WILDLIFE BIOLOGY

(PG DEGREE STANDARD)

SUBJECT CODE: 292

UNIT - I: WILDLIFE OF INDIA

Definition of Wildlife: Causes of wildlife depletion; Economic importance of wildlife; need for wildlife conservation; Taxonomy & Identifying Characters of Fishes, Amphibians, Reptiles, Birds (up to orders) and mammals (upto family) with examples; rare, endangered, threatened and endemic species of fishes, amphibians, reptiles, birds and mammals in India- India as a mega wildlife diversity country.

UNIT - II: FORESTRY AND SILVICULTURE

Forest types in India - identification, dendrology; Deforestation & Impacts; Forest Inventory; Natural and artificial regeneration of forests; nursery techniques; seed - technology: Collection, storage, pretreatment and germination, establishment and tendings; Silviculture systems: Clear felling, uniform, shelter – selection, Coppice and conversion system silviculture of economically important species of India- *Pinus roxlurghil, Acacia* spp*., Dalbergia* spp*., Tectona grandis, Terminalia* spp.; Tree improvement & Seed Technology; Non timber forest products; Wood seasoning and preservation; Forest Mensuration: diameter, girth, height and volume of trees, form - factor, volume estimation of stand; Sampling methods and sample plots; Yield calculation; Forest survey - map reading; Watershed management; Establishment of herbaria and arboreta. Agro forestry systems - Social/Urban Forestry - Joint Forest Management - General forest protection against fire, insects, pests and diseases; Indian Council of Forestry Research and Education; Indian Forest Act 1927, Forest Conservation Act 1980.

UNIT - III: FOREST ENTOMOLOGY

Insect damage based on mode of attack- Leaf eater, Sap sucker, Meristematic tissue feeder, Wood destroyer- Harmful Insects and their role in forest economy: Insect pests of important trees of India -Teak, Sal and Bamboo; Role of locusts and termites in forest economy; Beneficial Insects and their role in forest economy: Scavenger insects- dung beetles; Pollinators, Predatory insects, and parasitic

insects on insect pests; Assessment of insect damage and control measures: Survey and estimation of insect abundance - devices for evaluation- methods of determining damage - biological evaluation; control of forest insects- direct and indirect methods - microbial insecticides and modern approaches.

UNIT - IV: ETHOLOGY OF WILDLIFE

Instinctive behaviour-classical and modern concepts-fixed action pattern and ritualization; Learning-Imprinting-habituation. Analysis of behaviour pattern - taxis, kinesis and reflexes; Methods of studying animal behavior; Biological rhythms and bird migration; Types of animal communications; Optimal Foraging behaviour; Origin and significance of play; Courtship, display, sexual selection and parental care in mammals and birds; Social behaviour of elephants and lion.

UNIT - V: WILDLIFE MANAGEMENT TECHNIQUES

Vegetative analyses – Point Centered Quadrat, Quadrat, Strip transect; GIS and Remote sensing in wildlife habitat surveys-Habitat manipulation: food, water, shade improvement; impact and removal of invasive alien species; Making observations and records: field notes & datasheets; Planning wildlife management Investigations and projects; Wildlife Photography: types of cameras, camera traps; Field Equipments: binoculars, altimeter, pedometer, field compass. Sound recording & Media players; activity recording; weight measurement; Radio isotopes; radio collaring; GPS; GIS; Remote sensing: Satellite images, Drones and their applications in wildlife management.

UNIT - VI: WILDLIFE CENSUS METHODS

Planning census – total counts - sample counts – Basic concepts and applications - Direct count (block count, transect methods, Point counts, visual encounter survey, waterhole survey); Indirect count (Call count, track and signs, pellet count, pugmark, camera trap, DNA finger printing and aerial photography) - Identifying animals based on indirect signs – Capture - Recapture techniques – Capturing and marking techniques: Live trapping of birds and mammals - Chemical immobilization; Methods of marking wild animals - Ringing- Tagging - Clipping - Colouring; Capture and recapture indexes.

UNIT - VII: HUMAN WILDLIFE CONFLICTS

Basic concepts, reason for conflicts, Identification of damages caused by wild animals and control measures; Chemical restraints: Advantage & Disadvantage – Basic considerations– Chemical restraints of Elephant, rhino, Gaur, Sambar, Panthera, small herbivores – post capture medical care & treatment; Case studies – Elephant, gaur, wild boar, monkey, tiger and leopard; Translocation of Wild animals – Principles, Methods and application.

UNIT - VIII: CONSERVATION OF WILDLIFE

in-situ and *ex-situ* conservation: Wildlife Sanctuaries, National Parks, Tiger Reserves and Biosphere reserves: Definition, formation, management and administration; Wildlife Projects: Tiger, Elephant, Lion and Hangul; Zoos and Zoological Parks: Definition - Aims of Zoos- Formation and Management of Zoos and Zoological Parks - Central Zoo Authority of India; Captive breeding: Aims, Principles, methods; Role of Government and Non-Government organizations in conservation; Wildlife administration and legislation: Administrative set up - Advisory bodies- National Board for Wildlife –Wildlife (Protection) Act, 1972 and its Amendments; Wildlife trade and regulations; Biodiversity Act 2000; Eco-Development, Eco- Restoration and Ecotourism programmes; Anti poaching operations –Village Forest Council (VFC).

UNIT - IX: HEALTH CARE OF WILDLIFE

Infectious wildlife diseases: Viral diseases: Rabies-Rinderpest-Foot and Mouth -Viral encephalitis-Yellow fever- Bacterial disease: Anthrax-Brucellosis-Clostridiosis-Listeriosis.

Protozoan disease: Trypanosomiasis-Toxoplasmosis-Babesiosis- Coccidiosis.

Helminth disease: Fasciolopsis-Schistosomiasis-Taeniosis-Hydatidosis Non-infectious diseases of wild animals: Diseases of the digestive system: Stomatitis-catarrhal, gastroenteritis-haemorrhagic gastroenteritis; Respiratory system: Catarrhal, bronchopneumonia-exudative pleurisy; Excretory system: Paralysis of urinary bladder-urolithiasis; Diseases and immune response – host parasitic interaction – hypersentivity– parasitic infections; tumour immunology; post-mortem analysis.

UNIT - X: RECENT ADVANCES IN WILDLIFE SCIENCE

Conservation Genetics: Scope and Genetic approaches to wild life conservation; Evolutionary genetics of natural populations- Loss of genetic diversity in small populations – Resolving taxonomic uncertainties - Genetic management of threatened species; Molecular phylogenetics of wildlife**;** Wildlife Crimes and its applications in detecting Wildlife crimes

Wildlife Toxicology: Types of contaminants– methods of toxicity evaluation – mode of action – bioconcentration- bioaccumulation and biomagnifications – impacts of pesticides and heavy metals on birds and mammals; CAMP and PHVA – Analyses and Reports; Environmental Impact Assessment (EIA) methods and their role in wildlife conservation.

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