Executive Summary

Increase in human population and escalating per-capita impacts over the last century have greatly intensified the threats to Earth's life-support systems (UN 2016; Bradshaw and Brooks 2014). Protected areas are the cornerstone of biodiversity conservation; they maintain key habitats, provide refugia, allow for species migration and movement, and ensure the maintenance of natural processes across the landscape. Not only do protected areas secure biodiversity conservation, they also secure the well-being of humanity itself. In parts of the world where most of the landscape has already been transformed by agriculture or industry, protected areas may be the only natural or near natural ecosystems remaining for large areas. The wider socioeconomic and cultural values of these natural ecosystems are increasingly being recognised, as are the important ecosystem services they provide. Increasingly, protected areas (PAs) are expected to serve dual goals: protect biodiversity and secure ecosystem services. Protected areas are critical for the conservation of residual tropical forest biodiversity, yet many of these are being deforested by humans both within and outside of their administrative boundaries. Therefore, it is critical to document the significance of protected areas for conserving tropical biodiversity.

Area admeasuring about 4.27 sq. km. of reserved forest of Alibagh Forest Division was declared as Karnala Fort Sanctuary in the year 1968. However, considering its importance and the provisions available in Wildlife Protection Act, 1972, an area of 12.109 sq. km of reserved & acquired forest including the earlier declared area was notified as Karnala Bird Sanctuary. Karnala Bird Sanctuary is an important Woodland Bird Specified Area in the Protected Area Net Work of the Maharashtra State. The sanctuary is situated on Mumbai - Goa highway. This Sanctuary provides shelter to the local as well as migratory birds. The terrain is hilly and situated on one of the western spurs of North Sahyadri Range. This is unique Woodland Bird Sanctuary has about 92 resident bird species and 40 species of migratory birds. *Gnetum ula* (Umbali) a very rare plant is found here along with *Entada rheedei* (Garambi). Karnala fort is historically a very important feature of this Sanctuary and has been a major attraction for treckers.

The scope of the project is to estimate the population sizes of various species of organisms using the quadrat method for an inventory of floral and faunal elements and to record the RET species in the sanctuary**.**

Vegetational Survey

i. Survey was carried out for site selection, identification of forest types, size of the area and species availability in consultation with the forest department

ii. The topography of Karnala Bird Sanctuary was noted and then Transect belts were identified.

iii. Belt Transect of dimension 1km x 10m has been laid in the entire study area in rugged hills, flats and hilltops for quantitative assessment of the plants. In the belt transect survey plant species was observed and recorded (Sutherland, 2006).

iv. Regular field surveys were undertaken, in all seasons, to cover selected areas.

v. Transects and quadrats of different sizes were laid for trees, shrubs, climbers and herbaceous plants depending upon their micro and macro habitats. Random Sampling was carried out for Trees (10 x 10m), Shrubs & climbers (5 x 5m) and herbs (1m x 1m).

vi. GPS coordinates were taken for each quadrat. Annexure I gives the location of the quadrats

vii. The collected data was analysed for occurrence, frequency and dominance in terms of habit and family

viii. Field visits spread across the seasons in different zones of Karnala Bird Sanctuary were conducted

ix. Floral species were observed and recorded

Butterfly Survey.

Checklist surveys was employed primarily to confirm the presence of butterflies

Avian Survey

Distance sampling technique was used to record the avian fauna

Results

Vegetational Survey

9 Belt Transects were laid for trees measuring 1km x 10m. 96 quadrats were laid including 49 for herbs (1m x 1 m) and 47 for shrubs (5m x 5m). During the study period, 232 plant species belonging to 85 plant families were recorded. 26 families were recorded with highest number of members. Habit of species spanned across trees, herbs and shrubs including epiphytes, parasites, ferns and climbers. % frequency, density and abundance have been calculated for 190 species documented in transects and quadrats and graphs of the same have been represented in the report. Plant species recorded were identified with the help of Floras (Almeida 1996 – 2014, Sharma et. al. 1996 and Singh et.al. 2000). The nomenclature of the plants was updated as per theplantlist.org website. The Data was analysed to represent % frequency, Density & Abundance along with the total number of plant species. The data also includes habitwise distribution of species.

Bird Survey

101 species of birds belonging to 48 classes were observed throughout the study period in the project area.

Butterflies Survey

49 species of Butterflies were observed throughout the study period in the project area.

Regular monitoring needs to be conducted to record seasonal changes and change in vegetational composition. This will help in better management of the Sanctuary. Since the area covered under this study was 5% of the Sanctuary area, it is recommended that a more comprehensive study be required to be carried out to ascertain the biological diversity of the Sanctuary