastes into the waterbed in an attempt to save the costs of pollution abatement
- Agriculture and other industries such as paper making are often very wasteful and inefficient with water.
- Intensive use of agrochemicals has become a major threat for wetlands.
- They causing encroachment, reclamation, pollution, eutrophication, and biodiversity loss.

PPT-90: Invasive Species

Introduction of non-native species is posing a major threat to the wetlands.

An invasive or alien species is established outside of its natural past or present distribution, whose introduction and/or spread threaten biological diversity.

Impact of invasive species

Invasive species have had severe impacts on

- local aquatic flora and fauna
- Can upset the natural balance of an ecosystem.

- An analysis of the IUCN Red List shows that alien species is one of the most common threat associated with species that have gone completely extinct.
- Weeds(lantana, salvinia, caulerpa) and pest animals(pigs) compete with native wetland species and habitats.
- May replace them altogether by affecting water quality and destroy habitats through digging and wallowing.
- An introduced plant lippia and fish European carp displaced native fish in rivers and wetlands

PPT-91: Pollution

Wetland degradation is a big and growing problem occurring due to pollution inputs.

Degraded wetlands are less able to perform their functions effectively. Pollution is the process or act that human did during routine activities and contaminated the environment Harmful chemical substances may cause disturbance in environment health. Although wetlands are capable of absorbing pollutants from the surface water. BUT there is a limit to their capacity to do so.

The primary pollutants causing wetland degradation are

- Sediments
- Fertilizers
- Human sewage
- Animal waste
- Road salts
- Pesticides
- Heavy metals

Pollutants can originate from many sources, including:

- Runoff from urban, agricultural and mining areas.
- Air pollution from cars, factories, and power plants.
- Old landfills and dumps that leak toxic substances.
- Pollution in wetlands is a growing concern, affecting drinking water sources and biological diversity.
- Drainage and run-off from fertilized crops and pesticides used in industry introduce nitrogen and phosphorous nutrients and other toxins like mercury to water sources.
- Pollution in wetlands is a growing concern, affecting drinking water sources and biological diversity.
- Drainage and run-off from fertilized crops and pesticides used in industry introduce nitrogen and phosphorous nutrients and other toxins like mercury to water sources
- These chemicals can affect the health and reproduction of species, posing a serious threat to biological diversity.

PPT-92: Climatic Change

Climate change refers to

"*any change in climate over time, whether due to natural variability or as a result of human activity."*

Climate change is also taking its toll in wetland degradation.

Change in climate poses a fundamental threat to everything we love.

- Rise in temperature
- Melting glaciers
- Rising sea levels
- More frequent weather extremes.

The changes in turn leads to

- Wetlands being swamped
- Some species of mangrove trees being submerged and drowned.

- Other wetlands- estuaries, floodplains, and marshes - are being destroyed through drought.

PPT-93: Vegetation Damage

Wetland plants are susceptible to degradation if subjected to hydrological changes.

Activities that can impair wetland vegetation

- Grazing by domestic animals.
- Introduction of nonnative plants that compete with natives.
- Removal of vegetation for peat mining.

A wetland's characteristics evolve when hydrologic conditions cause

- The water table to saturate or inundate the soil for a certain amount of time each year.
- Any change in hydrology can significantly alter the soil chemistry and plant and animal communities

Common hydrologic alterations in wetland areas include:

- Deposition of fill material for development.
- Drainage for development, farming, and mosquito control.
- Dredging and stream channelization for navigation, development, and flood control.
- Diking and damming to form ponds and lakes.
- Diversion of flow to or from wetlands.
- Addition of impervious surfaces in the watershed, thereby increasing water and pollutant runoff into wetlands.

What we can do?

- Conserve and restore wetlands on your property.
- Reduce the amount of fertilizers, herbicides, and pesticides applied to lawns and gardens.

PPT-94: Construction of Dams

The major problem that affects any ecological system is the increase in population and accompanied changes in land use pattern

- Dams can play an important role in supporting the economic development of a country and its people.
- Once an urgent need for more electricity, irrigation water, or other service has been demonstrated, an options assessment can show whether a large dam is the best alternative.

Dams and Wetlands:

- Worldwide there are now over 40,000 dams which alter the natural flow of water and impact on existing ecosystems.
- Whilst there is much debate about the need for dams to be built
- WWF argues that development should be as sustainable as possible to ensure minimum negative impact on biodiversity.

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Topic: Zoo Rules

PPT 95: Zoo Rules

Zoo is a facility in which animals are

- Housed within enclosures
- Displayed to the public
- They may also breed
- “Today, the zoo is on the list of inevitable field trips and vacation destinations.”

- Zoos have been known for thousands of years, with well-known collections of animals

  i. Egypt
  ii. China
  iii. Rome

The Period of the Kings and Emperors

- King Henry I created the first wild animal menagerie in Britain
- Animal menageries remained private collections until the early part of the 19th century
- After that open to the general public

Public Access

- Public accessibility in Western Europe began at zoological collections in
- Paris
- Vienna
- Dublin
- London lately

Place &Year of starting of Zoos

i.	Vienna zoo	1752
ii.	Paris zoo	1793
iii.	London zoo	1826
iv.	Calcutta zoo	1854
v.	Trivandrum zoo	1857
vi.	Philadelphia zoo	1874

- German collector, Carl Hagenbeck, built the first wild animal park in 1848
- He allowed the animals outdoor access, believing their enclosure should more closely resemble nature
- The Zoological Society of London justified London ’s zoological collection as

“The advancement of zoology and animal physiology and the introduction of new and curios subjects of the Animal Kingdom

final term syllabus 96 to 201

PPT-96: Zoo History

19th and Early 20th Century

- There were only a small number of animal collections
- These consisted of animals from around the world
- Either captured by the Victorian explores
- Presented as gifts from parts of Africa and Asia in return for diplomatic favors

1950s: Zoo Boom

- In the 1950s, there was a 'Zoo Boom'
- At that time entrepreneurs recognized the potential money to be made from exhibiting wild animals to satisfy public curiosity
- Until the 20th century, there was little or no concern for the welfare of zoo animals
- It was not until the late 1970s and early 1980s that the appearance of zoos began to change to reflect the public opinion
- People were then educated about the true conditions endured by zoo animals

Status of Zoos in Today's Society

Zoos exist in today's society for a myriad of reasons including

- Conservation
- Education
- Science
- Recreation

Proponents of animal rights, however, argue that

- Zoos reinforce the notion of human domination over non-human animals, which is never beneficial to animals.
- The existing laws are insufficient to protect the welfare of animals kept in captivity.

PPT-97: Zoo Objectives

Primary Objective:

"Conservation of Wildlife"

- No zoo shall take up any activity that is inconsistent with this objective.
- The objective shall be to complement and strengthen the national efforts in conservation of the rich biodiversity of the country, particularly the fauna."

Visitors are also important factor

- To offer inspiring animal based experiences that connect people with wildlife and conservation plans.
- To offer every visitor a meaningful, and fun learning experience using a variety of innovative approaches.
- To enable Zoo staff and volunteers to actively facilitate the delivery of engaging experiences for visitors.

Strategy for Achieving the Objectives:

- Zoos require a significant amount of resources in the form of
  - Land
  - Water
  - Energy and money
- No new zoo shall be set up unless a sustained supply of these resources and technical support are guaranteed.
- Zoos shall prepare a long-term master plan for development to ensure optimum utilization of the such resources and finance
- Every Zoo shall maintain a healthy, hygienic and natural environment, so that the visitors get opportunity to experience a natural environment.

PPT-98: Categories of Zoo

Based on area, Zoological garden can be categorized into four Zoos

- Large Zoo
- Medium Zoo
- Small Zoo
- Mini Zoo

Areas in hectares of the various categories of zoo

i. Large Zoo (More than 75)
ii. Medium Zoo (50-75)
iii. Small Zoo (20-50)
iv. Mini Zoo (Less than 20)

Number of the Animals exhibited

- Large Zoo (More than 750)
- Medium Zoo (500-750)
- Small Zoo (200-499)
- Mini Zoo (200)

Animal Variety exhibited

- Large Zoo (More than 75 numbers)
- Medium Zoo (50-75 numbers)
- Small Zoo (20-49 numbers)
- Mini Zoo (20 numbers)

Number of Endangered Species Exhibited

- Large Zoo (More than 15)
- Medium Zoo (15-10)
- Small Zoo (9-5)
- Mini Zoo (Less than 5)

Annual Number of Visitors per Year

- Large Zoo (More than 0.75 million)
- Medium Zoo (0.5-0.75 million)
- Small Zoo (0.5-0.2 million)
- Mini Zoo (Less than 0.2 million)

PPT-99: General Guidelines for Administration

General guidelines that zoo administration must follow for its maintenance

- No zoo shall acquire any animal in violation of Wildlife Act.
- No zoo shall exhibit any animal that is seriously sick or injured.
- No zoo shall use any animal, other than the elephant in plains and yak in hilly areas for riding purposes.
- Each zoo shall be closed to visitors at least once a week.
- Each zoo shall have a wall at least two meters high from the ground level.
- No zoo shall have any residential complexes for the staff within the main campus for the zoo.
- Such complexes, if any shall be separated from the main campus of the zoo by boundary wall with a minimum height of two meters from the ground level
- No zoo shall keep any animal chained or tethered unless doing so is essential for its own well being
- The zoo operators shall provide a clean and healthy environment in the zoo by planting trees, creating green belts and providing lawn and flowers bed etc.
- The built up area in any zoo shall not exceed twenty five percent of the total area of the zoo.

- The built up area includes administrative buildings, stores, hospitals, restaurants, visitors rest sheds, animal houses and pucca roads.

PPT-100: Administrative Pattern

General Administrative patterns

- Every zoo shall have one full-time officer in-charge of the zoo.
- The said officer shall be delegated adequate administrative and financial powers as may be necessary for proper upkeep and care of zoo.

Large zoo

At least one full time curator having the sole responsibility of looking after the upkeep of animals and maintenance of the animal enclosures. At least two full-time veterinarians.

Medium zoo

At least one full time curator having the sole responsibility of looking after the upkeep of animals and maintenance of the animal enclosures. At least one full-time veterinarians.

Mini zoo

The mini zoo may at least have arrangement with any outside veterinarian for visiting the zoo everyday to look after the animal.

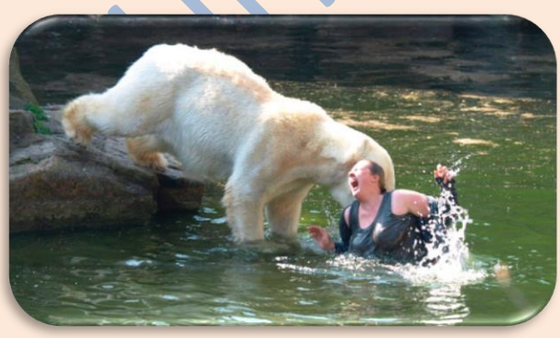
PPT- 101: Animal Enclosure

Essential features regarding animal enclosures are:

- All animal enclosures in zoo shall be so designed as to fully ensure the safety of

  i. Animals
  ii. Caretakers
  iii. Visitors

- Stand of barriers and adequate warning signs shall be provided for keeping the visitors at a safe distance from animals.



- All animal enclosures in a zoo shall be so designed as the meet the full biological requirements of the animals housed therein.
- The enclosures shall be of such size as to ensure that the animals get space for their free movement and exercise.

- **Ensure Minimal Requirement in Captivity**

- Within herds and groups animals are not unduly dominated by individuals
- The zoo operators shall endeavor to stimulate the conditions of the natural habitat of the animal in the enclosure as closely as possible.
- Proper arrangement of drainage of excess of water and arrangements for removal of excreta and residual water from enclosure

- The enclosures housing the endangered mammalian species shall have feeding and retiring cubicle/cell of minimum dimensions.
- Each cubicle/cell/ shall have resting, feeding drinking water and exercising facilities, according to the biological needs of the species.
- The proper ventilation and lighting for the comfort and well being of the animals shall be provided in each cell/ cubicle/enclosure.
- Designing of any new enclosure for the endangered species shall be finalized in consultation with Species Specialists.

PPT-102: Hygiene & Feeding

Maintenance of hygiene is important in every walk of life.

- Every zoo shall have ensure timely supply of wholesome and unadulterated food.
- The food must be in sufficient quantity to each animal according to the requirement of the individual animal, so that no animal remains undernourished.
- Every zoo shall have provide for a proper waste disposal system for treating both the solid and liquid wastes generated in the zoo.
- All leftover food items and animal excreta shall be removed from each enclosure regularly.

- Waste disposal should be done in a congenial manner to general cleanliness of the zoo.
- The zoo operators shall make available round the clock supply of potable water for drinking purposes in each enclosure.
- The periodic application of disinfectants in each enclosure shall be made according to the direction of authorized veterinary officer of zoo.
- For the maintenance of hygienic conditions, each zoo shall have the graveyard where carcasses of dead animals can be buried.
- This would not affecting the hygiene and cleanliness of zoo
- The large and medium zoo shall have an incinerator for disposal of the carcasses and other refuse material

PPT-103: Animal Care, Health & Treatment

The animal shall be handled only by the staff having experience and training in handling the individual animals.

- Every care shall be taken to avoid discomfort, behavioral stress or physical harm to any animal.
- The condition and health of all animals in the zoo shall be checked everyday by the person in-charge of their care.
- If any animal is found sick, injured or unduly stressed the matter shall be reported to the veterinary officer for providing treatment expeditiously.
- Routine examination including parasite checks shall be carried out regularly.
- Preventive medicines including vaccination be administered at such intervals as may be decided by the authorized veterinary officers.
- The zoo operators shall arrange for medical check-ups for the staff responsible for upkeep of animals at least once in every six month.
- This will ensure that they do not have infections of such diseases that can infect the zoo animals.
- Each zoo shall maintain animal history sheets and treatment cards in respect of each animal of endangered species.

PPT-104: Veterinary Facilities

Veterinarians make important contributions to zoos, wildlife conservation, and ecosystems by focusing their efforts on the health of wide range of species.

Every large and medium zoo shall have full-fledged veterinary facilities.

- **Veterinary facilities must include a properly equipped**
  - Veterinary hospital
  - Basic diagnostic facilities
  - Comprehensive range of drugs.
- Each veterinary hospital shall have isolation and quarantine wards for newly arriving animals and sick animals.
- These wards should be located as to minimize the chances of infections spreading to other animals of zoo.

Each veterinary hospital shall have

- Facilities for restraining and handling sick animals including tranquilizing equipment and syringe projector.
- A reference library on animal health care and up keep.

In small and mini zoos, where full-fledged veterinary hospital is not available,

- Shall have at least a treatment room in the premises of the zoo.
- Where routine examination of animals can be undertaken and immediate treatment can provided.

Every zoo shall have a post-mortem room run under an expert veterinarian.

- Any animal that dies in a zoo shall be subjected to a detailed post-mortem.
- The findings recorded and maintained for a period of at least six years.

PPT-105: Breeding of the Animals

Every zoo shall have formulate a program for captive breeding.

- Every zoo shall keep the animals in viable and social groups.

Unless there is a legitimate reason to keep the animal without a mate

- No animal will kept without a mate for period exceeding one year
- If the animal has already passed its prime and is of no use for breeding purposes.
- In the event of zoo failing to find mate for any single animal within this period, the animal shall be shifted to some other place.
- No zoo shall be allowed to acquire a single animal of any variety
- Except when doing so is essential either for finding a mate for single animal housed in the said zoo or for exchange of blood in a captive breeding group.
- Every zoo shall take up regular exchange programs of animals
- This will help to prevent the traits or ill effect of inbreeding.
- To achieve this objective each zoo shall maintain a stud book or herd book; a breed registry
- This is particularly important in respect of every endangered species.
- To safeguard against uncontrolled growth in the population of prolifically breeding animals, every zoo shall implement appropriate population control measures like
    - Separation of sexes
    - Sterilization
    - Vasectomy
    - Tubectomy
    - Implanting of pallets

PPT-106: Record Keeping

Maintenance of Records:

Every zoo shall keep the record of all animals in terms of their Birth, Acquisitions, Sales, Disposals and Death.

Every zoo shall prepare and maintain an inventory record

Zoo ID, Animal ID, Scientific name, Sex, Origin, Birth, Parents, Death, Out of stock

Every zoo shall prepare and maintain a daily record:

Health, Behavior, Feed and Feeding, Management, Health Care, Problems if any.

Every zoo shall also prepare a brief summary and an annual report of the activities of the zoo for every financial year particularly.

Death of the animals in the zoo with reason of death identified on the basis of

- Post-mortem reports
- Diagnostic tests

PPT-107: Education & Research

Education is one of the main roles of zoos and aquaria today. Millions of people visit zoos and aquaria worldwide each year this means that the zoo community can reach a very large group of people and explain the importance of conservation. Zoos enable visitors to learn about our natural world and thereby respect nature in all its forms.

Every enclosure in zoo shall bear Sign boards (displaying scientific information).

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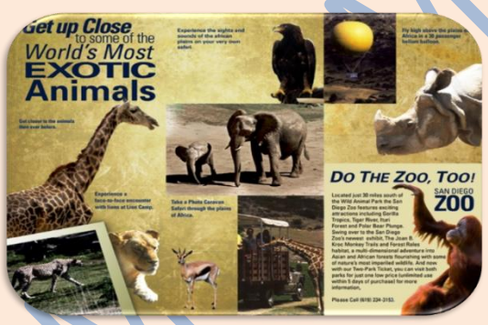
Every zoo publish literature and make the same available to the visitors, either free of cost or at a reasonable price Leaflets, Brochures, Guidebooks.



Every large and medium zoo shall make arrangements in the form of

- Recording,
- Writings,

To study, Biological behavior, Population dynamics, Veterinary care of the animals.

Every large and medium zoo shall make a detailed database .The database shall be exchanged with other zoos.

PPT-108: Visitor facilities

Civic Facilities: The zoo operators shall provide adequate civic facilities at convenient places in the zoo for visitors Toilets, Visitors sheds, setting arrangements, Drinking water points.

Access to Disables: Arrangements shall be made to provide access to the zoo disabled visitors including those in the wheel chair.

Warning signs: Warning signs should be in place to warn visitors of possible risk. Animals could bite or peck a visitor. Animals with horns could also cause injury. Risk of an electric fence or an edge which poses a risk of falling.

First-Aid equipment

First-aid equipment including anti-venom shall be readily available in the premises of the zoo.

PPT-109: Planning & Development

Policy & plans

Each zoo shall prepare policies and plans for its development. A policy lists everything (Timetables, Goals). It gives an idea of the desired direction of Zoo. Policies are documents that are meant to guide decisions and to achieve certain goals. For example, a safety policy should describe in detail what to do in case of animal escapes, fire, or other emergencies. Acquisition & Disposition policy

Master plane:

A master plan should be made for the next 5 to 25 years. A master plan creates a vision that is supported by policies, guidelines, and priorities. It guides the development and evolution of the zoo.

The Planning Team

The planning team that creates the master plan should involve. The Director, Curators, Architects, Veterinarians, Staff from keeper and Education departments' etc. Species Specialist (for endangered species). May or may not be supplemented with outside consultants. By doing so, a varied group of people is formed. It will also reduce the amount of time spent on adjustments after construction is finished

Management plan: Management plan, giving details for the proposal and activities of development for next six years.

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Topic: Endangered Species of Pakistan

PPT-110: Endangered Species

Categories of Endangered Species

"Species of organism which are in danger of extinction"

The endangered species are classified into three categories

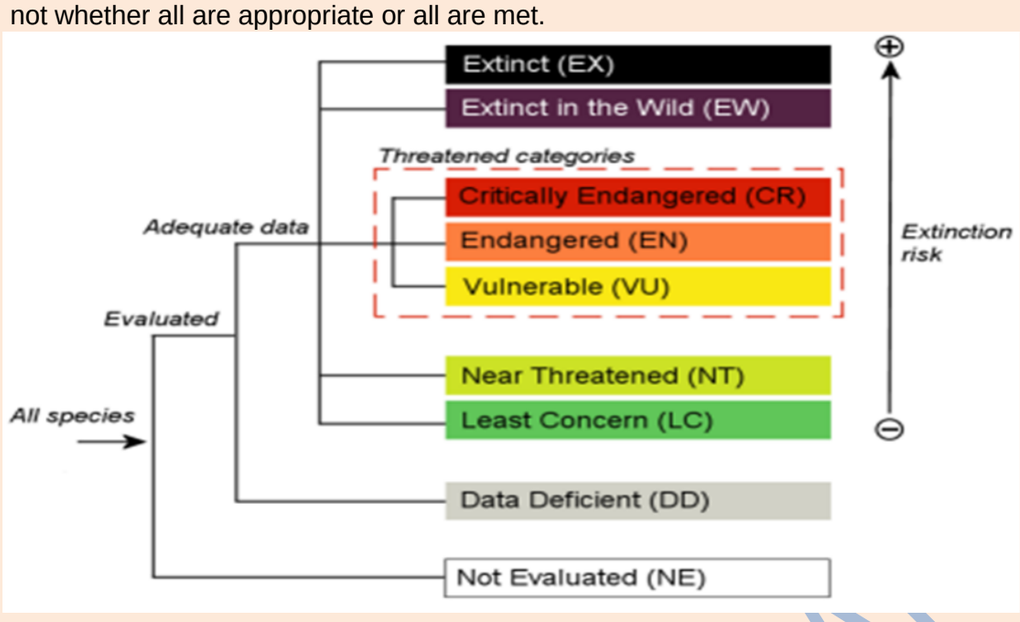
- Critically Endangered(CR)
- Endangered(EN)
- Vulnerable (VU)

Categorization process should only be applied to,

- Wild populations inside their natural range.
- For listing the organism in any of the category there is a range of quantitative criteria.
- Meeting any one of these criteria qualifies a taxon for listing at that level of threat.
- Each taxon should be evaluated against all the criteria.
- Some criteria will be inappropriate for certain taxa.

▪The relevant factor is

- whether any one criterion is met
- not whether all are appropriate or all are met.



The Categories

Extinct (EX)

When there is no reasonable doubt that the last individual has died

Extinct in the Wild (EW)

When a taxon is known only to survive in Cultivation, Captivity, Naturalized population (or populations) well outside the past range. When exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.

Critically Endangered (CR)

When a taxon is facing an extremely high risk of extinction in the wild in the immediate future

Endangered (EN): When a taxon is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.

Endangered (EN)

Those which are abundant in their range but are gradually declining in total numbers.

Vulnerable (VU)

When a taxon is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.

Data Deficient (DD)

When a taxon has an inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category

- May be well studied
- Its biology well known.

Appropriate data on abundance and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk

Not Evaluated (NE) When a taxon has not yet been evaluated against the criteria.

PPT-111: Measures to Save Endangered Species

Many factors operate independently or in various combination for destruction or extermination of various species. Some species are more susceptible than others which make them endangered species.

Learn about endangered species in our area.

Research & Documentation

Listing of endangered species

- Current population size
- Food and feeding habits

Give awareness about the importance of wildlife

- Medicinal sources, Commercial, Aesthetic, Recreational benefits.

Habitat Protection & Preservation

The greatest threat that faces many species is the widespread destruction of habitat. Protection of the special places where they live.

Do not use toxic herbicides or pesticides

Certain herbicides and pesticides are horrible pollutants that causing severe damage to the environment and animals dependent upon. Find alternative ways to reduce negative effect on the wildlife in the area. These are hazardous pollutants that affect wildlife at many levels. Many herbicides and pesticides take a long time to degrade and build up in the soils or throughout the food chain. Predators such as hawks, owls and coyotes can be harmed if they eat poisoned animals. Some amphibians are particularly vulnerable to these chemical pollutants.

Avoid products made from endangered species

Overseas trips can be exciting and fun, and everyone wants a souvenir. But sometimes the souvenirs are made from species nearing extinction. Avoid supporting the market in illegal wildlife trade including Tortoise-shell, Ivory, Coral, Snakes, Turtles and lizards, live monkeys or apes. Be careful of products including Fur from tigers, polar bears, Crocodile skin, Medicinal products made from rhinos, tiger or Asiatic black bear, Most like birds including Parrots, Macaws, Finches.

Harassing Wildlife is Cruel and illegal

Certain acts are illegal and can lead to the extinction of wildlife. Shooting, Trapping, Forcing a threatened or endangered animal into captivity

PPT-112: Endangered Species of Pakistan

The IUCN Red List of threatened species lists 45 species of internationally threatened animals occurring in Pakistan.

- 4 CR
- 12 EN
- 29 VU

Out of these 45 species

- 18 Mammals
- 17 Birds
- 9 Reptiles
- 1 Fish

Most of these endangered species are found in Northern Areas. Pakistan houses to a variety of endangered animal species. Woolly flying squirrel, Markhor, Blue whale, Pakistan sand cat, Ibex wild goat, Snow leopard Marco Polo sheep, Indus stream dolphin, Mountain Weasel, Asian Black Bear, Baluchistan Forest Dormouse, Black Finless Porpoise. European Otte, Vole, Branded Eagle Ray, Tuna, Siberian Cranes, Green Sea Turtle, Long Billed Vultures.

PPT 113-115: Snow Leopard

Scientific Name: Panthera Uncia

Description:

The snow leopard, is strikingly different from the common leopard in appearance. It is recognizable by its Long tail, Almost-white coat spotted with large black rosettes. Dark rosettes and spots markings appear less well defined and are spaced further apart. Thick fur patterned with markings is the perfect camouflage for their rocky habitat, allowing them to stalk their prey. This pattern is unique to each individual snow leopard. Their beautiful coats are also made up of long hairs with a dense, woolly under fur to protect them against the cold. Snow leopards have longer tails than other big cats, up to 1 m in length and help the leopards to balance on steep and rocky slopes. Snow leopards are solitary animals, it is rare to see two snow leopards together. Unlike other large cats, snow leopards cannot roar. They can mew, growl, yowl and prusten. Body size can be up to 1.3m length Weight up to around 70kg.They can jump as much as 50 feet (15 meters).They mate in late winter, between January and mid-March. Males and females stay together for a short period. Males do not participate in rearing the cubs. The gestation period is 98 - 104 days. The litter size can be between 1 - 5 cubs, though 2 - 3 is more usual.

Snow leopards' favored prey are herbivores

Blue sheep, Argali sheep, Ibex, Markhr, Musk deer, Marmots and various species of hare and birds. In many areas, snow leopards also prey on livestock, bringing them into conflict with herders.

Distribution: Snow leopard generally inhabits elevations between 2000-4000m

Baluchistan, Chitral, Gilgit, Upper Swat valley, Slopes of Nanga Parbat, Khunjrab N.P, Chitral gol N.p, Central Asia, Atli, Pamir, Hindu Kush, Karakorum, Himalaya

Population status

Estimated population of the snow leopard is between 3,920-6,390

- Afghanistan 100-200
- Bhutan 100-200
- China 2,000-2,500
- India 200-600
- Kazakhstan 100-110
- Mongolia 500-1,000
- Nepal 300-500
- Pakistan 200-420
- Russia 70-90
- Tajikistan 180-220
- Uzbekistan 20-50

There are as few as 6000 approximately snow leopards in the wild. Their numbers are declining due to habitat loss, poaching and the impact of climate change. Threat Status, Endangered.

Major threats to snow leopards

1. **Poaching**

Snow leopards have long been killed for their Beautiful fur, Bones, Body parts, Traditional Asian Medicine.

2. **Conflict with communities**

Retaliation for attacking herders' livestock. Decline in the leopard's natural prey is forcing them to rely more on livestock for food and increasing the risk of retaliatory killings. Due to hunting, competition from increasing livestock herds, and habitat loss.

3. **Shrinking home:** Snow leopards need vast areas to thrive**.** Expanding human and livestock populations are rapidly encroaching on their habitat. New roads and mines are also fragmenting their remaining range.
4. **Changing climate**

All the threats will be exacerbated by the impact of climate change on the fragile mountain environment. Hence, putting the future of snow leopards at even greater risk.

5. **Lack of effective law enforcement.**

PPT 116-117: Striped Hyaena

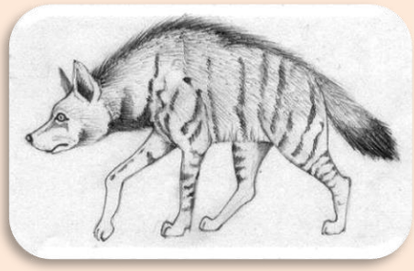
Scientific Name: Hyaena hyaena

IUCN status: Critically Endangered

Description

Hyena's are large sized dog like carnivores with big head, massive cheek teeth, carnassials well developed, long developed fore legs and each foot has four toes with non-retractile claws. Body fur with yellowish fawn ground and in distinct broad vertical black stripes with close set black stripes on legs. The Striped Hyaena has a conspicuous crest of longer hair extending like a mane from the crown of the head to the pelvis. The ears lack any bursa or pouch-like fold on their outer margin and are sharply haired and black skinned. The legs are relatively long and slim. The dorsal crest generally has black hair and these are erected when the animal is nervous or excited. Voice is almost human like, it can also imitate the cries of other animals by which means dogs, calfs and sheep are deceived. They are scavengers feeding on carrion but will also attack on live cattle.





Habitat

- Rocky areas
- Hot desert
- Wild open valley
- Semi-desert areas.

Distribution

In Pakistan, it is distributed in Hilly tracks of Baluchistan & Sindh

Recently Known Localities

Kall, Bhal, Palugram, Daphar Plantation, Jals park, Qaderabad, Sukh-Beas near Chunian & Changa Manga, Kirthar National Park

Threats

It is considered as an enemy species .Due to the non-availability of natural food it tends to scavenge near human habitations and increasing incidents for its killing.

PPT 118-120: Sand Dune Cat

Scientific Name: Felis margarita

National Status: Critically Endangered

IUCN Red list Threat Status": Least Concern

The Sand Cat is a true desert dweller. Only felid to occur exclusively in desert habitat.

Description

The coat is soft and dense. Mostly pale sandy brown to light grey. Slightly darker on the back and whitish on the belly. Body fur not spotted. Size small ranging from 45-50 cm.Forehead unspotted, Chest creamy white, Height: 24-30 cm (10-12″), Weight: 1.3-3.4 kg (3-7.5 lbs), Tail Length: 23-31 cm (9-12″). They have numerous adaptations to an arid life and colouring that blends in with their environment. A reddish streak runs across each cheek from the outer corner of the eyes. The lower half of the face and chest is whitish to pale yellow. The tawny reddish ears are black tipped, as is the tail, which also has a few narrow black rings near the tip. The broad head has large eyes placed greatly forward. Low set, large, tapered ears provide keen hearing for habitat where prey is scarce. Long, dense, hairs covering the soles of the feet; a desert adaptation. Providing insulation from the hot sands. Helping them move across shifting surfaces. They have evolved a thick coat which insulates them from the alternating intense heat and cold of desert environment

Reproduction

Breeding in the wild is seasonal with births born January-April. Gestation period of 60 – 67 days. Usually 3-4 – kittens are born annually in a burrow or among rocks. Weight at birth is 50 – 60 grams. At two weeks their eyes open. They first venture outside at three to four weeks. Have

their first solid food at five weeks. They become independent at three to four months. Sexual maturity is reached at about 9 – 14 months. . They have lived to 18 years of age in captivity.

Felis margarita Distribution Native

Algeria, Chad, Egypt, Iran, Ira, Jordan, Kazakhstan, Mali, Mauritania, Niger, Oman, Saudi Arabia, Sudan, Syrian, Arab Republic, Turkmenistan, United Arab Emirates, Kuwait, Uzbekistan, Western Sahara

Pakistan; reported in Baluchistan only

Ecology

Sand Cats are prolific diggers .Digging is necessary to construct and improve burrows, and dig rodents out of the sand.Claws do not fully retract and are not very sharp. Most likely blunted by digging. They will drink water if it is available but can survive on the moisture received from their prey. Enemies include, Venomous snakes, Jackals, Large owls Among Saharan nomads, Sand Cats have a reputation for being snake hunters. These cats cover large kills with sand and return later to feed. Primarily a nocturnal animal.They spend the hot daylight hours in a shallow large burrows dug into a dune or beneath a shrub. They are active throughout the night, hunting and travelling 5-10 km. Before retiring below ground at dawn, a lookout position is adopted at the mouth of the burrow. Sand Cats are solitary animals with a very low population. They make use of a loud mating call, much like the barking of a small dog. The loud barking, combined with excellent hearing, enables these cats to find each other over great distances. Other vocalizations include mewling, growling, spitting, hissing, screaming and purring much as in domestic cats. Grooming and defense behaviour is also similar to domestic felines.

Threats

Habitat degradation and loss are considered to be the major threats to the Sand Cat. Many areas are also more heavily frequed by humans, their domestic animals and commensals (i.e. red fox, Vulpes vulpes.

- Arid ecosystems are being rapidly converted.
- Infrastructural development
- Human settlement and activity
- Degradation occur through livestock grazing
- They are also killed in retaliation for killing chickens or Houbara and MacQueen's bustard
- Locally, Sand Cats may be threatened by the pet trade. In Iran, Sand Cats are reported to get killed by shepherd dogs and trapped in snares set for other species.
- Desert ecosystems, caused a decline in prey base. Introduction of feral and domestic dogs and cats creating direct competition for prey and through predation and disease transmission. They are also killed in traps laid out by inhabitants of oases targeting Red Fox, Rüppel's Fox and Golden Wolf (jackal) Canis anthus.

Conservation Action

Hunting of this species is prohibited in many countries including its native countries. On the African continent, the Sand Cat inhabits several protected areas. Captive breeding populations exist in the range country.

121 to 123: Panther

Scientific Leopard: Panthera pardus

National status: Critically Endangered

IUCN Red list Threat Status: Vunerable

Description

Leopards can adapt to any kind of land habitat

- Low land forests
- Mountains
- Grasslands and deserts.

Body size and color patterns of leopards varies geographically. Probably reflects adaptations to particular habitats. Black panthers, which are most populous in humid forests, are leopards with recessive melanistic genes. Savannah and woodland leopards tend to be relatively large while mountain and desert leopards tend to be relatively small. Leopards have short legs relative to their long body. They have a broad head, and their massive skull allows for powerful jaw muscles. Savannah and woodland leopards tend to be relatively large while mountain and desert leopards tend to be relatively small. Leopards have short legs relative to their long body. They have a broad head, and their massive skull allows for powerful jaw muscles. Coat ranges from tawny or light yellow in warm, dry habitats to reddish-orange in dense forests. Subspecies are distinguished according to unique pelage characteristics. Black rosettes on the body are circular in East Africa and square in South Africa. They have solid black spots on their chest, feet, and face and rings on their tail. Cubs have a smoky gray coat and their rosettes are not yet distinct. Leopards are sexually dimorphic as males tend to be larger than females. Females 17 to 58 kg ,Male 31 to 65 kg Females length from 1.7 to 1.9 m. Males length from 1.6 to 2.3 m. Nocturnal, rests in the day on a branch of tree, in dense vegetation or among rocks Progresses by a silent walk but can run upto a speed of 60km/h. Preys upon animals like goats, sheep, monkeys, rodents, etc. Typical lifespan in wild 10 to 12 years





Reproduction:

Leopards are promiscuous, as both males and females have multiple mates. Females attract potential mates by excreting pheromones in their urine.The reproductive season is year round but peaks during the rainy season in May. Average age at sexual or reproductive maturity (female) 2.5 years Average age at sexual or reproductive maturity (male)2 years.In China and southern Siberia, leopards mainly breed in January and February. The female produces two to four, usually three, cubs. Gestation last 96 days. Typically, females stop reproducing around 8.5 years old.

DISTRIBUTION

Sub Saharan Africa

- North Africa(As remnant population)
- Arabian peninsula
- Turkey
- Asia
- Himalayan foothills
- India and China.

Threats

- The primary threats to Leopards are anthropogenic.
- Habitat fragmentation
- Reduced prey base
- Conflict with livestock
- Game farming have reduced Leopard populations throughout most of their range
- Leopards are targeted for
- Trophy hunting
- Illegal wildlife trade for their
- Skins (used in traditional ceremonies)
- Bones and other parts (used for medicinal purposes in eastern cultures).
- In Indo-Malaya and China, a recent reports estimate very high levels of Leopard removal at four individuals per week for 10 years

- These trades can have a substantial impact on local Leopard populations.

Conservation Actions

- The Leopard is included in CITES Appendix I.
- Trade of Leopard skins and products is restricted in 11 countries in sub-Saharan Africa.
- Zambia placed a moratorium on Leopard and Lion hunting.
- To address the use of Leopard skins for traditional ceremonies, conservationists in South Africa have partnered with textile companies and communities to provide faux-fur alternatives.

PPT 124-125: Wild Ass

Scientific Name: Equus hemionus

National status: Critically Endangered

IUCN Red list Threat Status: Near threatened

Description

The Indian wild ass are significantly larger than donkeys 200-290 kg in size, 2.1-2.5 m in head-body length. Coat is usually sandy, but varies from reddish grey, fawn, to pale chestnut. The animal possesses an erect, dark mane which runs from the back of the head and along the neck.The mane is then followed by a dark brown stripe running along the back, to the root of the tail. The belly, buttocks and muzzle are white.

Habitat

The Asiatic wild ass inhabits. Flat steppe, Semi-desert, Desert. They are always found within 30 km of a source of water

Biology and Behaviour

Indian wild asses graze between dawn and dusk. The animal feeds on grass, leaves and fruits of plant, crop, Prosopis pods, and saline vegetation. They can breaking up woody vegetation with its hooves to get at more succulent herbs growing at the base of woody plants. Males are larger than females. Stallions live either solitarily, or in small groups of twos and threes Family herds remain large.Mating season is in rainy season. Gestation period in this species is 11 months. Most births occur from April to September. Females with young tend to form groups of up to five females. The mare gives birth to one foal. The male foal weans away by 1–2 years of age, while the female continues to stay with the family herd.

Distribution Native

China, India, Iran, Islamic Republic of Mongolia, Turkmenistan

Regionally extinct

Afghanistan, Armenia, Azerbaijan, Georgi, Iraq, Jordan, Kuwait, Kyrgyzstan, Lebanon, Russian Federation, Saudi Arabia, Tajikistan, Turkey, Ukraine

It was once found in Pakistan. As far west as Baluchistan, Tharparkar, Sindh) uptill the late 60s.

Threats

- Illegal trade seems to happen primarily on a national level.
- Poaching for meat, hides and fat, is believed to have apparent medicinal properties.
- Overgrazing by livestock reduces food availability, and herders also reduce the availability of water at springs. The cutting down of nutritious shrubs and bushes exacerbates the problem.
- A series of drought years could have devastating effects on this species
- Habitate fragmentation is a particular concern in Mongolia as result of the increasingly dense network of infrastructure

Conservation action

The Asiatic wild ass is included in CITES Appendix I.They does occur in a number of protected sites where targeted conservation action has been taken Reintroduction

- Israel
- Kazakhstan
- Uzbekistan

Domestic animals have been removed from some protected areas.Artificial watering holes have been made. There are hefty fines for poaching. To encourage the involvement of local people in the conservation of the Asiatic wild ass.

PPT-126 to 127: Marco Polo Sheep

Scientific Name: Ovis ammon polii

National Status: Critically Endangered

IUCN Red list Threat Status: Near threatened

Marco polo sheep is one of the nine Argali subspecies. The name ‘Argali' is the Mongolian word for wild sheep. It is the largest species of wild sheep.

Description

The general coloration varies between each animal. Light yellow to a reddish-brown to a dark grey-brown.. Argali from the Himalayas are usually relatively dark. Russian ranges argali are often relatively pale. The legs and belly are creamy-white without any darker pattern on the frontal area. The neck in the rams tends to be heavy and muscular .The tail is short and not bushy. In both sexes the legs appear relatively long and slender. The face, tail and the buttocks are yellowish-white. The male has a whitish neck ruff and a dorsal crest and is usually slightly darker in color than the female.Males have two large corkscrew shaped horns

Measuring 190 cm (6.2 ft) in length, Weighing up to 23 kg (51 lb). Males use their horns for competing with one another. Females also carry horns, but they are much smaller measuring less than 50 cm (20 in) in total length.

Habitat

Alpine areas, High mountains, Snow fields, Generally avoid forested areas. .Prefer to occupy open areas with a gentle slope.

Biology and Behaviour

Argali feed on grasses, sedges, and some herbs and lichens. They regularly drink from open springs and rivers**.** Argali are gregarious and live in groups from 2-150 individuals. Gestation is about 160 days. Females give birth to one offspring (twins are occasionally reported**.** Mothers separate from the herd to give birth and remain alone with her offspring for several days .Females are sexually mature at 2 years .Males may not sexually mature until 5 years. Maximum life-span is 10-13 years .Wolves are their primary natural predator.

Distribution Native

Afghanistan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Russian Federation, Tajikistan, Uzbekistan.

Marco Polo sheep is not a resident species of Pakistan. It moves across international borders between the four range countries. They may migrate into Kilk-Mintaka area of Pakistan for safety during summers.

Threats

- Over-hunting (for trophy)
- Poaching (for meat)
- Competition displacement.Livestock feed on the same forage as argali, dogs chase and even kill argalis
- Possibly disease transmission by domestic livestock
- Habitat loss.

Conservation action

Argali are included on Appendix I&II of CITES. A number of trophy hunting areas have been established in China with argali as the focal species. These areas have generally succeeded in reducing poaching. Research and conservation plans for argali has been approved by the Governments of its areas of native distribution.

Conservation measures are desperately required

Implementation of Conservation Management Plans. Improve enforcement of existing legislation that would help to conserve argali. Enhance conservation management in protected areas where argali are found. Develop public education programmes to raise awareness of the status and threats to the species.Continue ecological research, monitoring population trends, and studying the impacts of threats

PPT: 128-129: Great Indian Bustard

Scientific Name: Ardeotis nigriceps

National Status: Critically Endangered

IUCN Red list Threat Status: Critically Endangered

Description:

It is a tall, long legged bird. Large, brown-and-white bustard with black crown and wing markings**.** There is a black crown on the forehead and the upper body is brown. The wings are marked with black, brown and grey**.** The sexes are similar in appearance**.** Males have larger black crown long hind crown feathers**.** Black band across the breast**.** Length: 122 cm**.** Females are smaller, with greyer neck. Typically no or incomplete breast-band**.** Length: 92 cm**.** regarding voice, booming moans during display and barking or bellowing sounds when alarmed. General coloration varies between each animal, from a light yellow to a reddish-brown to a dark grey-brown.

Habitat

Arid, Semi-arid grasslands with scattered short scrub, bushes and low intensity cultivation in flat or gently undulating terrain. Birds congregate in traditional grassland patches

Biology and Behaviour

Nests are situated in the open ground and males take no part in incubation or care of the developing young. Only a single egg is usually laid. Feed on a wide range of items depending on their seasonal availability. Grasshoppers and beetles are the preferred diet. Alternatively, they can take Grass seeds, Berries, Rodents, Reptiles. Rajasthan they are known to take Indian spiny-tailed lizards in cultivated areas, they feed on crops such as exposed groundnut, millets and pods of legumes

Distribution Native: India, Pakistan

Threats

- High intensity Poaching
- Widespread hunting for sport and food
- Vehicular access to remote areas
- Egg-collecting was rampant in many states of India
- Habitat loss and degradation
- Lack of community support

Conservation action

- This bustard is included in Appendix I of CITES
- In India it is legally protected and there are severe penalties for killing an individual
- Establishment of Protected areas specifically for the species
- Rehabilitation of grasslands has benefited the species in some areas.
- Removal of invasive weed species
- Conducting a school awareness programme and large-scale community awareness programme.
- Publicity materials and media stories have been produced to raise awareness of the species in India
- Consumptive human use should not be permitted during breeding months
- To formulate landscape conservation strategies in priority areas for accommodating the species's non-breeding needs.
- Evidence-based habitat management interventions should be planned and implemented

PPT 130-131: Indus Dolphin (Bhulan)

Scientific Name: Platanista minor

National Status: Endangered

IUCN Red list Threat Status: Endangered

The Indus River dolphin is one of the world's rarest mammals. Second most endangered freshwater river dolphin.

Description

It has a long beak which thickens towards the tip, large teeth. Body is stocky with rounded belly. Flippers are large and paddle shaped. Forehead is steep. Poorly seeing eye. Approximately 1,100 specimens of this species exist today. Eye hasn't developed a lens, the dolphin still uses its eyes to differentiate between light and dark.Tail flukes are broad in relation to body sizeGrey brown in colour, sometimes with a pinkish belly.Males smaller than females Length 1.5 and 2.5m. Weight range 70-110 kg with maximum of 90kg. Travels mostly as couples or solitary, Navigation, by echolocation system. The physical touch gives the dolphins important information about their surroundings and helps them find food. Both gender reach sexual maturity. Between six and ten years of age or until they reach a length equal or greater than 1.7 meters. Gestation period is 8-9 months. Single calf birth Diet: fish and crustaceans.

Habit & Habitat

These dolphins favour silt laden, turbid waters of the Indus river system. At temperature 8C° and 33C°

- Deepest river channel
- Deep, low-velocity water

Less common in secondary channels and small braids. During the low-water season (October to April), barrages divert almost all river water such that dolphin habitat downstream of Sukkur Barrage and in some tributary segments has been eliminated. In dropped water levels in the winter, dolphins are concentrated in the remaining deep areas.

Distribution

Native

India, Bangladesh, Nepal, Pakistan, From Kotri , Sindh to Jinnah , northern western Punjab. Sukkur and guddu barrage as Indus river dolphin rescue in 1974. Historically it occurred in Indus mainstream, Sutlej, Beas, Ravi, Chenab, Jhelum tributaries

Threats

Human development. The construction of dams and dikes segments the populations reducing the mature individuals to mate. It also reduces their habitat because they cannot move freely through these structures.

- **By catch**

They commonly get trapped in gillnets, longlines or other fishing gear intended to catch fish.

- **Direct hunting**

Some people kill them for their meat and oil or to use them as bait or even to prepare alternative medicines.

- **Pollution**

Habitat contamination due to industrial, agricultural and domestic activities.

- **River traffic**

The high traffic in the river cause collisions with the propels of boats that injure them severely.

Conservation action

Included in Appendix I of CITES

- The species is legally protected in all range states and occurs in a number of national parks and other designated areas, including dolphin reserves or sanctuaries.
- In 1972, dolphins were protected under the Wildlife Act of Sindh.
- In 1974 the government of Sindh declared the Indus River between the Sukkur and Guddu Barrages a dolphin reserve.
- The government of Punjab prohibited deliberate killing of dolphins in the Punjab Wildlife Protection Act in 1974
- Establishment of the Taunsa Wildlife Sanctuary and Chashma Wildlife Sanctuary in 1983 and 1984, respectively
- United Nations Development Programme (UNDP) to rescue dolphins trapped in irrigation canals and return them to the Indus mainstem has had some success in reducing mortality

Indus River Dolphin conservation Project (IRDCP)

Since 2000, WWF-Pakistan has been working in collaboration with the Sindh Wildlife Department on the conservation of the Indus River Dolphins.

PPT 132-133: Saker Falcon

Scientific Name: Falco cherrug.

Description

There is Great variation in colour and pattern exist. Fairly uniform chocolate brown colour to a pale sandy colour with brown bars or streaks. Some are almost pure white individuals, which are particularly prized by Arab falconers. Saker females are markedly larger than males. Females typically Weigh 970 to 1300g ,Length of 55 cm. Wingspan of 120 to 130 cm. Males usually have weigh from 730 to 990g, 45 cm long ,wingspan of 100 to 110 cm. Sakers have sharp, curved talons, used primarily for grasping prey. Sakers use their powerful, hooked beak to sever the prey's vertebral column. The saker falcon is a large species of falcon It is a large, powerful bird of prey with an exceptionally broad wingspan for its size.

Biology and Behaviour

This bird is physically adapted to hunting close to the ground in open terrain, combining rapid acceleration with high manoeuvrability. Specialising on mid-sized diurnal terrestrial rodents (especially ground squirrels.

Semi-desert, Steppes

In some areas, particularly near water and even in urban environments.This species usually builds no nest of its own. Uses an old stick nest in a tree which was previously used by other birds. Clutch size varies from three to five, exceptionally two to six. The species usually occurs singly or in pairs

Range lifespan

Wild: 10 (high) years. Captivity: 25 (high) years. Birds life style largely depending on the extent to food supply.They are sedentary Part-migratory or fully migratory.

Range Distribution

Wide range across the Palearctic region from eastern Europe to western China

Possibly extinct: Germany

Regionally extinct: Turkmenistan

IUCN Red list Threat Status: Endangered.

Threats

This species suffered mainly from electrocution on power lines. Decreased prey availability due to the loss and degradation of steppes. Dry grasslands through agricultural intensification. Plantation establishment and declines in sheep pastoralism. Off take for falconry has also been a serious problem (especially trapping of breeding birds). Pesticide use leading to secondary poisoning.

Conservation action

Included in Appendix II of CITES. Controls of illegal trade are implemented in various countries in western range. Captive breeding has been developed strongly in some countries, including U.A.E., as a means of substituting farmed for wild-caught birds. Clinics have also been set up to improve the longevity and availability of wild-caught birds in various Gulf States. New research programmes in many parts of the range have begun to establish baseline data on distribution, population, ecology and threats. Maintainance or improving systems of wardening and customs control, including DNA sampling to check provenance of traded birds.

PPT-134: Woolly Flying Squirrel

Scientific Name: Eupetaurus cinereus

National status: Endangered

IUCN Red list Threat Status: Endangered

Description

The animal has fur that is long and thick, with a grizzled pattern that gives the appearance of a woolly pelage, thus the name. The woolly flying squirrel is slightly larger in body size. Smaller bushy tail than the other species inhabiting Pakistan. The dorsal fur is brownish grey having a scattering of pale buff-tipped hairs. Ears are slightly smaller. Feet are comparatively larger and stronger than *Petaurista*. The cheek teeth are unique as they are both flat-crowned and high crowned- hypsodont. It feeds on very abrasive plant material, including pine needles.

Habitat and Ecology

It is currently known to live only in caves and crevices on steep cliffs in the dry conifer forest zone of northern Pakistan. This animal is confined in Kashmir, Pakistan. It is strictly nocturnal highly dependent upon pine needles in its diet.

Distribution: **Native:** Pakistan

Threats

- Habitat loss due to large-scale clear-cutting of forests
- Expansion of agriculture
- Small-scale logging
- Infrastructure development
- Human settlements

PPT-135: Indian Pangolin

English Name: Scaly Ant eater

Scientific Name: Manis crassicaudata

National status: Vunerable

IUCN Red list Threat Status: Endangered

Pangolins are considered to be the most traded wild animal in the world

Description

The Indian Pangolin has Relatively tiny head, Hump-backed body. Thick tapering tail almost equal in length to its body. They are completely covered with scales. Made of keratin which is

getting harden as the creatures get older. The scales bear fine longitudinal striation on their surface. There is hardly any external ear. The muzzle tapers to a narrow, down-curving snout. The hind legs are stout and rather columnar with five blunt pinkish white toe nails.

Habitat and Ecology

It occurs in various types of tropical forests as well as open land, grasslands. Degraded habitat, including in close proximity to villages. The species is thought to adapt well to modified habitats. Provided its ant and termite prey remains abundant. The animal is Solitary, Nocturnal, Burrow-dwelling. During mating season, adult males and females share the same burrow. Females usually give birth to one young. Gestation period of 165 days. Longevity in the wild is unknown. In captivity it has been recorded up to 13 years 2 months. This species is arboreal in some habitats, and is a good climber, using its prehensile tail and claws to climb trees

Distribution

Native:

India, Nepal, Pakistan

Mangla,Potohar and Salt Range across Indus south to near Karachi and northward in the mountainous areas upto Kallat

- Sri Lanka
- Possibly extinct:
- Bangladesh

Threats

Primarily threatened by Hunting, Poaching (for meat and scales), Illegal international trade. Up to 100,000 pangolins are estimated to be hunted and sold every year its meat is consumed as a source of protein locally. The meat is considered a delicacy in China, Vietnam and other parts of south-east Asia. Scales are used in whole or powdered form in the preparation of traditional medicines. An increase in the Agrarian economy Improved irrigation. The use of pesticides comprise additional threats to this species. Occasionally killed out of fear for having an odd shape

Conservation Actions

The species is included in CITES Appendix II. It is protected by National legislation in

- Bangladesh, India, Pakistan, Nepal, Sri Lanka, China

It is widely distributed and present in a number of protected areas. There is a need for further research into current population levels, ecology, biology and natural history of this species throughout its known range to prevent poaching.

PPT 137-138: Hog Deer

Common Name: Para

Scientific Name: Axis porcinus

National status: Vunerable

IUCN Red list Threat Status: Endangered

Description

It is Smaller and stouter in built and hog like in appearance. Small deer with short delicate legs and rather bulky heavy body.Its pelage is coarse .General coloration is dark olive-brown,lacking any rufescent tinges when viewed from a distance. It has round ears which are fringed from inside with white hairs. Some adults (especially females) have scattered pale spots in their summer coat (particularly on either side of the darker dorsal line) The short tail is quite bushy. The surface of the horns is somewhat smooth with less corrugation. Lives solitary or in pairs.Average antler size is 30-38 cm. Females are slightly smaller and without antlers.

Habitat and Ecology

Shrub dominated wetlands. Artificial terrestrial plantations like Changa Manga ,Riverine area, It prefers to live in grassy patches bordering forests.

Distribution

Pakistan

- Changa Manga Plantation
- Head Qadarabad
- Ferozwalla
- Head Marala
- Taunsa wildlife Sanctuary
- Riverine forests in Sindh

Para Axis porcinus

Distribution

Native:

- Bangladesh, Bhutan, Cambodia, India, Nepal

Possibly extinct:

- China, Myanmar, Viet Nam

Reintroduced:

- Thailand

Introduced:

- Australia**,** Sri Lanka**,** United States

Threats: Hog Deer is hunted in various parts of its range. It is hunted for Meat (bushmeat trade). Traditional medicinal products.

Trophy antlers: It is also possible that hunting could be stimulated by demand for captive animals. **Conservation Actions**

Hog Deer is fully protected in Bangladesh,India. One subspecies is listed on CITES Appendix I. It is protected by National legislation in countries of its range

PPT 139: Kashmir Flying Catcher

Scientific Name: Ficedula subrubra

IUCN Red list Threat Status: Vulnerable

An insectivorous species. Breeds in the north-west Himalayas in the Kashmir region of the Indian Subcontinent. It is migratory and winters in the hills of central Sri Lanka and the Western Ghats of India.

Description

This species is 13 cm long. Males have a Grey-brown back with an orange-red throat.Females have Slightly browner upperparts. The red of the under parts may be reduced to just a pinkish wash.

Habitat and Ecology

It breeds from May-June in temperate, mixed deciduous forests. It nests in natural hollows and holes. It winters in gardens, tea estates, forest edge and disturbed areas within forest, generally above 750m.

Distribution: **Native:** India, Nepal, Pakistan, Sri Lanka

Threats

The major threat is loss and degradation of its breeding habitat due to Commercial timber extraction. Conversion of land for agriculture. Livestock-grazing which has substantially altered forest understorey structure and composition Tree-lopping for animal fodder, fuel wood and construction materials.

Conservation Actions Proposed

Conduct surveys, detailed research, across and into its breeding range, to establish its current population status

PPT 140-141: Indian Spotted Eagle

Scientific Name: ***Clanga hastate***

IUCN Red list Threat Status : Vulnerable

South Asian bird of prey.

Description

A medium-sized eagle about 60 cm in length and has a wingspan of 150 cm with a short tail. Adults are essentially brown. The legs appear longer and thinner due to the tarsii being less thickly feathered. This species has a lighter coloration overall compared to its relatives with a darker iris that makes the eyes appear darker than the plumage. The young birds are giving a spotted appearance glossy brown. Tips of the head and neck feathers being creamy. The upper tail coverts are light brown with white giving a barred appearance. The median coverts have large creamy spots. After about eighteen months the bird moults and becomes a darker shade and has less spots.

Distribution

Native:

- Bangladesh, Nepal, Pakistan, Cambodia, India, Myanmar

Vagrant

- Pakistan

Habitat and Ecology

This species is a powerful predator that seizes its prey from the ground. It preys on Frogs, birds and mostly mammalian. It is a tree-nesting species. It favors open habitats with Low intensity agriculture, Wetlands, Open forest and forest clearings year-round. Its display flight includes Switch-backing, wing-clapping and full loops. Courtship has been observed from January, with laying in April.

Threats

Primarily threatened by Conversion and disturbance of forested habitats within its range.

PPT 142-143: Egyptian Fruit Bat

Scientific Name: Rousettus aegyptiacus

Other Name: Sometimes mistakenly called the “Flying Fox”

IUCN Red list Threat Status: Least concern

Description

The Egyptian Fruit Bat is a smaller type of bat, length of about six inches. Large wing span of about two feet. Weight less than half a pound. The ears are long and pointed. Light brown color on the body. Darker brown on the wings, eyes are large and dark. They have a very long tongue that stays coiled up around the rib cage when they aren’t feeding. The snout area of these bats looks very similar to that of a canine. They have soft fur.

Habitat and Ecology

This species is found in arid to moist tropical and subtropical biomes and has broad habitat tolerance, so long as abundant food and appropriate roosting sites are available. Feeds on soft fruits including Date, carob, mulberry, fig, apricot, peach and apple), flowers**.** Occasionally takes leaves and was observed feeding on flying insects. Often on nectars as well.

Behavior

Egyptian fruit bats are believed to be the most vocal of all bat species. During the day they will spend time grooming and sleeping. Roost in caves and deep in the forest areas where it is dark. They can create very large colonies with often more than 1,000 members. They will stay very close to each other for safety and for warmth. They sleep upside down with their wings folded in across them.

Distribution

Across sub-Saharan Africa and North Africa. Also ranges through the Middle-East up to Turkey, South-West Asia to Iran, Pakistan, Cyprus

Threats

Primarily hunted for food in some cave systems in Africa. The species is considered as a pest by fruit farmers. Consequently cave roosts have been fumigated and destroyed, resulting in incidental killing of many insectivorous bats.

PPT 144-145: Indian Vulture

Scientific Name: Gyps indicus

Synonyms: Indian Griffon, Long-billed Griffon, Long-billed Vulture, Painted Vulture

IUCN Red list Threat Status: Critically Endangered

Description

Medium sized bulky animal. Its body and covert feathers are pale, while quills are darker. Its wings are broad and its tail feathers short.Its head and neck are almost bald. Its bill is pale yellow and long. Usually 80–103 cm long. Wing span of 1.96 to 2.38 m (6.4 to 7.8 ft). Weighs 5.5–6.3 kg (12–14 lb). Large white neck-ruff

Habitat and Ecology

It is found in cities, towns and villages near cultivated areas, and in open and wooded areas. This species feeds almost entirely on carrion. It nests almost exclusively in colonies on cliffs and ruins. Where cliffs are absent, it has been reported nesting in trees. Vultures also play a key role in the wider landscape as providers of ecosystem services.

Distribution

Native: Pakistan and India

Vagrant: Nepal

Threats

These vultures were being found dead and dying in Pakistan and throughout India. The anti-inflammatory drug diclofenac has been identified as the cause of mortality. Vultures are exposed to diclofenac and other NSAIDs through scavenging on the carcasses of largely cattle and buffalo that have been treated with the drugs prior to death and left for scavengers to consume. Hence likely contributory factors are

- Poisoning
- Pesticide use
- Conversion and disturbance of forested habitats within its range.

Conservation action

- Included in Appendix II of CITES
- SAVE (Saving Asia's Vultures from Extinction) has developed the concept of Vulture Safe Zones
    - Areas (with a minimum of 100 km radius, equating to 30,000 km2) around important vulture breeding colonies,
- Education and advocacy efforts are focused on eliminating the use of diclofenac and other vulture-toxic drugs
- Satellite tagging has been employed on Asian Gyps vultures to improve understanding of their movements and range use.
    - To aid the development of conservation strategies for the genus

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Topic: IUCN/SSC Guidelines for Reintroduction of Species

PPT146: Concept

Conservation Translocation

- The deliberate movement of organisms from one site for “release” in another.
    - Release is the act of placing organisms into conditions that differ significantly from those experienced by these organisms in their natural habitats.
    - The differences are Sex ratio, Group size, Breeding system, Environmental conditions
- Translocation is the human-mediated movement of living organisms from one area, with release in another.
    - Moving living organisms from the wild or from captive origins.
- Translocations can be
    - Accidental
    - Intentional
- Intentional translocations can address a variety of motivations, including
    - Reducing population size
    - For welfare
    - Political interests
    - Commercial or recreational interests
    - To achieve conservation objectives

- Translocation must be intended to yield a measurable conservation benefit at the levels of a
    - Population
    - Species
    - Ecosystem

- It not only provide benefit to translocated individuals.
- Conservation translocations can entail releases either within or outside the species’ indigenous range

Population Restoration

Any conservation translocation to within indigenous range

- It comprises two activities
- Reinforcement
- Reintroduction

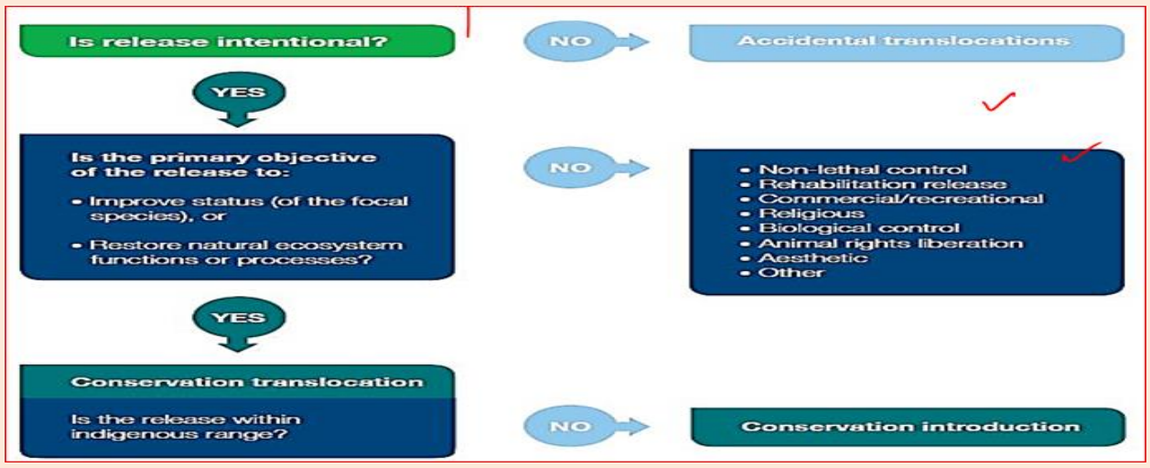
Reinforcement

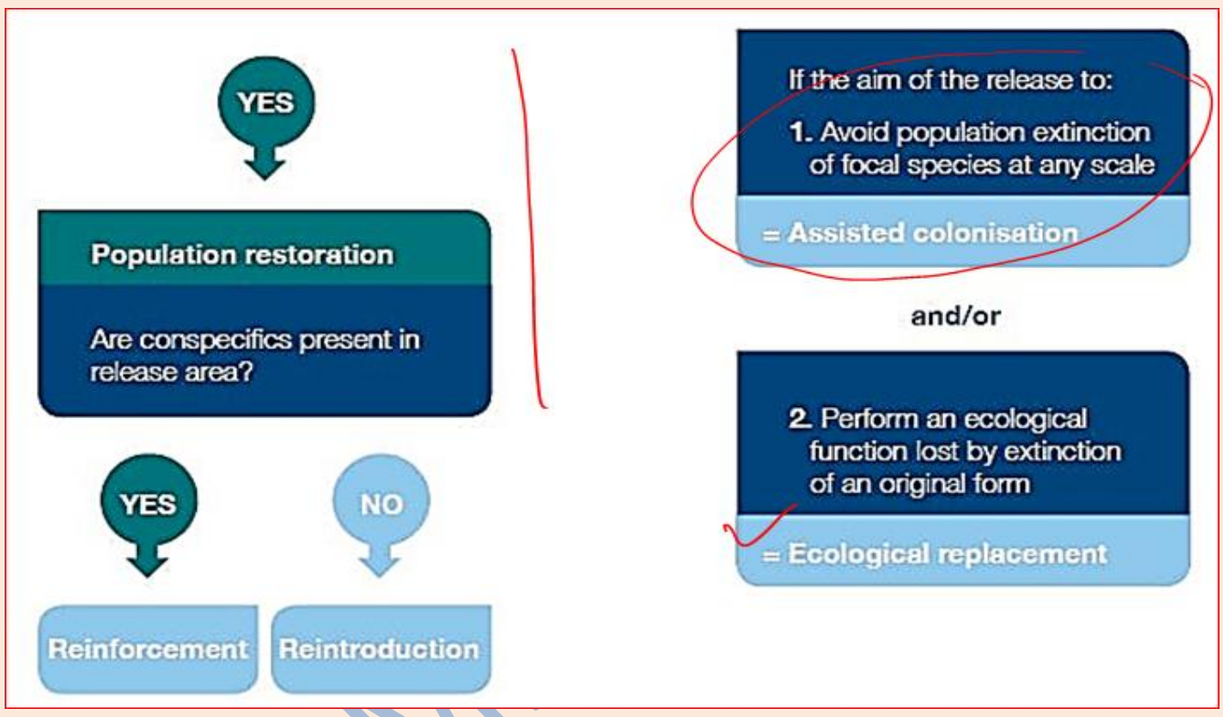
- The intentional movement and release of an organism into an existing population of conspecifics.
- Reinforcement aims to enhance the population viability.
- Population viability can be enhanced by increasing
    - Population size
    - Genetic diversity
    - Representation of specific demographic groups or

Reintroduction

The intentional movement and release of an organism inside its indigenous range from which it has disappeared. It aims to re-establish a viable population of the focal species within its indigenous range.

PPT-147: Species: Translocation Spectrum





PPT-148: Multidisciplinary Approach

Conservation Introduction

The intentional movement and release of an organism outside its indigenous range. Two types of conservation introduction are recognized:

- Assisted colonization
- Ecological replacement

Assisted Colonization

The intentional movement and release of an organism outside its indigenous range

- To avoid extinction of populations of the focal species.

This is carried out primarily where protection from current or likely future threats in current range is deemed less feasible than at alternative sites.

Ecological Replacement

The intentional movement and release of an organism outside its indigenous range

- To perform a specific ecological function.

This is used to re-establish an ecological function lost through extinction. Often involve the most suitable existing sub-species, or a close relative of the extinct species within the same genus

PPT-149: Pre-Project Activities

Feasibility assessment

It should cover the full range of relevant factors

- Biological
- Non-Biological

The primary focus of translocation planning will be the desired performance of the focal species.

Performance of the species can be noted in terms

- Population
- Behaviour
- Ecological roles after translocation

Basic knowledge

Necessary knowledge of any translocation candidate species should include its

- Biotic and abiotic habitat needs even for all life stages
- Basic biology
- Interspecific relationships
- Critical dependencies
- The climate at destination site should be suitable for the foreseeable future.
- Maintenances of animal welfare and should comply with the legislation, regulations and policies in both the source and release areas.
- Every effort should be made to reduce stress or suffering.
- Disease and parasite considerations
    - To maximise the health of translocating organisms
    - To minimize the risk of introducing a new pathogen to the destination area
- Social aspects
    - Proposal should be developed within national and regional conservation infrastructure.
    - Recognizing the mandate of existing agencies, legal and policy frameworks, national biodiversity action plans or existing species recovery plans.
    - Human communities in or around a release area will have legitimate interests in any translocation.

PPT-150: Release and Implementation

Selecting release sites and areas

A release site should:

- Meet all practical needs for effective release with least stress for the released organisms
- Enable release organisms to exploit the surrounding release area quickly
- Be suitable for media and public awareness needs, and any community involvement.
- Meet all the species' biotic and abiotic requirements
- Be appropriate habitat for the life stage released and all life stages of the species
- Be adequate for all seasonal habitat needs
- Be large enough to meet the required conservation benefit

- Have adequate connectivity to suitable habitat if that habitat is fragmented

Release strategy

- The life stage and season of release should be optimized
    - Considering whether dispersal after release is to be encouraged or discouraged
- Translocation success increases with the numbers of individuals released.
    - Which is often enhanced through multiple release events across more than one year
- But this needs to be balanced against impacts on source populations
- Releases, either simultaneously or sequentially, at multiple sites may serve to spread out the released organisms, with several potential benefits
    - Minimising stress during capture
    - Handling
    - Transport
- Animals may be held for some period at the release site to allow them to accustom to local conditions or enhance social group cohesion.

PPT-151: Post Release Activities

Estimation of reproductive success

It involves Quantifying numbers of offspring produced. This requires field surveys

- To identify reproductive individuals
- Their breeding locations
- The fate of their offspring, especially their survival to reproductive age

Alternatively, it may be adequate to estimate recruitment through the number of new individuals entering the population per individual currently present.

Behavioural monitoring

Behaviours can yield insights into the adjustment of translocated animals to the destination area include

- Activity and movement patterns
- Foraging behaviour
- Diet selection
- Social organisation
- Breeding season and success

Ecological monitoring

This should be undertaken to

Record the ecological changes associated with the translocation. It contribute towards the general knowledge basis for translocation feasibility and design

Health and mortality monitoring

This type of monitoring can assess whether there are unacceptably high levels of disease/adverse welfare/mortality. This will have an impact on the success of the translocated population. May present a threat to any neighbouring populations. Identifying the causes of death accurately and precisely can be critical in assessing translocation progress

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Topic: Wild Animals of Pakistan

PPT 152-153: Leopard Cat

Scientific Name: Prionailurus bengalensis

IUCN Red list Threat Status: Least concern

Description

The leopard cat looks like a miniature, long-legged and more slender version of a leopard. Body markings are like leopard; head with stripes.

Its fur varies highly in colour and markings according to the region. Generally spotted body fur coat

- **In the tropics** Fur is yellowish-brown with white underparts
- **In the northern** part of the species' range Greyish brown thick fur and are also larger and heavier than the ones in the south.

The size and shape of the black markings covering the body and limbs are also highly variable. The spots sometimes form lines along the neck and back. The irises are deep, golden brown to grey. Males are larger than females

- Body length 54-60 cm
- Weight 3-4 kg.
- Longevity: up to 13 years
- Litter size:2-3 cubs

Habitat and Ecology

Leopard Cats can occur in a wide variety of habitats. Tropical rainforest, Temperate coniferous forest, Shrub forest and successional grasslands. The northern boundary of its range is limited by snow cover. Leopard Cat does not occur in deep snow. It is not found in the cold steppe grasslands, and generally does not occur in arid, treeless areas. The Leopard Cat is predominantly nocturnal and crepuscular. Some diurnal activity has been recorded.

Distribution

The leopard cat occurs throughout most of India, West into Pakistan and Afghanistan. Its range extends into the Himalayan foothills across most of China. North to the Korean peninsula and into the Russian Far East. It is found in most of Southeast Asia: Thailand, Vietnam and China. On the islands of Sumatra, Java, Borneo and Taiwan. On small islands off South Korea. The leopard cat is the only wild cat species which is native to Japan and the Philippines.

Threats

Leopard cat skins are commercially traded internationally for the fur trade, primarily coats. Skins are also used as decorations in some parts of its range. They are occasionally kept as pets. Sometimes taken from the wild. Sometimes from captive breeding. They have been interbred with domestic cats, particularly in the West, to make the popular Bengal breed. Their bones are used in some traditional Asian medicines

Conservation

Leopard Cat populations in Bangladesh, India and Thailand are listed on CITES Appendix I. All other populations are listed on Appendix II.

PPT 154-155: Jungle Cat

Scientific Name: Felis chaus

Syn: Swamp Cat, Reed Cat

IUCN Red list Threat Status: Least concern

Description

Body not spotted. Body length 64-72 cm. Tail about 1/3 of head and body length. Back of ears reddish with conspicuous apical hair tuft. Body color sandy grey.

Habitat:

The Jungle Cat, despite its name, is not strongly associated with the classic rainforest "jungle" habitat rather with wetlands. Especially reed swamps, marsh, and littoral and riparian environments.

Distribution

Most of India, West into Pakistan and Afghanistan, Russian Federation, Sri Lanka, Syrian, Arab Republic, Tajikistan, Thailand.

Feeding

Jungle Cats feed mainly on prey that weighs less than one kilogram. Small mammals, principally rodents with three to five rodent per day. Birds, waterfowl are the mainstay of Jungle Cat diet in the winter. Other prey species are taken more opportunistically, including hares, nutria, lizards, snakes, frogs, insects, and fish. They have been seen to scavenge kills of large predators such as the Asiatic lion.

Threats

The biggest threat to Jungle Cat is habitat loss particularly industrialisation and urbanisation of low intensity agricultural areas. Habitat destruction for agricultural purposes and infrastructure development are also major issues. Some farmers consider the Jungle Cat a pest which takes poultry.

Conservation actins

Listed on Appendix II. The ecology and status of the Jungle Cat is poorly known. More research needs to be undertaken to gain knowledge of current distribution, both in and outside of protected areas.

PPT 156-157: Red Lynx

Lynx Rufus

Bobcat

IUCN Red list Threat Status: Least concern

Discription:

Generally “Lynx” is a wild cat with yellowish-brown fur. Body fur not spotted. Body length 70-76 cm . Tail comparatively long. Back of ears entirely black. Body covered with brick red fur. There is generally an off-white color on the lips, chin, and under parts. Black streaks on the body and dark bars on the forelegs and tail. Bobcats in the desert regions of the southwest have the lightest colored coats. In the northern, forested regions are darkest. Bobcat eyes are yellow with

black pupils. The cat has sharp hearing and vision, and a good sense of smell. It is an excellent climber. The bobcat is crepuscular, and is active mostly during twilight.

Distribution

- Canada
- Mexico
- United States

Habitat

They are adaptable predators inhabiting

- Wooded areas
- Semi-desert
- Urban edge
- Forest edges
- Swampland environment

Like most cats, the bobcat is territorial and most of the time solitary, although there is some overlap in home ranges.

Feeding

The Bobcat hunt anything from insects and small rodents, rabbits and hares, to deer. Prey selection depends on location and habitat, season, and abundance.

Threats

The biggest threat to Bobcat is its fur. Habitat loss is another primary threat to bobcats in all of its range countries. Increasing urbanization results in direct habitat loss although. Bobcats have proven to be fairly adaptive to urbanization. Bobcats adjust to human developed landscapes, indirect effects increase. Vehicle collisions can be a primary source of mortality in urban Bobcat populations. Exposure to common rodenticides in urban landscapes can result in direct mortality (anticoagulant toxicosis). Increased susceptibility to severe notoedric mange resulting in the death of Bobcats. In localized areas Bobcats take domestic livestock and are persecuted as pests.

Conservation actins

Listed on Appendix II. More research needs to be undertaken to gain knowledge of current distribution, both in and outside of protected areas.

PPT-158: Fishing Cat

Scientific Name: Prionailurus viverrinus

IUCN Red list: Threat Status Vulnerable

Discription:

Body fur coat with darker stripes on the shoulder. Roundish or oval-shaped spots on the flanks and sides. Back of ears black with whitish spots. Tail short. Body length 74 cm. Body color is earthy grey.

Habitat

They are inhabiting Wetlands. Typically inhabit swamps and marshy areas. Around reed beds. Tidal creeks. Mangrove forests. They seem less abundant around smaller, fast-moving watercourses.

Feeding

The Fishing Cat is largely nocturnal. It is consuming a variety of prey such as rodents, birds and fish. It has been noted that that each individual eats between 365 and 730 rodents per year

Distribution

Bangladesh, Cambodia, India, Myanmar, Nepal , Pakistan, Sri Lanka, Thailand.

Threats

The Fishing Cat is killed for consumption as part of a cultural practice. The Fishing Cat is killed in retaliation for damaging fishing nets. Opportunistic trading of skins and potentially other parts. Individuals are sometimes seen in the intensive live animal ('pet') trade. The major threat among all is appears to be habitat loss and fragmentation by developmental activities such as urbanization, industrialization, agriculture and aquaculture.

Conservation actins

- Listed on Appendix II
- In Viet Nam Fishing Cat has the highest level of protection under the main species protection law
- Included in appendix I B
- This completely prohibits any exploitation or commercial trade.

PPT-159: Rhesus Monkey

Scientic Name: Macaca mulatta

Macaca (feminine) and macaco (masculine) are the Portuguese words for 'Monkey'

IUCN Red list Threat Status: Least concern

Description

Brown in color. Adult red face. Under parts are lighter brown. Locomotion is quadrupedal. Sexual maturity 4-6 years. Gestation period: 5 and half months. Group size varies from 10-50. Male is larger than female. Diurnal, Terrestrial, Partly arboreal. Quiet tolerant of human disturbance

Habitat

Inhabits mountainous regions of the moist temperate forest and also found in dry temperate forest. Mainly found in northern hill regions of Murree, Swat, Kaghan, Azad Kashmir and Chitral, Malakand and Marghalla hills

Distribution

Southern Asia, Eastern Afghanistan, Bangladesh, Bhutan, Central and southern China, Northern and central India, Myanmar, Nepal, Northern Pakistan, Thailand, Vietnam

Feeding habits:

This species is diurnal and omnivorous. Feeds on Fruits, Seeds, Leaves, Gums, Resin, Bark and Small invertebrates.

PPT 160-161: Brown Bear

Scientific Name: Ursus arctos

IUCN Red list Threat Status: Least concern

Syn; Grizzly Bear

Description:

Large animals, dark in colour, long guard hair over the shoulder, characterized by a distinctive humps on shoulders, long claws on the front paws. Sexual maturity: 4.5 to 7 years of age.Litter size ranges from one to four but two are common. Cubs remain with their mothers for at least two and half years.Female breed every three years.

Feeding habit:

Chiefly vegetarian. Feed mostly on fruits, honey and ants. Occasionally kill sheep and goat.

Distribution

The brown bear ranged across a large portion of North America throughout across North Africa. Presently it occupies North America, Europe and much of northern Asia.

It's native countries are:

Afghanistan, Iran, Canada, Iraq, China, Pakistan, Georgia, Italy, India, France.

Threats

Brown Bears are attracted to areas with available human-related foods. Being large and somewhat aggressive, these bears may threaten life and property (often agricultural products) and may be killed as a consequence. When Brown Bears exist in a large, contiguous population. They are sometimes hunted for sport, killed for control purposes. Brown bears are poached for the commercial trade in gall bladders and paws. In portions of Alaska, the management goal is to reduce bear populations to encourage Moose and Caribou populations to expand for the benefit of hunters. Habitat fragmentation with increasing human populations.

Conservation actins

Conservation actions vary greatly among nations and regions within nations. In Russia, Japan, Canada, Alaska, and parts of eastern and northern Europe). Large populations of this species are legally hunted, and thus managed as a game animal.

PPT-162-163: Black Bear

Scientific Name: Ursus thibetanus

Synonyms: Asiatic Black Bear, Himalayan Black Bear, Moon bear , White-chested bear

IUCN Red list Threat Status: Vulnerable

Discription:

Is a medium size black colored bear, distinct white patch on the chest and white on the chin. Body length 4-6 feet. Sexual maturity 3-4 years. Mainly nocturnal, sleeping in trees or caves during day. They are the most bipedal of all bears, and have been known to walk upright for over a quarter mile.

Distribution:

Southeastern Iran eastward through Afghanistan and Pakistan. Across foothills of Himalayas to Myanmar. All countries in mainland Southeast Asia except Malaysia. Found in Iran, Pakistan, Afghanistan, China, Russia and Korea

Feeding Habits:

Chiefly vegetarian; feed mostly on fruits, honey and ants. Asiatic Black Bears also use regenerating forests, which may have a high production of berries or young bamboo shoots. They also feed in plantations, where they may damage trees by stripping the bark and eating cambium. They feed in cultivated areas, especially corn and oat fields and fruit orchards.

Breeding and Reproduction:

Age of first reproduction is typically 4-5 years old. They normally produce litters of 1 or 2 cubs every other year. Maximum lifespan is over 30 years. But average lifespan is less in the wild.

Threats

Habitat loss due to human settlement. Hunting for skins, paws and especially gall bladders are the main threats to this species.

Bear bile has been an important component of traditional medicine in Eastern Asia for millennia. Used for

- Fever and inflammation
- Detoxifying the liver
- Arresting convulsions
- Improving eyesight
- Dissolving gall stones

In western societies it has been approved as a drug to treat certain liver diseases. Illegal bear bile farming

Conservation actins

Conservation actions vary greatly among nations and regions within nations. The Asiatic Black Bear has been included on CITES Appendix I since 1979. Protection of forested habitats would be an important conservation measure for this species.

- China, Thailand, and Viet Nam have imposed various sorts of logging bans
- Russia banned the felling of Korean Pine, a key bear food source
- Substantial lessening the demand for bear products, and thus reduce hunting and trade.

PPT-164: Chital

Scientific Name: Axis axis

Syn; Spotted deer, Axis deer

IUCN Red list Threat Status: Least concern

Description:

The species is sexually dimorphic. Males are larger than females, and antlers are present only on males. The antlers, three-pronged, are nearly 1 metre (3.3 ft) long and shed annually. The upper parts are golden to rufous, completely covered in white spots. The abdomen, rump,

throat, insides of legs, ears and tail are all white. 76-91 cm high, grazing and gregarious deer, living in herds of 5-30. Weighs up to 95 kg. Prefers open types of forests. It has been recorded in Punjab but has become rare in the recent past. Chital are active throughout the day.

Feeding habit:

Grazers as well as browsers, the chital mainly feed on grasses throughout the year

Distribution

Native

A species of deer that is native in the Indian subcontinent. Bangladesh, Bhutan India, Nepal, Sri Lanka

Introduced

Argentina; Armenia; Australia; Brazil; Croatia; Moldova; Pakistan; Papua New Guinea; Ukraine; United States

Threats

There are presently no major global-level threats to Chital. Chital are hunted for food, sport and a variety of other purposes

PPT-165: Barking Deer

Muntjacs

Muntiacus muntja

Cervus moschatus

Cervus muntjak

IUCN Red list Threat Status: Least concern

It gives calls similar to barking, usually upon sensing a predator. Hence the common name for all muntjacs of "barking deer

Description:

It is a little dainty creature and weighs about 22-25 kg. Coloration varies from deep brown to yellowish with creamy or whitish markings. Only males have antlers. The upper canines of the male are elongated into tusks, which curve strongly outward from the lips. Females also develop small tusks in the upper jaw. Capable of inflicting sever injuries with these tusks, when defending themselves or their fawns. Two bony ridges are present in the front part of the skull.

Feeding habit:

Diet includes grasses, low growing leaves, tender shoots and fruits.

Distribution

Native: Brunei Darussalam; Indonesia; Malaysia; Thailand

Regionally extinct: Singapore

Pakistan: Confined to Himalayan foothills. Commonly found in Margala hills, Swat and Azad Kashmir.

Threats

Generally Muntjac is an important source of bushmeat. Selected body parts and the foetus are also used in traditional medicine. Individuals are usually killed during, or shortly after, their

capture. Foothold snares are commonly used as well as spears and firearms. Dogs are often employed.

PPT-166: Musk Deer

IUCN Red list Threat Status: Endangered

Musk deer can refer to any one, or all seven, of the species that make up Moschus, the only extant genus of the family Moschidae. The musk deer are lacking antlers.

Description

Markedly different from other species of deer. No glands on face and foot. Females have only two mammary glands. 50 cm high and weighs about 11-12 kg. Hind legs are much longer than the fore legs. Ears very long and prominent. Tail is very short and completely hidden in anal hair. Body covered with thick long bristly hair. Color greyish brown with grey spots on the back. Male has downwardly projecting canines about 8 cm in length and are used in fighting. Musk is present in the musk pouch which is present below the skin of the abdomen of male only.

Distribution

In Pakistan it is found in sub alpine zones of Himalayas. At about 2500-4000 m altitude in Chitral, Gilgit, Hazara and Azad Kashmir.

Threats

There is a high trade in Musk deer parts, particularly pods, into China and elsewhere in northeast Asia. Hunted for meat, which is considered a delicacy locally. Trade of musk glands, which has led to a substantial increase in hunting since long. The musk is valued for its cosmetic and pharmaceutical properties. Yield of the musk is only about 25 grams

Conservation actins

This species is listed on CITES Appendix I. The high value of the parts in trade mean that conservation requires effective hand-on anti-poaching activity.

PPT-167: Kashmir Stag

Scientific Name: Cervus canadensis hanglu

Synonym: Hangul

IUCN Red list Threat Status: Critically Endangered

Discription:

Stag is a male deer, especially a male red deer after its fifth year. Morphologically almost similar to that of other deers. Each antler consists of five tines. This deer lives in groups of 2 to 18 individuals in dense riverine forests and high valleys, and mountains of the Kashmir valley and in Himachal Pradesh.

Distribution

Does not occur permanently in Pakistan. Reported to exist in forests of Neelam valley, Azad Kashmir, etc. Fairly distributed in occupied Kashmir

Threats

The species is illegally hunted. The illegal hunting is one of the main reasons for the species' decline in the past and present.

PPT 168-170 : Wild Sheeps

Common Description

The true wild sheep are included in the genus Ovis. Horns heavily wrinkled. Sub orbital glands. Pedal glands in both fore and hind limbs. Male sheep never develop beard. Gregarious and the biggest herds consist of associations of female with their followers and immature males. During the day they rest, usually under an overhanging bush or rock where they are well concealed. Their sight, hearing and sense of smell are all acutely developed. They are excessively wary, depending upon early detection of approaching danger and flight for their survival.

Gestation Period: 150-180 days**.**

Young per Birth: Single or occasional twin lambs being born, Mid-April to early May in Punjab. Often as early as late March in Kirthar Range in Sind.

Sexual Maturity: At 4-5 years.

Life Span: 10-11 years.

Feeding

Their preferred food is grasses. During fodder scarcity, Browse the leaves of Acacia modesta. Sometimes pink mucilaginous fruits. Feeding activity is confined to the early morning and evening in the summer months, often commencing well before dawn.

Urial & Sub Species

Prominent species in Pakistan

- Ovis ammon (Marcopolo sheep)
- Ovis orientalis (Urial)

Ovis orientalis

Urial is a wild sheep with long legs and relatively small horns, native to central Asia. Urial is represented by three sub species in Pakistan.

Ovis orientalis vignei Ladakh Urial or Shapu

Fur tends to be more greyish in winter and less red. The chest ruff is comparatively short with black hairs predominating. The horns turn markedly inwards at their tips

Distribution:

Found in Chitral & Northern areas. On mountains upto 3000 meters elevation

Status: Endangered

Ovis orientalis blandfordi

Afghan or Baluchistan Urial. Luxuriantly developed neck ruff. The body fur is reddish. The rams have horns which often develop more than a complete arc. Tips of horn bending slightly outwards

Distribution:

Found in Sindh, Baluchistan and Southern hilly regions of KPK.

Status: Endangered

Ovis orientalis punjabiensis

Locally called as Punjabi Dunba. Tend to be smaller and stokier in build compared with the Afghan sub-species. Mature rams develop a conspicuous saddle mark in the form of a vertical band of mixed black and white hairs. Horns are more massive at their base than the Afghan population. Horns never curve round in more than a complete arc.

Distribution:

Occurs in between the Indus and Jhelum rivers at elevations of 250 -1,500 m

- Salt range
- Kala Chitta
- Jhelum hills.

Status: Endangered

Threat:

The status of Punjab urial is susceptible to physical and emotional injury.

Reasons for Decline in numbers

- Poaching
- The capture of newborn lambs that are kept as pets
- Fragmentation of home ranges
- Competition with domestic livestock

Habitat disturbance and destruction associated with increasing agriculture, forestry and mining. The construction of the M-2 Motorway between Islamabad and Lahore created a substantial barrier to seasonal migrations and to dispersal.

PPT 171-176: Wild Goats

Common Description

IUCNstatus: “Vulnerable”

The wild goat inhabits the Middle East from Afghanistan through Pakistan, Iran and Turkey. Their coat comes in a variety of creams, grays and browns. Their horns are medium-sized and curved backward. They are stockily built ruminants which are generally adapted to climbing in

mountainous terrain Both sexes are with horn. Facial glands are absent. Chin of males is bearded. Pit glands in fore legs. Bony cores of horns. Herds may contain as many as 20 goats in the wild. In herds, there is a dominant female throughout the year, until mating season. At this time a male dominates the herd. Many times, males only live with a few other males or by themselves, year-round.

Feeding

They prefer rocky plateaus and terrain where they feed on grasses, shrubs and herbaceous plants. Goats typically spend their days grazing on grasses within their home range, which is an area of about 14 square miles (23 square kilometers).

Prominent genera of goats in Pakistan

- Naemorhedus
- Hemitragus
- Pseudois
- Capra

• Grey Goral

Scientific Name: Naemorhedus goral

Description

This genus is represented by only one species in Pakistan. It is a small sized animal whose face is deer like but other characteristics are those of wild goats. It attains a height of 60-70 cm at shoulder. Weighs about 25-28 kg. General body coloration is dark greyish blue. Older buck tends to be darker. The tail is longer than other the wild goats. There is a conspicuous black mark in the front of the fore legs. In both males and females, the horns are slender, black, conical and curving backwards at the tip. Males without beard. Ears broad and bell shaped. Females are with four mammary glands

Distribution

In Pakistan, it is found in Himalayan foothills. At about 800-1500 m elevation Margalla, Swat, Hazara, Malakand and Parts of Neelum Valley (Azad Kashmir).

1. Himalayan tahr

The word "tahr" comes from the Nepali word thār. The genus “Hemitragus” comes from the Greek words . Hemi meaning "half" and trágos meaning "goat”.

Distribution:

Native: China; India; Nepal

Introduced: New Zealand; South Africa

Pakistan: Restricted to Pir Punjal Range in Azad Kashmir.

2. Pseudois nayaur

Description

Commonly called as Blue sheep or Bharal. It shows characteristics intermediate between sheep and goats. It has smooth cylindrical horns (not wrinkled as found in true wild sheep). Sub orbital gland is absent. Adult males have a salty blue coat in winters and are beardless. In general appearance and size, it looks like the famous wild sheep “Shapu”.

Distribution:

Native: Bhutan; China; India; Myanmar; Nepal; Pakistan

In Pakistan: Hunza, Karakoram Range in Baltistan.

Capra: Species & Sub-species

Capra:

Description:

Body length 52 inches, 4.4 feet have strong limbs terminating in broad hooves. Female and young male yellow brown to reddish grey. Male are beautiful with long horn, white hair in old age. Male have short beard, Female black beards.

Gestation period: 150-155 days, 5 months. Twins are common

Sexual maturity: About 3 years

Gregarious from large herds. Older male generally keep together. Wild goat wonderful has sense of balance and can make standing leap upwards.

Food: The leaves and bushes small shrubs and herbs.

Distribution:

3. Live at sea level. Live remoter cliffs inhabit mountain 1000ft.
4. Found in mountain ranges of southern Balochistan.
    - From Mekran coastal range, at Pasni to Sindh kohistan and kirthar range in the east.

- Hunza
- Northern chitral

Game reserve for wild goat

- Hingol range in central Mekran
- Biggest population in kirthar national park in southern Sindh,about 4000 organisms.

1. Capra hircus

Females are beardless but carry backward curving horns. Measure upto 15 cm and bear fine annulations towards their base. The younger males and females show a characteristic shape pattern with a dark stripe running from the corner of eye to the muzzle. Mature males are spectacularly beautiful and may have horns over one meter in length. In adults the hair coat is of reddish buff in color. The belly and the outside of lower limbs, beard and fore part of face varies from black to chestnut brown in color. The shoulder height. They are capable of surviving in very arid desert conditions. They inhabit mountain crests upto 3300 m.

- In males is 85 to 95 cm. In females 55 to 60 cm.
- The weight of adult Males up to 120 kg, Females 50 to 55 kg

2. Capra Ibex

Description:

Females and young males have a reddish brown tan or a golden color in summer with a greyish brown appearance in winters. Older males have rich brown chocolate coloration, they usually live above tree line from about 3660m to over 6000m.

Distribution:

It is fairly widespread in Baltistan, Dosai, Gilgit, Chitral.

3. Capra falconeri

Description:

The Capra falconeri is commonly called as Markhor. No wild goats excel Markhor in climbing in precipitous slopes. They are sensitive to cold and descend to comparatively lower levels in the winters

They have five distinct sub species in Pakistan:

1. Capra falconeri falconeri (Astor Markhor).
2. Capra falconeri cashmiriensis (Kashmir Markhor).
3. Capra falconeri megaceros (Kabul Markhor).
4. Capra falconeri jerdoni (Suleiman Markhor).
5. Capra falconeri chiltaniensis (Chiltan Markhor).

Distribution:

- Capra falconeri falconeri is confined to Gilgit.
- Capra falconeri cashmiriensis is found in Chitral; few herds also occur in Swat and Azad Kashmir.
- Capra falconeri megaceros is found in Malakand, Swat and Chitral.
- Capra falconeri jerdoni occurs in mountain ranges immediately north and east of Quetta, Baluchistan.
- Capra falconeri chiltaniensis is restricted to three hill ranges namely Chiltan, Koh Murdar and Koh Maran near Quetta.

PPT 177-180: Antelopes

General Description

An antelope is a member of a number of even-toed ungulate species indigenous to various regions in Africa and Eurasia. Distinct hooved mammals of the family Bovidae. Possess unbranched horns that are never shed. No incisors or canines in the upper jaws. Old World (Africa, Europe, and Asia) grazers and browsers. In Pakistan, there are three species of antelopes: Nilgai (Boselaphus tragocamelus), Chinkara (Gazella gazella), Black Buck(Antelope Cervicapra.

1. Nilgai

Scientific Name: Boselaphus tragocamelus

Description:

Nilgai means blue cow. The male has blueish, grey colour. Females are yellowish brown in colour. It is a sturdy animal with stout legs and long sloping horse like neck. Both sexes have a course mane of long and narrow, almost horse like Nose black and nabbed. There is a small pit gland below the eye. The tail is long bearing tuft of coarse black hair on the middle forepart of the neck. Both sexes have conspicuous while stocking marks above the fetlocks and hooves. The male has black cow like horns, curving slightly backwards and outwards, while the female has no horns. Adult males are heavier than the females. They feed in early morning and late evening Grazing grass as well as browsing on trees. They also favoring succulent fruits and leaves. Agricultural crops are raided by the animals and sometimes they become a problem. Breeding populations exist only in changa manga and Lal suhanra plantations. Individuals along the Pak-India border intermigrates. In view of the declining population, they are not allowed to be hunted. Gestation: 247 days. Usually twins are born rarely a single.

Longevity

- **In wild is 12-15 years**
- **In captivity is 18 years.**

The young spend most of the 10 days lying down and standing up only to Suckle.

Distribution:

Native: India; Nepal; Pakistan

Regionally extinct: Bangladesh

Introduced: Mexico; United States. The tropical thorn forest. Uncultivated semi deserts of Pakistan

Mainly occurring around the Indian border: In the north eastern corner of the Punjab, and further south around fort Abbas in cholistan. Small populations still exist in changa manga (kasur) and Lal suhanra (Bahawalpur) irrigated forest plantations. Some individuals are also reported to stray in thraparkar areas in Sindh from across the indo pak border.

2. Chinkara

Scientific Name: Gazella gazella

Description:

The body is covered with long coarse reddish grey hair having a blue grey underwood in winter coat. The belly and throat hair are pure white. The fur is shorter showing less admixture of white hair in the summer coat. The legs are very long and slender. With dark brown tufts of hair on the knees (carpus) of the forelegs. The hooves are black, sharply pointed. The muzzle is fully covered with whitish hair up to the nostrils which have somewhat been elongated. The iris in the comparatively large eyes is almost black. Chinkara are semi nocturnal starting to forage mainly in cultivated crops before sunset. They retreat forage by the morning deep in the desert. They are mainly browsers utilizing the foliage and fruits of natural shrubs. They even take trees, and in drought periods, even the green twigs. Grasses form a major part of their food during the monsoon. Tendency to keep to small groups of 2-3 individuals. Females nearly always bearing horns comprising straight smooth spikes. The average horn length of males is 10 -12 inch measured over the curve. The young are susceptible to predation from jackals and wolves and possible caracal cats. The adults probably have no serious enemies expect man.

Gestation:

Five and half months single is born. Twins are reported occasionally. The female mature at the age of 12 months.

Longevity

in wild is not known, in captivity they live for 12-13 years.

Distribution: Found in Western and Central India, Pakistan, Thar desert, Afghanistan, Iran.

3. Black Buck

Scientific Name: Antelope cervicapra

Description:

Exhibits pronounced sexual dimorphism. The black buck get their name from the black pelage of males attained on maturity at three years of age. Both sexes have white under parts including the insides of the legs and lower chest. The horns are found only in males. Twisted in a tight spiral with up to fine turns. Appearing before their pronounced colour change. Gestation period 5-6 months, young per birth.

Food: Leaves, buds , grasses, field, fruits, grain crops.

Life span: 10-12 years.

Fact

Today, extensive hunting and habitat destruction have restricted black buck to only small, isolated populations in their former native habitat.

Distribution:

Found in desert and semi desert areas of Pakistan, East of Indus, Cholistan thar

Captive population:

- Kirther and Lal Suhanra national park.
- Mir of Khairpur Mehrano Research.
- Khanpur, Ghotki.
- New Jator, Nawab Shah.

PPT-181: Foxes

Description:

Foxes are small-to-medium-sized. Omnivorous mammals belonging to several genera of the family Canidae. They are smaller and lighter in built. Tail is more bushy. Pinnae is larger, erect and triangular. Keen sense of smell. Hearing and sight; can adapt to diverse climate and habitat. Feeds on carrion, mice, rabbits, birds and fruits of wild plants. Lives singly and non-social in it's hunting habits. Cubs are born with eyes closed and are attended by both parents for about four to five weeks.

The two common species found in Pakistan

- Red Fox (Vulpis vulpis)
- Indian Fox (Vulpis benghalensis**)**

Red Fox Distribution in Pakistan

- Baluchistan
- KP
- Cholistan
- Tharparkar region.

Indian Fox Distribution in Pakistan

- Southern Sindh
- Northeast Punjab

PPT-182: Hyaenas

Description:

Hyaenas are large sized dog like carnivores with big head. Massive cheek teeth. Carnassials well developed. Long developed fore legs. Each foot has four toes with non retractile claws. The most conspicuous feature is a crest like mane that extends from head to the root of tail. Body fur with yellowish fawn ground and in distinct broad vertical black stripes with close set black stripes on legs. Voice is almost human like, it can also imitate the cries of other animals by which means dogs, calfs and sheep are deceived. They are scavengers feeding on carrion but will also attack on live cattle.

Distribution:

The only species found in Pakistan is Hyaena hyaena. Distributed in Hilly tracks of Pakistan. More common in Baluchistan and Sindh

PPT-183: Wild Dogs

Description:

These are members of family Canidae, order Carnivora. Dogs are predators and scavengers. The dog has powerful muscles, fused wrist bones, teeth for catching and tearing. Characterized by having five digits on fore limbs of which the first one is vestigial. Hind limbs have four digits. Claws are non retractile. External pinnae pointed. Tail long and bushy. No stripes or spots found on body. The teeth are proportionately smaller than those of wolves. The skin of domestic dogs tends to be thicker than that of wolves. The paws of a dog are half the size of those of a wolf. Tails tend to curl upwards, another trait not found in wolves. The two familiar species found in Pakistan

- Wolf (Canis lupus)
- Jackal (Canis aureus)

PPT-184: Wolves

The two familiar species found in Pakistan

- Wolf (Canis lupus)
- Jackal (Canis aureus)

1. **Gray wolf Canis lupus**

Syn: The timber wolf. Western wolf

Description

A canine native to the wilderness and remote areas of Eurasia and North America. It is the largest extant member of its family. Weight in Males 43–45 kg. In Females 36–38.5 kg. The wolf body's usually covered with thick greyish or grizzled color hair. Hunting large prey, its more gregarious nature. Wolves typically locate their prey by scent.

Distribution

The wolf is common in Cholistan (Punjab) and Tharparkar Dist, (Sindh).

2. **Canis aureus (**Golden jackal)

Description

This jackal is smaller and possesses shorter legs. A shorter tail. Tip of bushy tail is black. Less-prominent forehead. Narrower and more pointed muzzle. The jackal has fox like narrow head and pointed muzzle. Other traits are like dogs. The hair coat is grizzled tawny buff color.

Distribution

The jackals are found throughout Pakistan in mountainous areas, forests, plantations and riverine thickets.

PPT-185: Civets

Description:

Civets are related to cats but are distinguished by their longer head and jaws. Relatively short legs and bushy tail. Civets are good climbers, nocturnal and omnivorous. They secrete from their anal glands, a greasy substance called 'civet' which is used in making perfumes. Used for making territory. They live upon small mammals, birds, lizards and feed on fruits as well.

The two species of civets found in Pakistan are:

- Indian civet (Viverricula indica)

Distribution

Indian civet is commonly found throughout riverine jungles and sand dune deserts of Punjab and Sindh.

- Palm civet (Paradoxurus hermaphroditus)

Distribution

The Palm Civet is a mountain species. Frequently occurs in Chitral, Swat, Dir, Azad Kashmir and Muree Hills.

PPT-186: Martens

Description:

These are small carnivorous animals that live in wild rocky regions and are adapted to an arboreal life. Ears are large, pointed and set wide apart. Tail is bushy and thick.

Two species common to Pakistan are

- Stone marten (Martes foina)

The stone marten has a dense fur coat of rich liver chestnut hue

Distribution

Stone martens are found throughout mountain ranges of Baluchistan and Northern areas.

- Yellow throated marten (Martes flavigula)

The yellow throated marten is considerably larger in size than the stone marten. The whole of it's chest, throat and lower jaw are yellowish in color. General body color is silvery, tail is longer; rhinarium is naked and black.

Distribution

Yellow throated marten is found in Chitral, Azad Kashmir and Margala hills

PPT-187: Badgers

Scientific Name: Mellivora capensis

Description:

It is primarily a carnivorous species. Ratel or Honey badger is thickest ugly animal of about 75 cm in length. It's coarse body fur is sharply divided into two contrasting colors. The top half of the head, neck and back is silvery grey. While the limbs, belly, lower cheeks and muzzles are dark black. Ear pinnae are very much reduced. Fore limbs are powerful and armed with strong claws. There is a sac like gland around the anus, from which an offensive secretion can be omitted.

Distribution

It is found throughout the southern parts of Baluchistan and Sindh.

PPT-188: Otters

Description:

Otters are aquatic carnivores. Broad and depressed head. Naked black rhinarium. Short webbed legs. Body covered with dense oily greyish brown fur. Tail thick and somewhat flattened. Ear pinnae very small. Mainly nocturnal, in hunting activity. Shelter by day in burrows in the banks of rivers or ponds and Food mainly consists of fish, frogs and molluscs.

Two species are present in Pakistan:

- The common or Himalayan otter (Lutra lutra)

Distribution: The Himalayan otter is found in all Himalayan river systems.

- Smooth coated or Indian Otter (Lutra perspicilata)

Distribution: Indian otter is found throughout the lower Indus riverine system of Punjab and Sindh.

PPT 189-190: Common Peafowl

Fact file:

Peafowl is the term given to 2 species of bird.

- The Indian Peafowl (Pavo cristatus)
- The Green Peafowl (Pavo muticus)

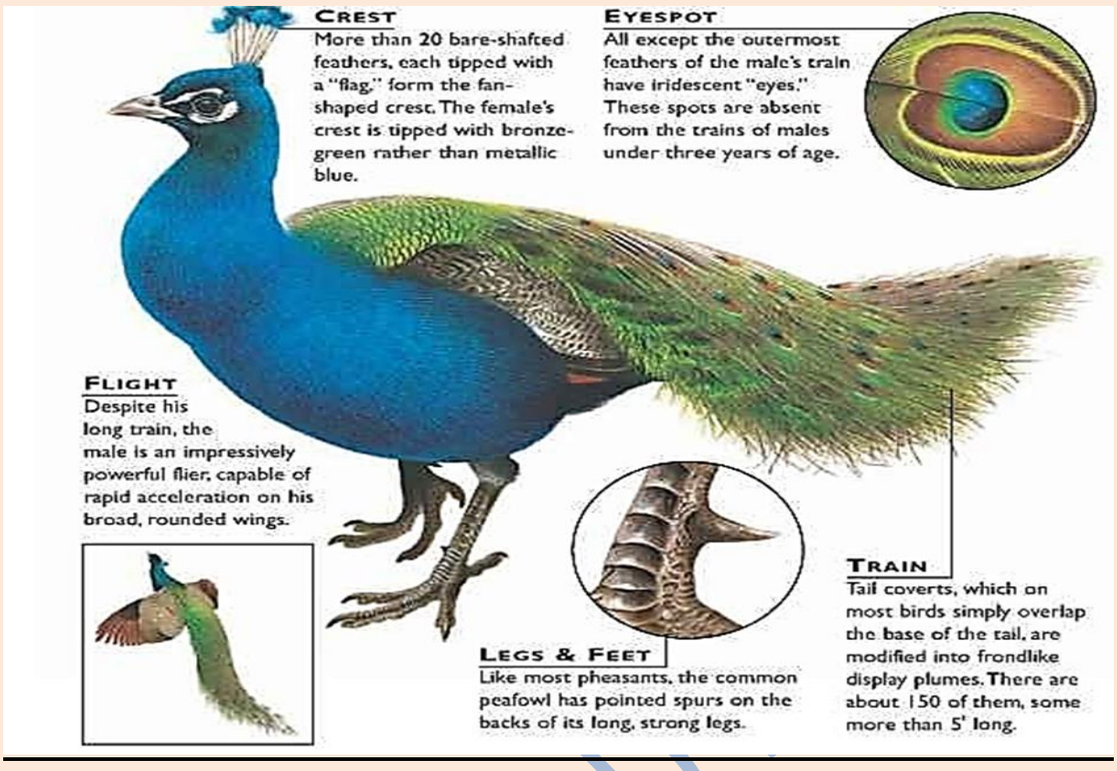
Males are known as 'Peacocks' which are members of the pheasant family. Females as 'Peahens'. The Peacock is the National bird of India.

Description:

Indian blue peafowl are known best for their exquisite train and plumage. The peafowl is considered one of the largest flying birds. If the length of the tail and wing span is included, They weigh in between 2.7-6 kg. Wingspan of 1.4-1.6 m. They vary widely in length from 0.86-2.12 m. This species has long, strong, grayish-brown legs equipped for running away into brush for safety. Both sexes are equipped with spurs that are around 2.5 cm long. Males will use them during the breeding season to ward off other competing males. Females are brown, grey, and cream-colored. Chicks are usually a light yellow to brown color. Pea fowl neck and breast is a Bright blue, golden feathers line their sides and backs. Both male and female Peafowl have crests on top of their heads.

- Polygynous

- Familiar displays
- Clutch size: 3-6 eggs.
- Incubation is by female only last for 28-30 days



The males have a long train ("tail") about 1.2 m in length from June to December. The train is discarded in January. Train grown again at a rapid pace when breeding season approaches. Trains are an iridescent arrangement of multiple colors featuring ocelli (eye-spots). When displayed, the male's train spreads out in a wide fan Showing off gold, brown, green, and black feathers. Around 30 to 40 of the ocelli around the outer edges of the fan are not round but v-shaped. This complicated pattern is thought to be an advantage in mating.

There are three variations in the Indian blue peafowl. (when bred with another white feathered peafowl, all their offspring will be white feathered peafowl as well)

The white feathered peafowl

Having completely white feathers from the top of its head to the end of its train Ocelli barely visible. These are not albinos because they are true breeders and have brown eyes.

Pied

Random white feathers appear in the plumage. This results from an incomplete dominant gene

Black-winged peafowl

Dark feathers with blue and green tips. In addition, Pavo cristatus can hybridize with the green peafowl, Pavo muticus. For the past two decades, a new mutation in the plumage has been discovered almost every year.

Distribution

Native: Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka

Introduced: Australia, Bahamas, New Zealand, United States.

Distribution in Pakistan:

- Tharparkar district, bordering India and sukhar
- Small areas in Azad Kashmir
- Changa Manga

IUCN status: Least Concern

Feeding habit

Omnivorous:

- Grain and green crops to insects
- Small reptiles
- Mammals
- Berries
- Termite
- Grasshopper
- Ants and beetles.
- Roots in high fairly open trees in large number.

PPT-191-192: Cheer pheasant

Facts:

Pheasant is a large long-tailed game bird. The male of which typically has very showy plumage.

Description:

These birds lack the color and brilliance of most pheasants, Buffy gray plumage Long gray crests. Bill is pale and horny. Bare skin round eye brighy red. Its long tail has 18 feathers. The central tail feathers are much longer and the colour is mainly gray and brown. Top of head and crest blackish-brow, edges paler and tipped with grey. The female is slightly smaller in overall size. Sexual dimorphism is slight. Birds have many vocalizations including a very distinctive crowing. Incubation is performed by female Clutch size9-10 eggs.

Distribution

In the highlands and scrublands of the Himalayas region of

Native:India, Nepal, Pakistan

Distribution in Pakistan

Formerly abundant throughout Siran Kaghan valley Marghalla hills, Swat and Kohistan districts. At present restricted to several small pockets of Kashmir. 50-60 pairs of breeding captive birds are well kept at Dhodial (Manshera)in KPK

Feeding habit:

Major food:

- **Roots**
- **Tubers**
- **Seeds**
- **Berries**
- **Various insects**

IUCN status: Vulnerbale. It is listed on Appendix I of CITES.

PPT-193: Koklass

Scientific Name: Pucrasia macrolopha

Facts:

The words ko.klass has been onomatopœically derived from the bird's territorial call. This bird is having a long central and two lateral crests on the head. Called also pucras.

Description:

Medium sized pheasants, Sexes are moderately dimorphic, Male have a well developed occipital crests, Female have shorter crest.

Monogamous

Territoriality is well developed Clutch size: 5-7 eggs

Two subspecies are found in Pakistan:

(i) Western Koklass

(ii) Kashmir Koklass

Distribution

Native: Afghanistan**,** China**,** India, Nepal**,** Pakistan

IUCN status: Least concern

Distribution

Afghanistan, Swat, Kohistan. Found 6000-11000 ft (Ayubia National Park).

Feeding habit:

All kinds of grains, Grass seeds, Berries, Buds, Insects and Worms

PPT 194-195: Monal Pheasant

Facts:

A monal is a bird of the pheasant family,Phasianidae. There are three species and several subspecies. Himalayan monal is National bird of Nepal and State bird of Uttarakhand, India

- Sclater's monal (Crestless monal)
- Chinese monal
- Himaliyan monal

1. Himalayan Monal

Description:

It is a relatively large-sized pheasant. Sexes are highly dimorphic. The adult male is having. Multicoloured plumage throughout. A long, metallic green crest. Coppery feathers on the back and neck. The eyes ringed with blue and the neck reddish brown. Curved beak which together enable it to dig into the hard soil of the mountains to uncover seeds etc. The tail feathers are uniformly rufous, becoming darker towards the tips. Weighs upto 2380 gms. A prominent white rump that is most visible when the bird is in flight. The female, as in other pheasants, is dull in colour. Weighs upto 2150 gms. Lower tail coverts are white. Barred with black and red. Having a prominent white patch on the throat. A white strip on the tail.

The first-year male and the juvenile resemble the female But the first-year male is larger and the juvenile is less distinctly marked

- Polygynous
- Clutch size
- 4-5 eggs
- The incubation period lasts some 26-29 days

The breeding season begins in April when the monals are at higher altitudes. The male switches from calling only in the early morning to calling throughout the day.

Status: Still fairly secure in many areas

IUCN Status: Least concern

Feeding Habit

Chief food

- Terrestrial insects
- Tubers
- Mushroom
- Strawberries
- Maggots etc.

Distribution

Native:India, Nepal, PakistaN, Bhutan, China, Myanmar

Distribution in Pakistan

- Occurs 8000-12000 ft
- Kaghan valley and Azad Kashmir
- Found in Pallas valley
- Ayubia National Park

PPT 196-197: Chukor

Scientific Name: Alectoris chukar

Description: Larger than the common patridge.

Body length: Males measure about 34-39cm, Females about 30-34 cm

Body pinkish brown in color. Ribs like bars on flanks in buff. Legs and feet coral pink.. Claws dusty brown. Bill crimson to coral red. Sexes are similar, the female slightly smaller in size and lacking the spur. Black band runs across forehead through the eyes. This band goes down sides of neck to meet in a necklace on the upper breast. About 7 to 14 eggs are laid. The eggs hatch in about 23–25 days

Habitat

Lives on barren rocky slopes with sparsely stunted grass and bushes. In winters, it comes down to an elevation of 1200-1500 m. Re ascends in summer to 2500 m.

Feeding Habit

Wide variety of seeds and some insects as food. Birds feeding on succulent vegetation make up for their water needs but visit open water in summer

Distribution

Native: Asia, Palestine, Lebanon, Turkey, Iran, Afghanistan, Pakistan, India, Inner ranges of the Western Himalayas, Nepal

Status: Still fairly secure in many areas

IUCN Status: Least concern

Threats

Severe winters are known to affect the Turkish populations. Pesticides may now be a cause for concern in some areas

PPT 198-199: Tragopan

Facts:

Tragos= goat

Pan=Greek god

Tragopans are commonly called "horned pheasants" Having two brightly colored, fleshy horns on their heads. They can erect during courtship displays. There are five recognized species of tragopans.

- Western tragopan (Tragopan melanocephalus)
- Satyr tragopan (Tragopan satyra)
- Temminck's (tragopan Tragopan temminckii)
- Blyth's tragopan (Tragopan blythii)
- Cabot's tragopan (Tragopan caboti)

1. **Tragopan melanocephalus**

Syn: Western Tragopan , Black-headed Tragopan, Western Horned-pheasant

Description:

Medium sized pheasant. Sexes are highly dimorph. Male grey upper parts and reddish facial skin Numerous white spots. Each spot bordered with black and deep crimson patches on the sides and back of the neck. The throat is bare with blue skin while the bare facial skin is red. They have a small black occipital crest.

- Weighs 1.8–2.2 kg (4.0–4.9 lb)
- Length from 55–60 cm (22–24 in)

Females have pale brownish-grey upper parts finely vermiculated. Spotted with black, and most of the feathers have black patches and central white streaks.

- Weigh 1.25–1.4 kg (2.8–3.1 lb).
- Length 48–50 cm (19–20 in).
- Monogamous

Feeding Habit

The diet primarily consists of leaves of trees and shrubs. Also includes roots, flowers, acorns, seeds, berries, grubs and insects. Tragopans are shy and wary birds quick to hide amongst the dense vegetation they inhabit if disturbed.

Distribution

Native:India , Pakistan

Found in western Himalayas, between 8000-12000 from hazara eastward to Garhwali- ladakh

IUCN Status: Vulnerable

Distribution in Pakistan

- Largely restricted to area between Jhelum and Kunhar rivers of Hazara district
- Forest of Kaghan valley, in Machiara National park (A.K)
- Pales valley in Cholistan district

Threats

Hunting and trapping for

- Its meat (especially in winter)
- Its decorative plumage

Conservation

CITES Appendix I

PPT-200: Houbara Bustard

Scientific Name: Chlamydotis undulata

Description:

It is a large sized running bird. Measuring 60-70 cm in length. Weighs upto 1.5-2.5 kg. General body color is sandy ruff, pencilled splodged with black. Short crest of elongated feathers that are white at the base and tipped black. A ruff of black and white feathers on each side of the neck. Bill horny brown and legs greenish yellow. Females are somewhat smaller with ruff and neck plumes less developed.

Feeding habit:

- Omnivores but largely vegetarian.
- Feed on young shoots of wheat, mustard and other oil seed crops.
- Flowers of ground weeds, drupes and berries are also favored.
- It also feeds upon Black ants, Termites, Beetles, Grasshoppers, Centipedes, Small lizards and snakes

IUCN Status: Vulnerable

Distribution

Geographically it is distributed in a wide range across

- North Africa
- Middle East
- Western Asia

Distribution Native:

Algeria, Egypt, Libya, Mauritania, Morocco, Spain, Sudan, Tunisia, Western Sahara

PPT-201: Kingfisher

Scientific Name: Alcedo atthis

A family of small to medium-sized, brightly colored birds. Order Coraciiformes. They have a cosmopolitan distribution

Status: Still fairly secure in many areas

IUCN Status: Least concern

Threats: Hard winters are thought to be a significant threat to this species

Long term declines are thought to be due to chemical and biological river pollution. Most likely industrial waste disposal and agricultural chemical runoff. Canalization of streams and clearance of emergent vegetation to improve drainage result in loss of nesting and feeding habitat and declines in fish numbers. It is also at risk locally from persecution to protect fish stocks

Conservation Actions Underway

- Bern Convention Appendix II.
- EU Birds Directive Annex I.
- There are no known current conservation measures for this species within its European range.

Conservation Actions proposed

- Preservation of rivers and streams must be mediated through industry, agriculture and water authorities
- Research to investigate the importance of individual threats and mitigation measures against all the factors.