5. IMPACT IDENTIFICATION

The present study was a part of comprehensive study conducted by Wildlife Institute of India to identify impacts of Narmada Sagar Project on flora and fauna with attendant human aspects. The most important step in EIA is the impact identification. The process of EIA revolves around the identification of cause and effect, a cause being any action of the proposed project which has an effect upon the environment (Anon. 1994). These effects are environmental impacts of the project. Any effect on the biophysical and socio-economic environment that arises from a cause directly related to the project is termed as a ‘first order’ or ‘primary impacts’. ‘Secondary impacts’ are those effects on the biophysical and socio-economic environments which also arise from an action but which are not initiated directly by that action. Their occurrence is defined by the inter-dependencies which exist within and between the two systems (Shopley & Fuggle 1984). In this section an attempt has been made to mainly identify the primary impacts of Narmada Sagar Project on avifauna. The basis for impact identification is the baseline information on bird communities that has been collected from Narmada Sagar Project area.

Impacts of Narmada Sagar Project on Avifauna

The results of the ornithological evaluation of submergence area suggested the potential richness of woodland and riverine bird species. The submergence of this woodland habitat would in all likelihood be a direct and irreversible loss to the overall avian diversity of the area. No endemic species has so far been
recorded in the study area, but there will be a potential impact on highly specialized species such as carnivore, insectivore/bark, and frugivore species. In the event of their migration to the adjoining forest a resource competition with existing avifauna may occur. The size of a forest being strongly related to the habitat requirements of the concerned animal species which have large home ranges may find it difficult to adjust and co-exist with the indigenous avifauna of adjoining forests. Serious depletion in numbers, particularly of the more specialized species may occur as a result of the primary impact of submergence of the forest habitat, specially the riverine areas.

In a river valley project, submergence of forest by a number of dams will break the contiguity of the forest. The total loss of the forest habitat will probably lead to the loss of a number of species confined to these habitats. Reduction in size of the forest is expected to lead to the loss of some species as has been postulated by MacArthur & Wilson (1967) and Whitcomb et al. (1976). At present it is undoubtedly the loss of habitat per se that is the most serious impact of development on ecology in India. However, following impacts on specialized species of birds have been identified:

1. The inundation of small rivers and streams may cause decline in the variety of fishes and invertebrates which are important components of the food chains. This may affect the concerned bird species such as herons, egrets, bitterns, water hens and king fishers. Loss of feeding
ground such as shallow areas on the banks of rivers and streams would affect species like lapwings, plovers, sandpipers and shanks.

2. Loss of riverine trees and shrubs is likely to lead to the loss of perching and nesting sites of species such as flycatchers and owls.

3. Loss of bushes and dense herbaceous vegetation, which are important for feeding and nesting, may affect species such as warblers, babblers, munias and weaver birds.

4. Forest clearing in proposed submergence area is apprehended to adversely affect the ground dwelling birds such as partridges, quails, peafowls and spurfowls. These birds nest on ground and any change like forest clearing on a large scale would severely disturb the breeding ecology of these species resulting in their population decline.

5. Species such as buzzards, hawks, eagles and owls which are highly territorial and require large areas as home ranges, would be adversely affected by the loss of the forest due to submergence. The movement of these species to the adjoining forest may create resource competition with the population of the same species there.

6. Species such as woodpeckers, nuthatches, barbets, tits and hornbills, which are bark gleaners and are dependent on old trees for feeding and
nesting, may suffer due to the loss of old mature trees, and may face resource competition from existing avifauna of the forest adjoining the submergence area.

7. The presence of more than 30 species of riverine birds shows the suitability of the Narmada river and its tributaries as a habitat for riverine bird communities (Appendix 3.1). These communities will be adversely impacted by the proposed submergence. Considering the ecological similarities of Tawa Reservoir (M.P.) with Narmada Sagar Project area, a comparative study was conducted in Tawa Reservoir. Tawa Dam was completed some 15 years ago and large forest area was submerged for construction of dam and reservoir. It can be expected that the effects of the developmental changes that took place there will also take place in Narmada Sagar Project area. Based on the observations in Tawa area, the likely chain of ecological events in the study area is as follows: Changing a lotic riverine ecosystem to lentic reservoir system would adversely modify the existing habitat conditions and its impact on most of the riverine birds may be undesirable. Migrant birds are affected by the conditions prevailing in their wintering grounds and along their migratory pathways. The abundance of migrant bird species, therefore reflects the suitability of a particular site as a habitat because the condition of the resources in the area may affect a bird's "decision" to remain or migrate further (Steel et al. 1984). In the study area some of the migrant species were recorded in good numbers. Most of these migratory species are aquatic and dependent on the river system for feeding
and breeding requirements. Inundation of sand and rocky banks and islands would affect the ecology of these species. The fish fauna will be changed when the reservoir is formed. The present fish diversity will be lost and commercially important fish species like carps will dominate the new aquatic system. The piscivorous bird species such as cormorants, darters, egrets, herons, storks, ibis and spoonbill would be affected by this change of aquatic system and fish fauna. The proposed reservoir will be very deep and the composition of aquatic vegetation would be very different than what it is at present. It has been observed that aquatic weeds take over the deep reservoirs (Moss 1980). If it happens here too, birds such as pintail, gadwall, spotbill duck and shovellers which feed on vegetation growing in shallow water will be deprived of their natural food and may disappear from NSP area.

Birds do have special advantages over other groups, because of their consciousness, ubiquity and ecological diversity which make them worth studying. It is to be hoped that documentation of changes in bird species diversity may to some extent, mirror the changes in species diversity of other groups.