In tropics, deforestation, land degradation, habitat conversion and biological invasions are major threats to biodiversity. Protected Areas such as National Parks and Wildlife Sanctuaries are in-situ conservation measures for preserving biodiversity. Nahargarh Wildlife Sanctuary – the study site selected in the present studies - is located in Aravalli ranges of Rajasthan and is about 22km from Jaipur. Assessment of the status of biodiversity in the face of human mediated disturbance is critical for the effective management of the Sanctuary. Community ecological approach enables not only to provide information on the spatial changes in plant and animal communities across the disturbance gradient of the landscape but also provide an insight on the response of communities to the ecological perturbations. Avian community dynamics is known to serve as bioindicator of the status of biodiversity and ecosystem health. Such studies on Nahargarh Wildlife Sanctuary are lacking. The present investigation was, therefore, undertaken with objectives: (i) to assess the extent of disturbance across the landscape; (ii) understand the composition, structure and species richness and diversity of plant and bird communities across the disturbance gradient of the landscape; (iii) to analyse interactions between plant and bird communities and (iv) to understand the role of biotic factors on nest predation.

My studies on the disturbance gradient across the landscape, using the distance of human settlement from forest border and relative impact factor calculated based on six anthropogenic activities, suggest that: (i) three distinct habitats
(regions) can be recognized - the least disturbed habitat represented by Nahargarh Biological Park (NBP), the moderately disturbed habitat represented by Jal Mahal Forest (JMF) and highly disturbed habitat represented by Kukas Forest (KF); (ii) there is no edaphic gradient across the landscape and the soils are highly buffered with high levels of organic matter and nutritionally rich; and (iii) disturbance contributes to homogenization of the habitat leading to reduction in ecological diversity as evident by absence of edaphic gradient.

The observations on the plant community composition and structure, and species richness and diversity across the habitats sampled indicate that: (i) the tropical thorn forest ecosystem with *Anogeissus pendula* as dominant tree is degraded to scrub, with alien invasive species *Prosopis juliflora* as predominant species in highly disturbed habitat; (ii) taxonomic diversity is high with most of the families represented by 1 to 2 percent of the total species only; and (iii) the communities are ecologically differentiated through ecological sorting of species across the disturbance gradient as evident from decrease in number of species (richness), tree density, DBH, foliage height diversity, species diversity and heterogeneity with increase in disturbance.

The studies on the avian community composition and structure, species richness and diversity, conservation status of the species, seasonal and annual changes in bird species, territory size and composition of feeding guilds demonstrate that: (i) the taxonomic diversity of birds in the habitats is high with most of the families being represented by 1 to 2 percent of total species; (ii) the bird communities are ecologically differentiated across the disturbance gradient; (iii) there are
pronounced seasonal and annual variations in bird species and these variations are perhaps associated with the phenology of the vegetation and the annual variations in precipitation and temperature; (iv) disturbance led to the local extinction of two critically endangered vultures in highly disturbed forests; (v) the food web size of birds decreased with increase in disturbance, and the three habitats showed marked variation in the number of dominant guilds and guild sizes; and (vi) most of the bird species are generalists.

The observations on the biotic factors that influence nest predation indicate that disturbance enhances the nest predation and forest edge effect also enhances nest predation within 50 m distance from the edge due to patchy distribution of forest and fragmentation of the habitat.

Correlative studies between attributes of plant community and avian community for each region suggest that: (i) strong linkage between attributes of plant and bird communities exist in least and moderately disturbed areas but these strong interactions are broken in disturbed areas; (ii) sustainable maintenance of biodiversity requires biotic integrity and disturbance disrupts the integrity leading to degradation of ecosystems; and (iii) imparting the resilience to the degraded ecosystem through restoration ecology may make it sustainable.
The results presented are discussed keeping in view of the objectives set forth in the thesis.

The work presented in this thesis is original and has not been submitted elsewhere for the award of any other degree or diploma.

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