Margallah Hills National Park

Ecological Baseline

Draft Report

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Capital Development Authority

Himalayan Wildlife Foundation
Islamabad

1. Introduction

This ecological baseline for the Margalla Hills National Park (MHNP) was prepared by the Himalayan Wildlife Foundation under the project 'Margallah Hills National Park: A Sustainable Management Strategy' supported by the UNDP/GEF Small Grants Programme and implemented in collaboration with the Capital Development Authority, Islamabad. A social baseline for the MHNP is presented in a separate volume. The purpose of this ecological baseline is to provide a compilation of information that is useful for the researchers, park planners, and those who want to learn more about the wildlife and natural resources of the Margalla Hills. It is expected that the document will provide a base on which further information can be added in the future to enhance its value and quality.

1.1 Overview of the Margalla Hills National Park

MHNP, situated immediately to the north of the Federal Capital of Islamabad at 33°48'N, 73°10'E, has been placed in The World Conservation Union (IUCN) Management Category V (Protected Landscape). It was declared a national park on 27 April 1980 under Section 21(1) of the Islamabad Wildlife (Protection, Conservation and Management) Ordinance, 1979. Prior to 1960, much of the area was a reserve forest. Subsequently, it was declared a wildlife sanctuary comprising an area of 17,386 ha under the West Pakistan Wildlife Protection Ordinance, 1959. Areas merged into the MHNP include compartments 2-5, 7-23, 28, 30-38(i) and 41(ii) of the Margalla Forest Reserve, compartments 1-25 of the Military Grass Farm, and various other lands making a total area of 14,786 ha. A map of the area is given in **Exhibit 1.1**. History of landholding in the MHNP is illustrated in **Exhibit 1.2**.

The Margalla Hills range between 456 m and 1,580 m in altitude. The topography is rugged, with numerous valleys and steep slopes. Rocks have been observed to date back to the Jurassic and Triassic ages, limestone being characteristic of the region (though shale, clay, and sandstone are also present). Soils are dark, with a high mineral content, and are capable of supporting good tree growth despite being shallow.

The climate is subtropical semi-arid. The region lies in the monsoon belt and experiences two rainy seasons. Winter rains last from January until March, and summer rains from July to September. Temperatures range from 1-15 °C in winter and 20-40 °C during the summer. Annual average rainfall is 1,000 mm. There have been occasional incidents of light snowfall in severe winters (Niazi 1999, Kalyar 2004, Gulshan 2004).

Despite its small size, the fauna of the Margalla hills is quite diverse. This can be attributed to habitat diversity, thick vegetative cover, and steep slopes that provide shelter to the important park species such as grey goral. The Margalla hills are an extension of the Himalayas and provide a corridor for many Himalayan species to reach southern parts such as the Kala Chitta Hills. The area is rich in floral and faunal biodiversity. The MHNP is home to many animal species such as rhesus monkey, barking deer, grey goral, wild boar, jackal, porcupine, mongoose, pangolin, leopard, various birds of prey, game birds, reptiles, fish, snakes, and a variety of butterflies. Surveys conducted recently by HWF in the Park recorded 31 species of small and large mammals, and 218 of birds. Out of these, 82 are resident, 32 are summer visitors and breeding species, 73 are winter visitors, and 31 are transit migrants mainly from and

to the Himalayan heights. The number of amphibian and reptile species observed in the surveys were 21, while 22 species of fish and 25 species of butterfly were recorded.

When the MHNP was first notified, the habitats of the Margalla Hills range were already severely degraded and modified for agricultural purposes. The forests had been cleared, and trees closer to human habitations had been cut down in large numbers. Bushes and grasses were victim to over grazing resulting in extensive soil erosion. Most of the western half of the Park is under erosion due to the presence of stone quarries and a lack of vegetative cover. Muddy water flows into the park's streams from these areas in the rainy season.

Stone quarries had been established at various points on the southern face along the entire range. Native game species were under the threat of hunting, netting, and trapping.

Sustained management activities by the CDA have lead to significant vegetative re-growth over the last 30 years on the southern part of the mountain facing Islamabad in the eastern half, between Bari Imam area and Faisal mosque. However, the theft of wood is still rampant in the rest of the hilly region, and livestock grazing has gradually increased near the villages due to increased populations and the increase in the demand for milk in Islamabad.

Law enforcement was however effective in areas closer to Islamabad. Hunting was banned, although hidden poaching continues. Quarrying and stone crushing was ultimately prohibited in the eastern half of the National Park. Plantation campaigns by CDA and others have contributed to reducing the negative pressure of communities on habitats in the areas facing Islamabad. Flora and fauna have occupied protected areas in increasing numbers with the passage of time.

There are over 131,000 people living in 25 major rural settlements within and in the close proximity of the National Park. The people rear livestock in large numbers and procure fodder from the Park. In addition, large herds of goats are brought down from higher valleys in the winter months to graze. Other activities contributing to the degradation of natural habitats in the Park include sewerage water flowing down the mountain slopes, burning solid waste in the open, and depleting groundwater from wells and springs. Other villages in the vicinity of the Park collect firewood and depend on local grazing grounds.

There are 24 areas in the national park where seasonal forest fires take place, according to the Capital Development Authority (CDA). Fires in the Park usually occur in the dry months of April, May, June, and early July. These months coincide with the breeding season of indigenous birds. Consequently, habitats, flora and fauna, and nestlings alike suffer.

There is a police check post, a small building that houses the Margalla conservation and information center (MCIC), a car park, and the Islamabad zoo at the main entrance of the National Park at Marghzar base. There are also overhead electricity and telephone wires traveling along the side of the road up to Pir Sohawa.

A two-lane metalled road and the installation of roadside lights in the Park has increased traffic—and subsequently air and noise pollution—from Islamabad to Daman-e-koh, Pir Sohawa, and the Makhnial range, especially on national and religious holidays. The road begins at Marghzar, zigzags up the hill and over the crest of the mountain to Pir Sohawa where there are several restaurants, more planned in the near future, and two CDA lodges. The road continues on to the northern adjacent Makhnial range. It has two branches going down the Neeli kassi valley. Another road winds through the Shahdara valley on the eastern side and connects with the main road at the top of the range. There is also a road to Talhar village and Gokina village, and a network of roads to the eastern flank of the Park.

There is regular morning and evening private transport traffic from the villages to Islamabad and beyond for hundreds of workers and students. There is a cement factory at its base and many quarrying sites in the ridges at the western edge of the mountain. Other human disturbances include several trekking paths, which are very popular with the citizens of Islamabad. Visitors have developed a tendency to feed monkeys along the paths, thereby creating an imbalance in species as well as unnatural polarization of monkeys and other scavengers, and making the park attractive for the predators such as leopards.

1.2 Threats to the Ecosystem

Human settlements in designated natural areas of the MHNP constitute the most serious threat to park resources. The issues relating to the settlements and their impact on the park are complex and present a difficult challenge for park management. About 80% of the Park comes under the CDA's jurisdiction, but many settlers continue to illegally occupy property, and resist CDA efforts to move them from the park.

People living in the park allow their livestock to graze freely; they cut trees for fuel; gather fodder for animals; and divert natural water streams to cultivated plots near their homes. Some residents even hunt native animals such as hares and birds for food and sport. Human impact is greatest near villages where the slopes are gentle.

The sites of 57 rock-mining quarries are the most severely degraded places in the Park. They have destroyed vegetation and natural rock formations in seven locations where more than 800 hectares have been mined. Six of these are rock-crushing operations located in the valleys. One quarry is a 300 hectares limestone mine, located deep in a valley. Quarries operate on lease arrangements made by the Planning Directorate of the CDA. Some leases were granted after the park was established but public pressure brought mainly by a citizen's group 'The Margalla Hills Society', forced the termination of such leases. The CDA ordered the closure of all mines on 31 July 1991. Most of the quarries have discontinued operations and others are expected to be closed in the near future. The Fecto Cement company's 30 year lease for mining limestone, granted in 1983 is however, not included in this order. There is an obvious conflict between park laws and management objectives.

Fires are a fairly common occurrence in the Margalla Hills and require significant expenditure and manpower to extinguish. Eighty-five per cent of these fires occur during the dry May-June period preceding the monsoon rains. The number of fires averaged 43 per year between 1986 and 1991. Most of the fires occur on the upper slope or ridge top sites on southern aspects, and tend to be manmade.

Grazing of livestock has become a serious problem. The regeneration of forest cover is nearly impossible when such large numbers of cattle trample young seedlings. Cattle, goats, water buffaloes, sheep, and donkeys compete with native animals for food and space. Native animals are invariably forced to retreat to increasingly smaller and less suitable habitat. Maqsood (1991) estimates that of the 7,000 domestic ungulates in the park, 42% are goats, 31% are cattle, and 25% are water buffaloes. He presents a convincing positive correlation between the remaining goral and barking deer habitats and the low number of livestock. These small ungulate species are the only native ones still found in the park, and their populations are critically low. In a park as small as the MHNP, it is probably not possible to protect populations of native animals if livestock is also permitted to graze in the same area.

The expansion of human settlements in the park area is also one of the major threats to the Park. Adjacent to the mountains along the southern side is the capital city. To the northwest is the incipient industrial center of Taxila. Encroachments from these urban areas pose serious

threats to the integrity of the wilderness of the Park. Similarly, the construction of roads and expansion of Saidpur and Nurpur villages are also threatening the park environment.

The air around the National Park carries a heavy load of suspended particulate matter produced due to rock mining and the cement factories in the area. It may also carry noxious gasses. Polluted air also obscures the view of Islamabad from the hills. This is ironic, as the city was originally planned in this location for the attractive backdrop of the hills. Polluted air also affects public health and has been shown to be a direct contributor to increases of upper respiratory illnesses. Certain types and amounts of air pollutants also harm plants and wildlife.

The unscientific introduction of exotic vegetation like Broussonetia papyrifera Parthenium and Lantana camara has disturbed the balance of nature in the park. For example, the paper mulberry (B. papyrifera) imported from Japan in 1960 is an extremely invasive and undesirable exotic tree species. It is fast growing and forms dense thickets, causes allergies, and competes with local species.

1.3 Methodologies Employed

Studies and reports on the wildlife of Margalla Hills include Anwar and Ahmad (1988), Anwar (1986, 1989 a, 1989 b, and 1991) covering birds, mammals—with special emphasis on the population and behavior of Goral—, and reptiles, and Hasan (1994) covering butterflies from Islamabad and the Murree Hills. Other work on birds in the Islamabad and environs includes Ward (1994) and Sahibzada (1998). Population estimates of the important animal groups, their status, habitat preference, possible threats, distributional ranges, and areas of high density in the park, however, have not been determined. A comprehensive survey of all animal groups, the subject of this baseline survey, was therefore considered essential for a better understanding of the ecosystem of the park, and initiating subsequent measures for its conservation. The methodologies used in the ecological studies conducted as part of the baseline study of the MHNP are as follows:

- Plant species in the park were collected and identified in the Quaid-e-Azam University (QAU) herbarium;
- Small mammals were collected using Sherman traps while larger mammals were trapped by harp traps; Large mammals were also observed using binoculars (10:35) and spotting scopes (15-60 power), using hideouts and luring techniques. The hideouts were usually assembled near water points or springs.
- Data sheets prepared for each group of animals were used for data recording.
- Snakes were collected by snake clutches while amphibians were collected by hand. Reptiles other than snakes were collected by hand, and photographed;
- Hand nets were used for the collection of butterflies;
- Fish were collected using cast nets, drag nets and hand nets;
- Bird watching sessions and surveys were conducted in the mornings for 2–3 hours soon after sunrise, and again in the eveningsabout 2 hours before sunset. Surveys were more often morning activities;
- Bird habitats and flora were studied in order to find ecological linkages between the plants and the birds such as preferred food plants, nesting plants, roosting plants, and sheltering—when threatened—plants. Floral species occurrences in the Margalla range were studied in order to categorize habitats preferred by different bird species;
- Seasonal occurrences of birds were studied on several occasions during the year;
- Habitats and the occurrence of flagship species were identified and marked on maps;

1.4 Study Team

The following team of experts conducted the ecological base study:

- Ali Nawaz, Ecologist (Team Leader)
- ZB Mirza, Biodiversity Specialist
- Vaqar Zakaria, Environment Specialist (Advisor)
- Mohammad Rafiq, Mammalogist
- Dr Muqqarab Shah, Vegetation Expert
- Dr Riffat Malik, Habitat Specialist
- Noor Kamal Khan, Botanist
- Mohammad Younas, Wildlife Observer

The ecological baseline report has been categorized into eight sections.

Section 2
(*Flora*) describes floral diversity, vegetation communities, and habitat types of the area.

Section 3
(*Ethnobotany*) describes the medicinal use of plants in the Margalla Hills and other benefits that local communities derive from these plants.

Section 4
(*Mammals*) describes mammalian fauna of the MHNP including predators, ungulates, and small mammals.

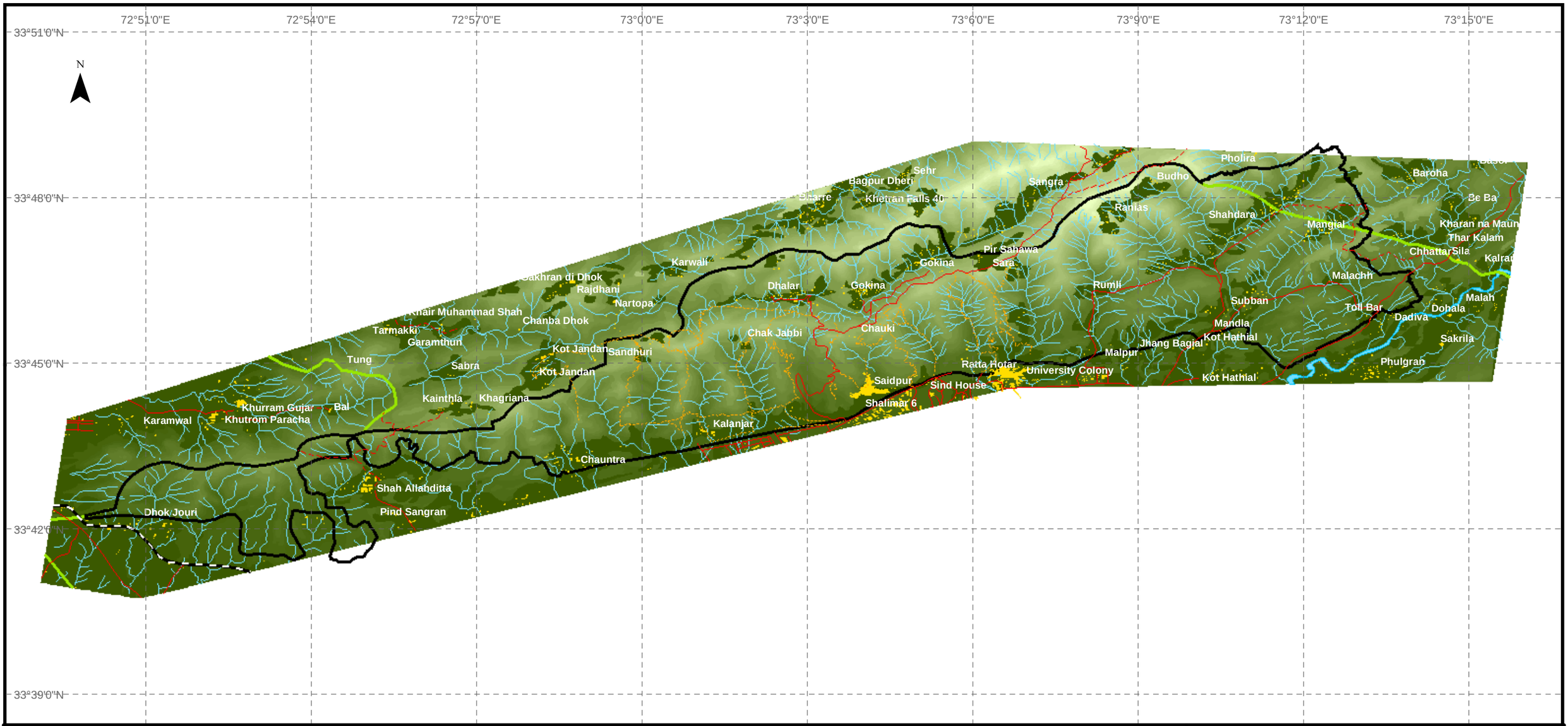
Section 5
(*Avifauna*) describes the diversity of birds in the MHNP.

Section 6
(*Fish*) provides information on fish fauna and its distribution.

Section 7
(*Reptiles*) provides information on the reptiles of the area and their seasonal population sizes.

Section 8
(*Butterfly Fauna*) describes the butterflies of the MHNP.

Section 9
(*References*) gives a list of literature cited in the text.



Legend

Cultivated Area	
Park Boundary	
District Boundary	
Main Roads	
Jeepable Tracks	
Railway Track	
Major Stream	
Minor Streams	
SoP Settlement	

Elevation

0 - 1700	
1701 - 2500	
2501 - 3000	
3001 - 3500	
3501 - 4000	
4001 - 4500	
4501 - 5000	
5001 - 5200	

0 2 4 6 8 km

Margalla Hills National Park

Exhibit 1.1
Base Map of MHNP

Scale	1 : 130,000
Source	SoP and Field Survey
Drawing	W6E02MHP
Date	October 2006
Client	-

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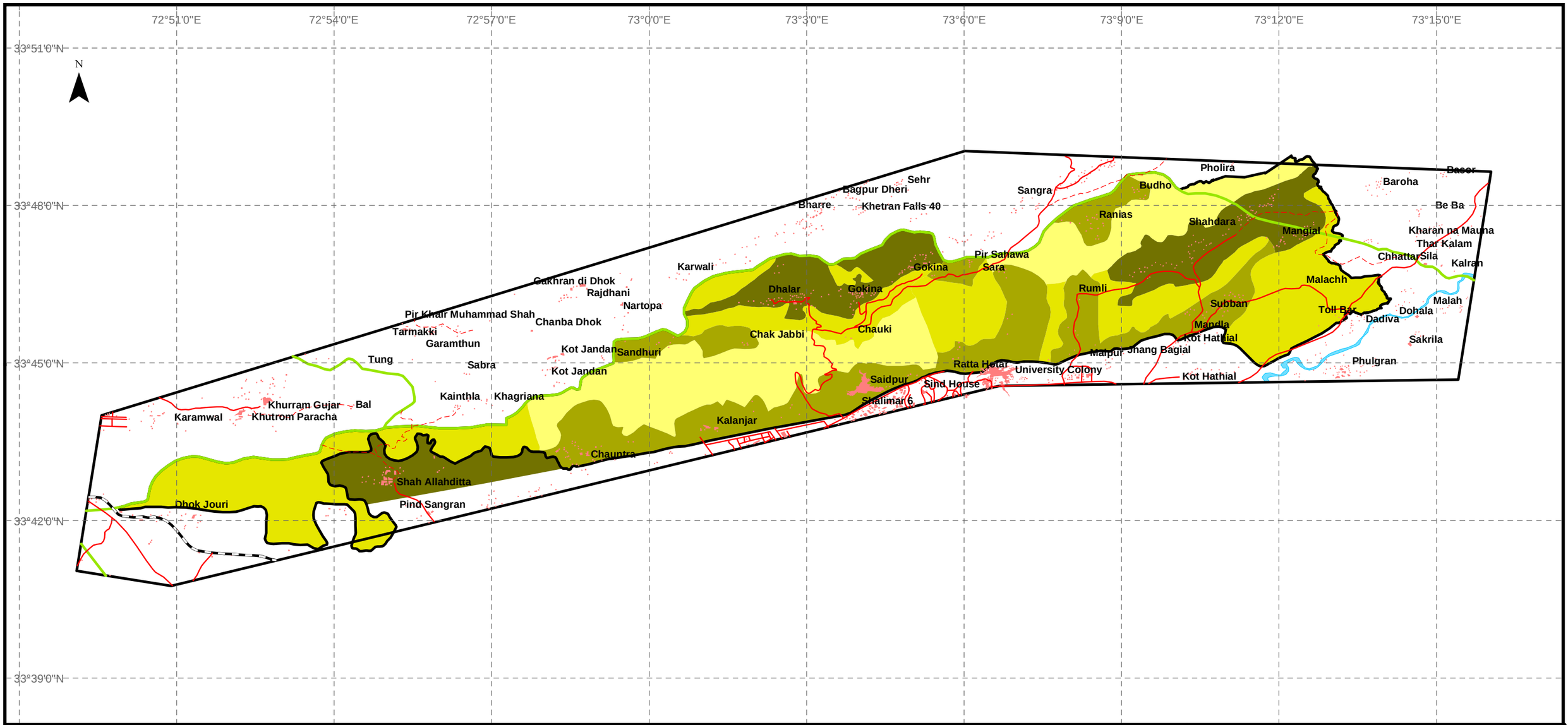


Legend

- CDA Unacquired Land
- CDA Acquired Land
- CDA Reserve Forest
- Military Grass Farm
- Park Boundary
- District Boundary
- Main Roads
- Jeepable Tracks
- Railway Track
- Major Stream
- SoP Settlement

0 2 4 6 8 km

Margalla Hills National Park

Exhibit 1.2
History of Land Holding in MHNP

Scale	1 : 65,000
Source	SoP and Field Survey
Drawing	W6E02MHP
Date	October 2006
Client	-

Himalayan Wildlife Foundation

2.Flora of Margalla Hills

2.1 Literature Review

The flora of the Margalla Hills Range is divided into three major ecological zones based on the following forest types (Champion et. al. 1965, Roberts1992):Overview of the Margalla Hills National Park.

- ropical Dry Mixed Deciduous Forest
- Dry Sub-tropical Semi-evergreen Scrub
- Sub-tropical Pine Forest

Several ornamental trees have also been added to the natural forests. The major species planted include *Grevillea robusta, Erythrina suberosa, Jacaranda mimosifloia, Callistemon lanceolatus, Cassia fistula, Ehretia laevis, Cassia glauca, Pongamia glabra,* and *Eucalyptus spp (Zafar uddin et al, 1983).*

Diversity

The vegetation of the Margalla Hills is largely supported by the monsoon rains. The flora which is mostly sub-tropical in origin, is a remnant of the natural communities from the great Indo-Himalayan ecosystem extending north-east into the greater Indian sub-continent and southeast Asia. The Margalla Hills are one of the western-most extensions of this important bio-ecological region, and as such represents a contact zone with the arid Irano-Saharan ecosystem that extends south west. It is here that the natural ranges of several plants from both regions overlap. The southern aspects of these hills have thin soils. The rainfall is also marginal. The flora therefore has a short stature, and somewhat xeric (dry climate species) broad-leaved deciduous and evergreen forests. Along with that grows a diverse shrub under story. Tree stature diversity increases in ravines. Pines are dominant in the northern aspects and in elevations higher than 1,400 m, where it is cooler and precipitation is more effective. Groves of oaks are still found in some places. A checklist of plants found in the MHNP is given in **Appendix A.** The common trees, shrubs, and herbs of the Park are as follows:

Trees: *Acacia catechu* (L.f.) Willd, *A. nilotica* (L.) Delile., *A. modesta* wall., *Bauhinia variegata* L., *Butea monosperma* (L)., *O. kuntze*, *Maytenus, rayleanus* (wall. ex Lawson) Cufo., *Olea ferruginea* Royal., *Phyllanthus emblica* L., *Pinus roxburgii*, and *Quercus leucotrichophora A. camus.*

Shrubs: *Carissa opaca Stapf ex Haines., Calotropis procera (Willd) R. Br., Dodonaea viscosa (L) Jacq., Justicia adhatoda L., and Otostegia limbata (Benth) Boiss.*

Herbs: *Allium jaquemontii kunth., Arundo donax L., Cannabis sativa Linn., Centaurea iberica trev. ex Sprengel., Eulophia dabia (D. Don) Hoch., Geranium ocellatum Camb., Hibiscus caesius Garckie., Incarvillea emodi (Royal ex Hindle) Chatterjee., Pennisetum orientale L C Rich ., Saccharum sponteneum L., Scilla griffithii Hochr., Tulipa stellata Hook. f., and Typha elephantina Roxb. (Syn: T. latifolia Edgew.).*

Major Vegetation Habitats

In general, four distinct vegetation habitats or zones can be identified in the MHNP.

- subtropical dry semi-evergreen forest
- subtropical pine forest
- subtropical dry semi-evergreen forest (degraded)
- Invasive sp. Brousonetia papryrefera dominated vegetation

The MHNP was divided broadly into eight different zones for classification purposes (see **Exhibit 2.1**). These include settlements; cultivated land, degraded land including scattered houses and cultivated fields, degraded forest at low and high altitudes, vegetation dominated by paper mulberry, subtropical pine, and semi-evergreen forest. Satellite remotely sensed SPOT XS data in three wavelengths including visible and near infrared with a spatial resolution of 20 m was used for land cover classification. Remotely sensed data was classified using simple supervised classification and was integrated with other ancillary information.

Subtropical Dry Semi-evergreen Forest Zone

It is characterized by the dominance of *Acacia modesta* and *Olea ferruginea*, associated with *Dodonaea viscosa, Carissa spinarum,* and *Zizyphus jujuba*, having undergrowth of various shrubs. Among the shrubs, the thick *Dodonea viscose* is dominant. *Carissa opaca, Lantana camara,* and *Woodfordia fruticosa* are sub-dominants, whereas other major associated shrubs are *Justicia adhatoda* and *Sageretia thea*. Other main associated tree species are *Cassia fistula*, *Lannea coromandelica, Bauhinia variegata,* and *Grewia optiva*. Common grasses associated with this zone include *Chrysopogon serrulatus, Bothrichloa pertusa, Heteropogon contortus, Pennisetum orientale,* and *Themeda anthera*. Unplanned plantations of ornamental tree species such as *Grevillea robusta, Erythrina suberosa, Jacaranda mimosoefolia, Callistemon viminalis, Ehretia laevis, Pinus roxburghii, Cassia glauca,* and *Eucalyptus sp.*, within the reserve forest can also be seen particularly at the lower elevation. This zone is also characterized by *Porana paniculata, Ziziphus mauritiana, Asparagus adscendens, Ziziphus hysudrica*, and *Rhamnus pentapomica. Porana paniculata*, which is a woody climber, makes a very conspicuous appearance in this zone. *Broussonetia papyrifera*, one of the major invasive plant species in the Himalayan foothills also dominates at lower elevations particularly in plain areas.

Transitional Zone

It is distinct at higher elevations above the scrub forests, particularly above 700 m. It exhibits a large number of evergreen and deciduous plant species. The canopy is thick, protecting the trees from indiscriminate cutting. The under storey and shrub cover is also fairly thick and is dominated by large numbers of unpalatable, mostly evergreen plant species with small leaves such as *Dodonea viscosa, Carissa opaca, Justicia adhatoda, Woodfordia fruticosa, Maytenus royleanus,* and *Flacourtia indica*. The canopy is dominated by *Mallotus philippensis* at certain places, whereas *Cassia fistula* sub-dominates, along with other associated species such as *Acacia catachu, Bauhinia variegata, Bombax ceiba, Nannorrops ritchiana, Siamalia sp., Albizia sp.*, and *Lannea coromandelica*. Most of the trees belong to the tropical moist deciduous forest. *Olea ferruginea*, an important member of the subtropical forest, can be found mostly on cooler aspects with patchy growth. This indicates its preference towards mesic conditions or shady slopes rather than steep, un-shaded slopes. *Pistacia chinensis* was found at an average height of 809 m, mostly in valleys where more moisture was available. A fairly good cover of *Phyllanthus emblica, Olea ferruginea, Bombax ceiba*, and *Phoenix sylvestris* can be found in some places.

Subtropical Pine Forest Zone

Subtropical pine forests are characterized by the presence of *Pinuis roxbughii* as a dominant species. *Myrsine africana, Woodfordia fruticosa, Berberis lycium,* and *Carissa opaca* constitute subordinate species at the shrub layer. This habitat type is present at higher slopes mostly above 900 m, and is composed of a large number of herbaceous plant species where plenty of moisture is available. Perennial or annual herbs largely dominate the herbaceous cover. The under storey is sparse, especially the brush growth. Un-decomposed pine needles form a thick mat covering the forest floor at some sites. Of the tree species, *Pinus roxburghii* forms the main canopy. Among the shrubs, *Berberis lycium, Myrsine africana*, and *Carissa opaca* are found in varying proportions depending upon their distribution at different slopes and aspects. *Rumex hastatus* is one of the commonest small shrubs among the rocks in the Margalla Hills. Amongst the other characteristic species that are found in this habitat include *Plectranthus coetsa, Rubus fruticosus, Teucrium quadrifarium, Vitis jacquemontii, Plectranthes rugosus, Geranium himalayense*, and *Inula cappa*. Typical herbaceous plants include *Viola sp., Micromeria biflora, Adiantum incisum, Galium sp., Plectranthus sp., Geranium spp., Fragaria sp.*, and *Rubus sp*. Among the grasses, *Themeda sp.* and *Heteropogon contortus* are well represented. The region is characterized by soils with low pH values with the altitude ranging between 930 m and 1,230 m on the north and northwestern aspects.

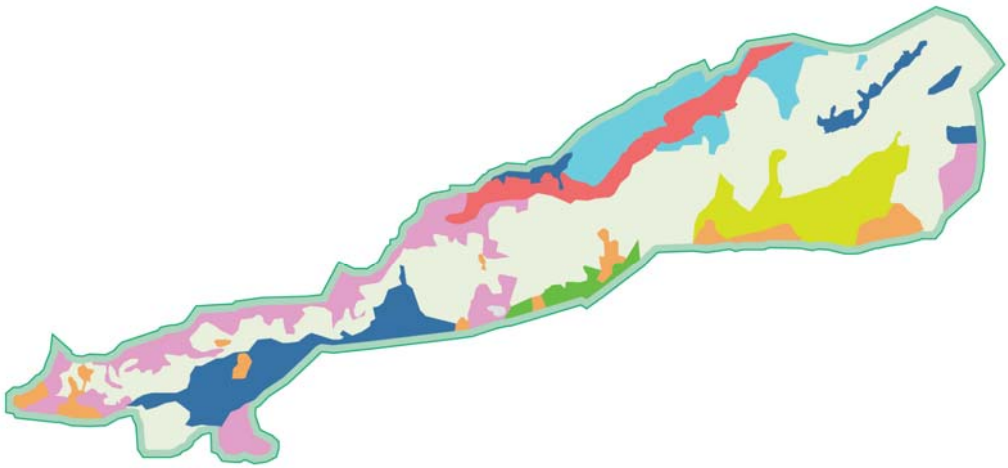
Mixed Vegetation Zone on Moderate and Moderately Steep Slopes

This vegetative zone is generally species rich at high altitudes, but less so on steeper slopes. *Rosa brunonii, Punica granatum, Quercus leucotrichophora, Xylosma longifolium,* and *Debregesia salcifolia* are the characteristic species of this habitat type. The vegetation is dominated by *Pistacia chinenesis* and *Berberis lyceum* with a fairly continuous low scrub growth of xerophytic shrubs and sub-tropical pine forest species. *Pinus roxburghii* usually occurs in scattered tree groups. Associated tree species includes *Pyrus pashia*, *Mallotus philippensis*, *Xanthoxylum armatum*, and *Casearia tomentosa.* Associated shrubs include *Myrsine africana*, *Carissa opaca*, *Dodonea viscosa*, *Woodfordia fruticosa*, and *Lantana alba*. The herb layer is composed of a large number of annuals and perennials including Adiantum *incisum*, *Fragaria sp.*, *Viola sp.*, *Plantago lanceolata, Rubus sp., Plectranthus sp., Diclyptera roxburghiana, Micomeria biflora*, and *Sida cordata. Themeda sp., Heteropogon contortus,* and *Apluda mutica* are the main grasses associated with this plant community. *Pistacia chinensis*, *Celtis australis*, *Punica granatum,* and *Quercus leucotrichophora,* which has been designated as endangered plant species, can be found here. This is one of the most species rich zones in the MHNP. At some places greater number of large diameter trees of *Pinus roxbughii* along with *Myrsine Africana* dominate as compared to other species..Other main associated woody species are *Cotinus coggyria*, *Indigofera sp.*, *Rhus javanica*, *Cassearia tomentosa*, *Buddleia asiatica*, *Lantana alba*, *Carissa opaca*, *Dodonea viscosa* and *Woodfordia fruticosa*. *Cotinus coggyria* can be found in large density particularly on slopes that represent post fire vegetation.

Invasive sp. Broussonetia papyrefera Dominated Vegetation

It has a conspicuous appearance in the foothills of the MHNP where ground flora is nearly absent except for *Malvestrum sp., Cannabis sativa,* and *Gallium sp*. This vegetation group inhabits soils with rich organic matter and high soil moisture content. This habitat type represents low species diversity. *Broussonetia papyrifera* is considered the most problematic invasive species in northern Pakistan. Shakarparian and the foothills of the Himalayas are the most severely affected. It displays the typical symptoms of invasiveness with a fast growth rate, seed dispersal through birds, and vegetative propagation. First introduced in Islamabad to make the capital green, it propagated so fast that in less than 40 years it became a highly invasive species in the natural ecosystem of the Himalayan foothills. It has replaced the entire natural scrub forest vegetation around Rawal Lake and Shakarparian, and is now a growing threat to the natural vegetation of the reserve forest. Besides threatening the natural vegetation, it is also a human-health hazard. The Pakistan Medical Research Council (1995) reported that about 29% of allergy patients in Islamabad and Rawalpindi showed positive sensitivity to the pollen of *Broussonetia papyrifera*.

Exhibit 2.1: Map of MHNP Showing Spatial Distribution of Different Land-cover Classes



Legends

- Zone 1 Settlements
- Zone 2 Cultivated land
- Zone 3 Degraded land/cultivation/scattered settlements
- Zone 4 Subtropical forest at lower elevations- degraded
- Zone 5 Subtropical forest at higher elevation- degrade
- Zone 6 Invasive species Broussonetia papyrefera dominated vegetation
- Zone 7 Subtropical pine forest
- Zone 8 Subtropical semi-evergreen forest

3. Distribution of Plants of Medicinal and Economic Value

3.1 Zonal Classification

The following zonal classification introduced in **Section 2** was adopted to indicate the distribution of the plants of medicinal and economic value**:**

Zone 1: Settlements

Zone 2: Cultivated lands

Zone 3: Degraded land, cultivated land, and scattered settlements

Zone 4: Degraded forest at lower elevations

Zone 5: Degraded forest at higher elevations

Zone 6: Invasive species *Broussonettia papyrifera* dominated vegetation

Zone 7: Subtropical pine forest

Zone 8: Subtropical semi-evergreen forest

3.2 Species-wise Account of Plants of Medicinal and Economic Value

Species Name:	*Acacia modesta* Wall
Family:	Mimosaceae
Local Name:	Phulai
Blooming Period:	March–May
Occurrence:	Very common
Local Status:	Not vulnerable
Part Used:	Wood, leaves, and gum from the bark
Habitat and Distribution:	Grows in drier foothill tracts throughout the NWFP, the Punjab, and Balochistan from plains up to 900 m (Afghanistan, Pakistan, and India)
Habit:	Tree
Local Distribution:	Saidpur, Shahdra, Shah Allah Ditta, Rumli, Golra, and Subban

Dominant site: Behind Shah Faisal Mosque

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Acacia catechu

Family: Mimosaceae

Local Name: Khair

Blooming Period: May–August

Occurrence: Uncommon

Local Status: Vulnerable

Part Used: Bark and wood

Habitat and Distribution: Grows in the sub-Himalayan tracts up to 1,200 m (Pakistan, India, Sikkim, Assam, and Burma)

Habit: Tree

Local Distribution: Saidpur and Talhar

Dominant site: Along the Road from Marghazar Zoo to Talhar

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Acacia nilotica s.sp. indica (Benth.) Brenan

Family: Mimosaceae

Local Name: Kikar

Blooming Period: March–November

Occurrence: Common

Local Status: Not vulnerable

Part Used: Bark, gum, leaves, seeds, pods, and wood

Habitat and Distribution: One of the most common trees in the plains (Africa, Arabia, Pakistan, and India)

Habit: Tree

Local Distribution: Saidpur, Golra, and Shah Allah Ditta

Dominant site: Shah Allah Ditta

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Achyranthes aspera L.

Family: Amaranthaceae

Local Name: Puth kanta

Blooming Period: September–April

Occurrence: Uncommon

Local Status: Not vulnerable

Part Used: Whole plant

Habitat and Distribution: A very common weed found in landfills and on and roadsides

Habit: Annual or Perennial herb

Local Distribution: Saidpur, Golra, and Shah Allah Ditta

Abundant Population Site: Shah Allah Ditta

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Adiantum capillus-veneris L.

Family: Polypodiaceae

Local Name: Sumbul

Blooming Period: No flower

Occurrence: Common

Local Status: Not vulnerable

Part Used: Whole plant

Habitat and Distribution: Grows on the damp walls of wells, or near the seepage from springs

Habit: Annual herb

Local Distribution: Saidpur, Shahdra, Shah Allah Ditta, Rumli, Golra, and Subban

Abundant Population Site: Shahdra stream

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Albizzia lebbek (L.) Benthm

Family: Mimosaceae

Local Name: Siris

Blooming Period: March–May

Occurrence: Uncommon

Local Status: Not vulnerable

Part Used: Bark, seeds, flower, and pods

Habitat and Distribution: A naturalized species, it is widely cultivated as a roadside tree in Shakarparian, and Rawal Dam Lake

Habit: Tree

Local Distribution: Saidpur

Abundant Population Site: Saidpur (near Marghazar Zoo)

Zonal Distribution:	1 2 **3** **4** **5** **6** 7 8

Species Name:	Asparagus adscendens Roxb.
Family:	Asparagaceae
Local Name:	Musli
Blooming Period:	October–November
Occurrence:	Uncommon
Local Status:	Vulnerable
Part Used:	Rhizome
Habitat and Distribution:	Sub-Himalayan tract and outer Himlayas up to 1,500 m, common in the Punjab and lower Murree Hills.
Habit:	Shrub
Local Distribution:	Talhar, Gokkena Kalan, Gokkena Khurd, and Pir Sohawa
Abundant Population Site:	Along Talhar track
Zonal Distribution:	1 2 3 4 5 6 **7** 8

Species Name:	*Bauhinia variegate* L.
Family:	Caesalpinaceae
Local Name:	Kachnar
Blooming Period:	February–April
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Bark, flower buds, and roots
Habitat and Distribution:	Exists both cultivated and wild up to 1,000 m in the forests of the Himalayan foothills (Pakistan to Nepal, India, Burma, and China)
Habit:	Tree
Local Distribution:	Subban, Saidpur, Talhar, Gokeena, and Rumli
Abundant Population Site:	Along Talhar Track
Zonal Distribution:	**1** 2 3 4 5 **6** 7 **8**

Species Name:	Berberis lycium Royle
Family:	Berbeidaceae
Local Name:	Sumbal
Blooming Period:	March–June
Occurrence:	Uncommon

Local Status:	Vulnerable
Part Used:	Whole plant
Habitat and Distribution:	A forest species that occurs from 1,000-2,900 m (Pakistan, Kashmir to East Nepal)
Habit:	Shrub
Local Distribution:	Pir Sohawa, Gokeena, and Talhar (North facing slopes)
Abundant Population Site:	Chir Pine Forest

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name:	Bombax ceiba L
Family:	Bombacaceae
Local Name:	Simbal
Blooming Period:	December–March
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Roots, fruit, fluff of the capsule, and wood
Habitat and Distribution:	Is found at altitudes up to 1,400 m and is common in sub-Himalayan areas and lower valleys (Kashmir to Bhutan, and India and China)
Habit:	Tree
Local Distribution:	Rumli, Shahdra, and Pir Sohawa
Abundant Population Site:	Rumli Village (Scattered population)

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name:	Butea monosperma (Lam.) O.Kuntze
Family:	Papilionaceae
Local Name:	Dhak
Blooming Period:	March–April
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Whole plant
Habitat and Distribution:	Grows wildly from 600–900 m
Habit:	Tree
Local Distribution:	Rumli, Shahdra, and Saidpur
Abundant Population Site:	Rumli

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name:	Buxus papillosa C.K. Schm.
Family:	Buxaceae
Local Name:	Papri
Blooming Period:	March–May
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Wood, leaves, and bark
Habitat and Distribution:	Endemic to the drier foothill zones of Balochistan and the NWFP (600–3000 m), it is a gregarious species, and grows in shady rocky ravines at altitudes from 1,800–2,700 m
Habit:	Shrub
Local Distribution:	Rumli, Shahdra, Talhar, Saidpur, and Pirsohawa
Abundant Population Site:	Rumli
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Calotropis procera ssp. hamiltonii (Wight) Ali
Family:	Asclepiadaceae
Local Name:	Ak
Blooming Period:	All year around
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Whole plant
Habitat and Distribution:	Throughout Pakistan in warm, dry regions
Habit:	Shrub
Local Distribution:	Rumli, Shahdra, and Saidpur
Abundant Population Site:	Rumli
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Cannabis sativa L.
Family:	Cannabaceae
Local Name:	Bhang
Blooming Period:	April–October
Occurrence:	Abundant
Local Status:	Not vulnerable
Part Used:	Leaves and flowers
Habitat and Distribution:	Probably native to Central Asia, it is cultivated throughout temperate and tropical regions, and grows

	in wastelands and at the edge of fields
Habit:	Annual herb
Local Distribution:	Rumli, Shahdra, and Saidpur
Abundant Population Site:	Disturbed forests and cultivated lands
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Carissa opaca Stapf ex Haines
Family:	Apocynaceae
Local Name:	Granda
Blooming Period:	April–June
Occurrence:	Abundant
Local Status:	Not vulnerable
Part Used:	Whole plant
Habitat and Distribution:	Dominant shrub up to 1,400 m (Pakistan, Kashmir, India, Burma, and Sri Lanka).
Habit:	Shrub
Local Distribution:	Rumli, Shahdra, Saidpur, Pir Sohawa, Shah Allah Ditta, Subban, Gokeena, and Talhar (throughout the MHNP).
Abundant Population Site:	Throughout the MHNP
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Cassia fistula L.
Family:	Caesalpinaceae
Local Name:	Kinjal
Blooming Period:	April–May
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Leaves, fruit, bark, seeds, and wood
Habitat and Distribution:	Cultivated (also grows wild) in forest shrubberies and on open hillsides (Pakistan, India, Burma, and Sri Lanka)
Habit:	Tree
Local Distribution:	Rumli, Shahdra, Saidpur, Talhar, and Shah Allah Ditta
Abundant Population Site:	Forests at lower elevations (disturbed & reserve)
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Cuscuta reflexa Roxb.
Family:	Cuscutaceae

Local Name: Zarbuti
Blooming Period: August–September
Occurrence: Common
Local Status: Not vulnerable
Part Used: Stem, fruit, and seeds
Habitat and Distribution: Sindh, Balochistan and the Punjab
Habit: Climbing herb
Local Distribution: Talhar, Gokeena, and Pir Sohawa
Abundant Population Site: Parasite common on Zizyphus species
Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Dalbergia sissoo Roxb. ex DC.
Family: Papilionaceae
Local Name: Tali
Blooming Period: March–April
Occurrence: Common
Local Status: Not vulnerable
Part Used: Leaves, roots, and wood
Habitat and Distribution: Exists wild up to 1,300 m, but is also cultivated
Habit: Tree
Local Distribution: Talhar, Gokeena, and Pir Sohawa
Abundant Population Site: Parasite common on Zizyphus species
Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Dioscorea deltoidea Wall.
Family: Dioscoraceae
Local Name: Kunj
Blooming Period: May–July
Occurrence: Uncommon
Local Status: Not vulnerable
Part Used: Tuber
Habitat and Distribution: Punjab Hills
Habit: Perennial climbing herb
Local Distribution: Pir Sohawa
Abundant Population Site: Above Pir Sohawa
Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name:	Dodonaea viscosa (L.) Jacq.
Family:	Sapindaceae
Local Name:	Sanatha
Blooming Period:	January–March
Occurrence:	Abundant
Local Status:	Not vulnerable
Part Used:	Leaves, bark, seeds, and wood
Habitat and Distribution:	Common in the sub-Himalayan tract and a dominant component of the Park, it grows mainly on exposed dry slopes up to 900 m
Habit:	Shrub
Local Distribution:	Rumli, Talhar, Gokeena, Pir Sohawa, Subban, and Shah Allah Ditta
Abundant Population Site:	Degraded forests
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Ficus bengalensis L.
Family:	Moraceae
Local Name:	Bohr
Blooming Period:	April–May
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Seeds, leaves, roots, juice, and bark
Habitat and Distribution:	Cultivated or self-sown, young plants sometimes grow on other trees and walls
Habit:	Tree
Local Distribution:	Rumli, Talhar, Gokeena, Pir Sohawa, Subban, Shah Allah Ditta, and Noor pur
Abundant Population Site:	Noor pur
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Ficus religiosa Linn.
Family:	Moraceae
Local Name:	Pipal
Blooming Period:	October–November
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Seeds, bark, fruit, and wood
Habitat and Distribution:	Grows wild in foothills, but is also planted in the

plains

Habit: Tree

Local Distribution: Rumli, Talhar, Gokeena, Pir Sohawa, Subban, Shah Allah Ditta, and Noor pur

Abundant Population Site: Rumli

Zonal Distribution:

1	2	3	4	5	6	7	8
■						■	

Species Name: Ficus virgata Wall. ex Roxb.

Family: Moraceae

Local Name: Phagwara

Blooming Period: May–November

Occurrence: Common

Local Status: Not vulnerable

Part Used: Fruit and leaves

Habitat and Distribution: Common in plains and upto 2,100 m elevation (East Africa, Arabian peninsula, South Iran, North West Afghanistan, Pakistan, Kashmir, Nepal and India).

Habit: Tree

Local Distribution: Rumli, Talhar, Gokeena, Pir Sohawa, Subban, Shah Allah Ditta, and Noor pur

Abundant Population Site: Pir Sohawa

Zonal Distribution:

1	2	3	4	5	6	7	8
		■	■				

Species Name: Flacourtia indica (Burm.) Merr.

Family: Flacourtiaceae

Local Name: Kakoh

Blooming Period: March–April

Occurrence: Uncommon

Local Status: Not vulnerable

Part Used: Fruit and gum

Habitat and Distribution: Sub-Himalayan zone from 600–1,000 m

Habit: Tree

Local Distribution: Rumli, Talhar, Gokeena, Subban, Shah Allah Ditta, and Noor pur

Abundant Population Site: Subban

Zonal Distribution:

1	2	3	4	5	6	7	8
			■				■

Species Name: Grewia optiva Drum. Ex Burret

Family:	Tiliaceae
Local Name:	Dhman
Blooming Period:	April–September
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Leaves, shoots, bark, fruit, and wood
Habitat and Distribution:	Sub-Himalayan tract from Pakistan eastward to Nepal
Habit:	Tree
Local Distribution:	Rumli, Talhar, Gokeena, Subban, Noor pur, and Shahdara
Abundant Population Site:	Rumli
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Jasminum humile L.
Family:	Oleaceae
Local Name:	Peeli chumbelli
Blooming Period:	April–June
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Flower, roots, and juice
Habitat and Distribution:	Associated with Quercus leuchotrichophora, grows at 1,600–2,700 m (Central Asia, Afghanistan, Pakistan, Kashmir to West China, and India)
Habit:	Shrub
Local Distribution:	Gokeena and Pirsohawa
Abundant Population Site:	Pirsohawa
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Jasminum officinale L.
Family:	Oleaceae
Local Name:	Chambeli
Blooming Period:	July–October
Occurrence:	Uncommon
Local Status:	Not vulnerable
Part Used:	Whole plant
Habitat and Distribution:	Found at elevations of 1,600–2,700 m, and on more open slopes than J. humile; aform of this (J. grandiflorum) is the national flower of Pakistan

(South Europe, Central Asia, Afghanistan, Pakistan, Kashmir to Nepal, Tibet, and West China)

Habit: Shrub

Local Distribution: Rumli, Talhar, Gokeena, Subban, and Shadara

Abundant Population Site: Shahdara

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Justicia adhatoda L.

Family: Acanthaceae

Local Name: Bhaiker

Blooming Period: Throughout the year

Occurrence: Abundant

Local Status: Not vulnerable

Part Used: Leaves, flowers, roots, and stem (wood)

Habitat and Distribution: Very common in the foothills zone up to 1,200 m in waste lands (Pakistan, Kashmir to west Nepal, India, Indo-China, and Malaya)

Habit: Shrub

Local Distribution: Rumli, Talhar, Gokeena, Pir Sohawa, Subban, and Shah Allah Ditta

Abundant Population Site: Degraded forests

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Lantana camara L.

Family: Verbenaceae

Local Name: Panch phuli

Blooming Period: Whole year

Occurrence: Abundant

Local Status: Not vulnerable

Part Used: Whole plant

Habitat and Distribution: A native of tropical America, it is widely naturalized, and is considered an invasive pest in the Park area

Habit: Shrub

Local Distribution: Rumli, Talhar, Gokeena, Subban, Shah Allah Ditta, and Bara kahu

Abundant Population Site: Degraded forests

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name:	Lannea coromandelica (Houtt.) Merrill
Family:	Anacardiaceae
Local Name:	Kamlai, Kamla
Blooming Period:	March–April
Occurrence:	Very Common
Local Status:	Not vulnerable
Part Used:	Bark, leaves, and gum
Habitat and Distribution:	Found in the sub-Himalayan tracts up to 1,300 m (Pakistan, Kashmir to Bhutan, Assam, Burma, China, Indo-China, Sri Lanka, Andaman Islands, and Malaysia)
Habit:	Tree
Local Distribution:	Rumli, Talhar, Gokeena, Subban, Shah Allah Ditta, and Bara kahu
Abundant Population Site:	Degraded forests
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Lantana indica Roxb.
Family:	Verbenaceae
Local Name:	Ghaneri
Blooming Period:	Throughout the year
Occurrence:	Uncommon
Local Status:	Not vulnerable
Part Used:	Leaves
Habitat and Distribution:	Common in the foothills zone up to 900 m (Pakistan, India, and Thailand)
Habit:	Shrub
Local Distribution:	Talhar and Gokeena,
Abundant Population Site:	Reserve Forest
Zonal Distribution:	1 2 3 4 5 6 7 8

Species Name:	Mallotus philippensis (Lam.) Muell.-Arg
Family:	Euphorbiaceae
Local Name:	Kamila
Blooming Period:	September–November
Occurrence:	Common
Local Status:	Not vulnerable

Part Used: Glands and hairs on fruit

Habitat and Distribution: Common in the foothills up to 1,200 m (Pakistan, Kashmir to Nepal, India, Sri Lanka, Indo-China, Malaysia, Australia, and Polynesia)

Habit: Tree

Local Distribution: Rumli, Talhar, Gokeena, Subban, Shah Allah Ditta, Shahdara, and Noorpur

Abundant Population Site: Noorpur

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Maytenus royleanus (Wall. ex Lawson) Cufodont

Family: Celastraceae

Local Name: Pattaki

Blooming Period: March–October

Occurrence: Common

Local Status: Not vulnerable

Part Used: Seeds and stem

Habitat and Distribution: Common on hot, dry slopes around the Salt Range and sub-Himalayan tracts up to 1,500 m (Afghanistan, Pakistan, and India)

Habit: Shrub

Local Distribution: Rumli, Talhar, Gokeena, Subban, Shah Allah Ditta, and Shahdara

Abundant Population Site: Scattered

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Melia azedarach Linn.

Family: Meliaceae

Local Name: Drek

Blooming Period: March–April

Occurrence: Common

Local Status: Not vulnerable

Part Used: All parts

Habitat and Distribution: Cultivated and naturalized throughout Pakistan

Habit: Tree

Local Distribution: Rumli, Gokeena, Subban, and Shah Allah Ditta

Abundant Population Site: Scattered

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name:	Mimosa rubicaulis Lam. subsp himalayana (Gambel) Ohashi
Family:	Mimosaceae
Local Name:	Ral
Blooming Period:	July–August
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Whole plant
Habitat and Distribution:	Found in the sub-Himalayan tracts, especially the Margalla Hills and the adjoining plains from 550–1,200 m (Afghanistan, Pakistan, India, and Kashmir to Bhutan)
Habit:	Shrub
Local Distribution:	Talhar and Gokeena
Abundant Population Site:	Scattered
Zonal Distribution:	1 2 3 4 5 6 **7** **8**

Species Name:	Morus alba Linn
Family:	Moraceae
Local Name:	Chitta Tut
Blooming Period:	March–April
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Leaves, stem, bark, and fruit
Habitat and Distribution:	Cultivated in the NWFP, the Punjab and Balochistan
Habit:	Tree
Local Distribution:	Rumli, Talhar, Gokeena, Subban, Shah Allah Ditta, and Shahdara
Abundant Population Site:	Scattered
Zonal Distribution:	**1** **2** **3** 4 5 6 7 8

Species Name:	Myrisine africana L.
Family:	Myrisinaceae
Local Name:	Gokhan
Blooming Period:	March–May
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Seeds

Habitat and Distribution: Found in the sub-Himalayan tracts, around the Salt Range, and northern Balochistan, it is gregarious from 900–2,500 m (Africa, Arabia, Pakistan, Afghanistan, Kashmir to Nepal, Tibet, China, and Taiwan)

Habit: Shrub

Local Distribution: Rumli, Talhar, Gokeena, Subban, and Shahdara

Abundant Population Site: Scattered

Zonal Distribution:

1	2	3	4	5	6	7	8
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Species Name: Nannorhops ritcheana (Griff.) Aitchison.

Family: Palmeae

Local Name: Chatai pam

Blooming Period: July–November

Occurrence: Rare

Local Status: Vulnerable

Part Used: Leaves

Habitat and Distribution: Hot dry mountainous areas up to 1,800 m (Sindh Kohistan, lower Balochistan up to Kurram valley, South Iran, Afghanistan, and Pakistan)

Habit: Shrub

Local Distribution: Subban, Shah Allah Ditta, and Shahdara

Abundant Population Site: Shah Allah Ditta (Rare and vulnerable)

Zonal Distribution:

1	2	3	4	5	6	7	8
			■				■

Species Name: Nerium indicum Miller

Family: Apocynaceae

Local Name: Kanair

Blooming Period: April–October

Occurrence: Common

Local Status: Not vulnerable

Part Used: Whole plant

Habitat and Distribution: Widespread in streambeds in the lower hills up to 1,600 m throughout the country, and occasionally cultivated (Mediterranean, Iran, Pakistan, Afghanistan, Kashmir-Nepal, India, China, and Japan).

Habit: Shrub

Local Distribution: Rumli, Gokeena, Subban, Shah Allah Ditta, and Shahdara

Abundant Population Site: Rumli (Scattered)

Zonal Distribution:

1	2	3	4	5	6	7	8
		■	■				

Species Name: Olea ferruginea Royle

Family: Oleaceae

Local Name: Kahu

Blooming Period: April–May

Occurrence: Common

Local Status: Not vulnerable

Part Used: Fruit, leaves, bark, and wood

Habitat and Distribution: Very common forming climax with Acacia modesta in the warmer foothills tracts from 450–2,000 m in the NWFP, North Punjab, Afghanistan, and Kashmir to Nepal.

Habit: Tree

Local Distribution: Rumli, Gokeena, Subban, Shah Allah Ditta, Shahdara, and Barakahu

Abundant Population Site: Barakahu

Zonal Distribution:

1	2	3	4	5	6	7	8
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Species Name: Opuntia monoacantha (Willd.) Ham.

Family: Cactaceae

Local Name: Naghphani

Blooming Period: April–May

Occurrence: Common

Local Status: Not vulnerable

Part Used: Whole plant

Habitat and Distribution: Naturalized in the plains up to 1,200 m (Brazil and Argentina)

Habit: Shrub

Local Distribution: Rumli, Subban, Shah Allah Ditta, Shahdara, and Barakahu

Abundant Population Site: Shah Allah Ditta

Zonal Distribution:

1	2	3	4	5	6	7	8
		■	■				■

Species Name: Otostegia limbata (Benth.)Boiss.

Family: Lamiaceae

Local Name: Chitti booti

Blooming Period: May–June

Occurrence: Common

Local Status: Not vulnerable

Part Used: Leaves

Habitat and Distribution: Dry places in the plains and lower hills up to 1,000 m especially in the Punjab, around the Salt Range, the NWFP, and Kashmir.

Habit: Shrub

Local Distribution: Rumli, Subban, Shah Allah Ditta, Shahdara, and Talhar

Abundant Population Site: Shah Allah Ditta

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Phoenix sylvestris (L.) Roxb.

Family: Palmeae

Local Name: Khajoor

Blooming Period: September–October

Occurrence: Common

Local Status: Not vulnerable

Part Used: Fruit, juice of tree, roots, and kernel

Habitat and Distribution: Quite conspicuous in the Salt Range and around Taxila, it grows in the plains and up to altitudes of 1,000 m; it is native to Pakistan and is cultivated and self-sown

Habit: Tree

Local Distribution: Rumli, Subban, Shah Allah Ditta, Shahdara, and Talhar

Abundant Population Site: Shah Allah Ditta

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Phyllanthus embelica L.

Family: Euphorbiaceae

Local Name: Amla

Blooming Period: March–May

Occurrence: Common

Local Status: Not vulnerable

Part Used: Fruits, leaves, bark, roots, seeds, and flower

Habitat and Distribution: Fairly common and wild in sub-Himalayan tracts, it is cultivated in the plains from 900–1,000 m (Pakistan, Kashmir to Nepal, Assam, North

Burma, South China, Indo-China, and Malaysia)

Habit: Tree

Local Distribution: Rumli, Subban, Shah Allah Ditta, Shahdara, Talhar, and Noorpur

Abundant Population Site: Noor pur

Zonal Distribution:

1	2	3	4	5	6	7	8
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Species Name: Pinus roxburghii Sargent

Family: Pinaceae

Local Name: Chir

Blooming Period: January–March

Occurrence: Common

Local Status: Not vulnerable

Part Used: Leaves, bark, resin, seeds, and wood

Habitat and Distribution: It is common from 600–1,800 m, forming pure stands or mixed with blue Pine

Habit: Tree

Local Distribution: Talhar, Pir Sohawa, and Gokeena

Abundant Population Site: Pir Sohawa

Zonal Distribution:

1	2	3	4	5	6	7	8
				■		■	

Species Name: Pistacia chinensis Bunge

Family: Anacardiaceae

Local Name: Kangar

Blooming Period: March–April

Occurrence: Very common

Local Status: Not vulnerable

Part Used: Galls

Habitat and Distribution: Found both cultivated in plains and wild in sub-Himalayan tracts from 400–1,900 m (Afghanistan, Pakistan, and Kashmir to West Nepal)

Habit: Tree

Local Distribution: Pir Sohawa, Talhar, and Said pur

Abundant Population Site: Said pur

Zonal Distribution:

1	2	3	4	5	6	7	8
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Species Name:	Plantago major Linn.
Family:	Plantaginaceae
Local Name:	Ispaghul (Urdu)
Blooming Period:	March–May
Occurrence:	Uncommon
Local Status:	Not Vulnerable
Part Used:	Seeds, leaves, and roots
Habitat and Distribution:	Throughout Pakistan except Sindh
Habit:	Perennial herb
Local Distribution:	Gokeena
Abundant Population Site:	Gokeena (Scattered)
Zonal Distribution:	1 2 3 4 5 6 7 **8**

Species Name:	Punica granatum L.
Family:	Punicaceae
Local Name:	Anar
Blooming Period:	September–December
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Fruit, roots, bark, rind of fruit, seeds, and flower buds
Habitat and Distribution:	Widely cultivated (also exists wild) in sub-Himalayan tracts and hills up to 2,100 m (South Europe, Central, and West Asia)
Habit:	Shrub or small tree
Local Distribution:	Gokeena, Rumli, Subban, Shah Allah Ditta, Shahdara, and Talhar
Abundant Population Site:	Gokeena
Zonal Distribution:	1 2 **3** **4** 5 6 **7** **8**

Species Name:	Pyrus pashia Buch.-Ham ex D. Don
Family:	Rosaceae
Local Name:	Batangi
Blooming Period:	March–April
Occurrence:	Common
Local Status:	Not vulnerable
Part Used:	Fruit, leaves, and wood
Habitat and Distribution:	Both cultivated and wild, it is widespread in in the Murree Hills tracts in spring (Pakistan,

	Afghanistan, Kashmir to South West China, and Burma)
Habit:	Tree
Local Distribution:	Gokeena, Rumli, Subban, Shah Allah Ditta, Shahdara, Talhar,
Abundant Population Site:	Gokeena
Zonal Distribution:	1 2 3 4 5 6 **7** **8**

Species Name:	Quercus luecotrichophora A. Camus
Family:	Fagaceae
Local Name:	Rein
Blooming Period:	April–May
Occurrence:	Uncommon
Local Status:	Not vulnerable
Part Used:	Stem, wood, and acorns
Habitat and Distribution:	Common and gregarious in the sub-Himalayan tracts from 700–2,000 m (Pakistan, Kashmir-Nepal, and Upper Burma)
Habit:	Tree
Local Distribution:	Pir Sohawa, and Talhar
Abundant Population Site:	Pir Sohawa
Zonal Distribution:	1 2 3 4 5 6 **7** 8

Species Name:	Ricinus communis Linn.
Family:	Euphorbiaceae
Local Name:	Arand
Blooming Period:	Throughout the year
Occurrence:	Very common
Local Status:	Not vulnerable
Part Used:	Seeds, leaves, bark, and roots
Habitat and Distribution:	Cultivated and self-sown, it prefers sandy soils along streambeds and river beds, but also grows in dry places
Habit:	Shrub or a small tree
Local Distribution:	Subban, Shah Allah Ditta, Shahdara, and Noor pur
Abundant Population Site:	Said pur
Zonal Distribution:	1 2 **3** **4** 5 6 7 8

Species Name: Rosa brunonii Lindl.

Family: Rosaceae

Local Name: Turni

Blooming Period: April–June

Occurrence: Fairly common

Local Status: Not vulnerable

Part Used: Whole plant

Habitat and Distribution: This floriferous climber decorates the whole Murree Hills Range in Spring from 900–2,300 m (Pakistan, Kashmir to Nepal, Assam, Burma, and West China)

Habit: Climber

Local Distribution: Gokeena, Pir Sohawa, and Talhar,

Abundant Population Site: Pir Sohawa

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Rubus ellipticus Smith.

Family: Rosaceae

Local Name: Not Known

Blooming Period: February–April

Occurrence: Fairly common

Local Status: Fairly common

Part Used: Fruit, leaves, and roots

Habitat and Distribution: Common in sub-Himalayan tracts especially in the Pinus roxburghii zone from 900–1,800 m (Pakistan, Kashmir-South West China, South India, Sri Lanka, and the Philippines)

Habit: Shrub

Local Distribution: Gokeena, Pir Sohawa, and Talhar

Abundant Population Site: Pir Sohawa

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Smilax aspera Linn.

Family: Smilacaceae

Local Name: Chob Cheeni

Blooming Period: September–November

Occurrence: Uncommon

Local Status: Not vulnerable

Part Used: Roots

Habitat and Distribution: Common up to 2,000 m

Habit: Climbing Shrub

Local Distribution: Gokeena, Pirsohawa, and Talhar

Abundant Population Site: Pirsohawa

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Terminalia arjuna Wight & Arn.

Family: Combretaceae

Local Name: Arjun

Blooming Period: April–May

Occurrence: Uncommon

Local Status: Not vulnerable

Part Used: Bark, fruit, and leaves

Habitat and Distribution: Indigenous to Central India, it is usually cultivated in gardens

Habit: Tree

Local Distribution: Gokeena, Pir Sohawa, and Talhar,

Abundant Population Site: Pir Sohawa

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Viola canescens Wall. ex Roxb.

Family: Violaceae

Local Name: Banafsha

Blooming Period: March–May

Occurrence: Fairly common

Local Status: Vulnerable

Part Used: Whole plant

Habitat and Distribution: A forest species found on shady banks it grows at elevations from 950–2,600 m in the Himalayas (Pakistan, and Kashmir to Nepal)

Habit: Annual herb

Local Distribution: Gokeena, Pir Sohawa, and Talhar,

Abundant Population Site: Pir Sohawa

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Vitex negundo L.

Family:	Verbenaceae
Local Name:	Banua/Bana
Blooming Period:	March–June
Occurrence:	Fairly common
Local Status:	Not vulnerable
Part Used:	Leaves, roots, and fruit
Habitat and Distribution:	Cultivated , it grows in the plains and up to elevations of 1,600 m mainly in the sub-Himalayan zone (North Africa, Pakistan, and India)
Habit:	Shrub
Local Distribution:	Gokeena, Rumli, Subban, and Shahdara
Abundant Population Site:	Rumli

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name:	Withania somnifera (L.) Dunal.
Family:	Solanaceae
Local Name:	Aksan
Blooming Period:	All year around
Occurrence:	Uncommon
Local Status:	Not vulnerable
Part Used:	Whole plant
Habitat and Distribution:	It is a common herb in waste lands up to 2,300 m (Canary Islands, Africa, the Mediterranean, Arabia, Iraq, South Iran, Syria, Turkey, Palestine, Pakistan, and India)
Habit:	Perennial herb
Local Distribution:	Shahdara and Said pur
Abundant Population Site:	Saidpur

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name:	Woodfordia fruticosa (L.) S. Kurz
Family:	Lythraceae
Local Name:	Dhawi
Blooming Period:	April–May
Occurrence:	Common
Local Status:	Not vulnerable

Part Used: Flowers and leaves

Habitat and Distribution: Common in the sub-Himalayan tract, it often grows on cliffs at elevations of 600-1,200 m(Tropical Africa, Sri Lanka east to China)

Habit: Shrub

Local Distribution: Talhar, Gokeena, Rumli, Subban, and Shahdara

Abundant Population Site: Talhar

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Zanthoxylum armatum DC.

Family: Rutaceae

Local Name: Timber

Blooming Period: March–April

Occurrence: Common

Local Status: Not vulnerable

Part Used: Bark, fruit, stem, and seeds

Habitat and Distribution: Found in the sub-Himalayan tracts from 600–1,700 m (Pakistan [Hazara, Abbottabad, and Rawalpindi], Kashmir, South West China, Taiwan, and the Philippines)

Habit: Shrub

Local Distribution: Pir Sohawa, Gokeena, Rumli, Subban, and Shahdara

Abundant Population Site: Pir Sohawa

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Zizyphus mauritiana var. spontanes (Edgew) R. R. Stewart ex Qaiser & Nazim.

Family: Rhamnaceae

Local Name: Ber, Beri

Blooming Period: July–September

Occurrence: Common

Local Status: Not vulnerable

Part Used: Fruit, leaves, roots, and bark

Habitat and Distribution: Cultivated and self-sown in India, Pakistan [Sindh, Punjab, and the NWFP], and the sub-Himalayan tracts

Habit: Tree or large shrub

Local Distribution: Shahdara and Said pur

Abundant Population Site: Shah Allah Ditta

Zonal Distribution:

1	2	3	4	5	6	7	8

Species Name: Zizyphus nummularia (Burm. f) W. & A.

Family: Rhamnaceae

Local Name: Jher beri, Mala

Blooming Period: March–June

Occurrence: Common

Local Status: Not vulnerable

Part Used: Leaves, fruit, and roots

Habitat and Distribution: Common throughout Pakistan in dry regions (Palestine, Iraq, Iran, Afghanistan, Pakistan, and India)

Habit: Shrub

Local Distribution: Shahdara and Said pur

Abundant Population Site: Shah Allah Ditta

Zonal Distribution:

1	2	3	4	5	6	7	8

4. Mammals of Margalla Hills Range

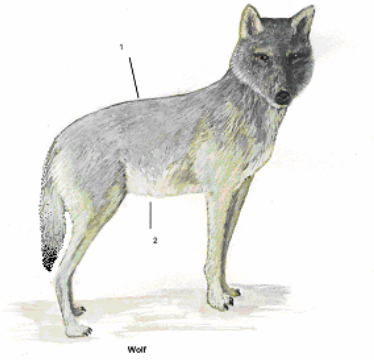
Roberts (1997) gives a detailed account of the mammals of Pakistan. This baseline study contains a comprehensive list of the mammals of the MHNP. Scientific names, common English names, local names, status in the hill range, feeding habits, and activity patterns of large and small mammals are shown (**Exhibit 4.1-4.2.** Their distribution and relative abundance is given in (**Exhibit 4.3-4.4**). Relative abundance of the large mammals in various habitat types is given (**Exhibit 4.5**).

4.1 Large Mammals of the Margalla Hills

Asiatic Jackal *Canis aureus*

It is a very common nocturnal scavenger—though it feed on rodents as well—of Islamabad, living mostly in thickets in the valleys of the Margalla Hills.

Indian Wolf *Canis lupus*



This is a wandering animal and does not usually stay in one place unless it is breeding. Human communities consider it an enemy species and treat it as such. It has become quite rare as a result. It however, is occasionally seen in the western part of the Margalla Hills. The Urial constituted a major portion of the Indian Wolf's diet, but is now extinct in the Margalla Hills.

Wild Boar *Sus scrofa*

This animal has increased in the valleys of the Margalla Hills because of the good shelter available. It finds food in the green belts of nearby Islamabad and on the slopes of deep seasonal streams where refuse is thrown. It is a fast breeding animal with virtually no predators apart from leopards occasionally in winter.

Jungle Cat *Felis chaus*

It is a nocturnal animal commonly found here. It is considerably larger than the domestic cat, It readily climbs trees to look for night roosting birds or their nests. It eats rodents, but may also attack poorly secured poultry.

Small Kashmir Flying Squirrel *Hylopetes fimbriatus*

The Small Kashmir Flying Squirrel is believed to exist in the higher areas of the Chir Pine zone. Gnawed green pine cones collected from a patch of forest in the eastern part of the Margalla Hills Range serve as evidence of its existence there.

Indian Crested Porcupine *Hystrix indica*

This is nocturnal and common. Its body is covered with long spines, wich are erected when the animal is attacked. These spines are even effective against leopard attack. It digs through soil for tubers, and peels the bark of young trees. It is therefore, considered harmful for trees and agriculture. It makes dens for daytime rest and breeding.

Indian Hare *Lepus nigricolis*

It is commonly found in the vicinity of agricultural areas and in the valleys of the hill range. It shelters during the day in thickets and bushes. Major predators include jungle cats, foxes, and captive hounds.

Rhesus Monkey *Macaca mullata*

This has increased significantly due to legal protection in the National Park, and the fact that the monkeys are fed regularly by people on road sides. They are preyed upon by leopards in winter, Palm Civets, Yellow-throated Martens, and occasionally jungle cats. They are intelligent and have stereoscopic vision. They are arboreal animals and have opposable thumbs. An interesting trait found in these monkeys is that they store food in their cheek pouches until they can find a suitably secure location to chew it.

Grey Goral *Naemorhedus goral*

It is mostly found on vertical cliffs in the central part of the Park. They are active at sunrise and in the evening. With the improvement in habitat conditions in the center of the Park, twin births have become quite common. However, their habitats are grazed upon by domestic livestock in the eastern flank, so single births are more common. It is possible that their populations will spread all over the cliff areas of Margalla range if habitat conditions improve, and if domestic livestock and fire hazards are controlled.

Barking Deer *Muntiacus muntjak*

It occurs in several valleys of the Margalla Range, particularly in the central southern part. Unlike other deer, it lacks antlers. Instead, it uses its well-developed canines to express dominance over other males. It is a territorial animal and defends its territory vehemently from other males. Its name comes from the fact that it makes barking calls during the breeding season. Its major predator is the leopard in winter. Dispersal of the deer over the entire range is possible if potential habitats are saved.

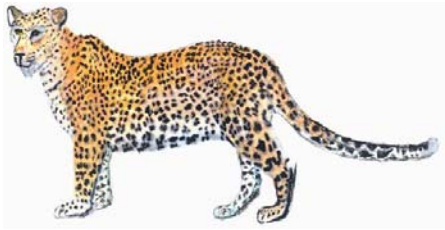
Palm Civet *Paguma larvata*

It is a nocturnal animal common in the central and eastern parts of the Margalla Hills. It is extremely agile and can climb trees and rocks, and swim as well. An expert hunter, it usually hunts small mammals but can survive on fruit as well. It breeds in dens bushy valleys and slopes.

Yellow-Throated Marten *Martes flavigula*

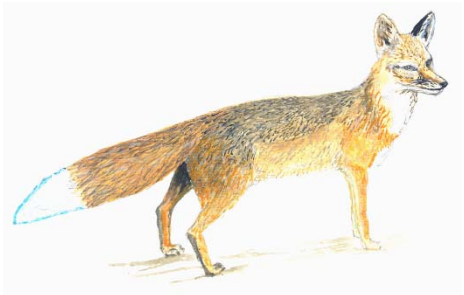
This is rare, but has been spotted by the author in the central part of the Park. It has been observed to climb down trees headfirst like a squirrel. Apart from being very agile, it can swim as well. It hunts rodents, birds, lizards, and snakes.

Panther or Leopard *Panthera pardus*



It is generally only seen in the Park in winter. It preys upon wild boar at night, and monkeys in the mornings and evenings. Barking deer and Goral are also frequent prey. Domestic livestock that strays into the park is also a frequent target. Leopards have been known to kill gazelles in their enclosures in Marghazar Zoo. Unfortunately, their presence in the Park is not tolerated by the Park administration. Officials killed a leopard in 1982 in the Park and trapped another in 2006.

Common Red Fox *Vulpes vulpes*



It is common through out the Park. It eats about one kilogram of meat per day in captivity, so it is assumed to play a significant role in controlling rodent populations in the wild.

Small Indian Civet *Vivericula indica*

It is a small nocturnal animal seen in the eastern flank of the Park. It is very agile and an expert hunter. It also eats fallen ripe and over ripe fruits.

4.2 Small Mammals of the Margalla Hills

Indian Musk Shrew *Suncus murinus*

This animal is little bigger than a mouse that feeds mainly on insects, small reptiles and small rodents. It has pinhead eyes and so very weak vision. It does however, have a keen sense of smell. Being an aggressive predator it does not hesitate in attacking a prey bigger than itself.

Long-Eared Hedgehog *Hemiechinus collaris*

This small mammal is found in scrub areas in the summer. During the winters it hibernates. It eats mainly insects, but also plays a role in controlling the population of lizards, snakes, and rodents.

Fulvous Fruit Bat *Rousettus leschenaultii*

It is a medium sized bat, with a long muzzle that aids its sense of smell, and large eyes for nocturnal vision. It is a migratory species, visiting the Margalla Hills in the summer. It is also known to carry fruit long distances in its mouth, thus helping the dispersal of seeds.

Large Fruit Bat *Pteropus giganteus*

This roosts in the daytime on trees at the foot of the Margalla Hills on the southern side. Its acute sense of smell helps it locate ripe figs and other fruits at night when they fly out over the Park and various agricultural areas.

Common Serotine Bat *Eptesicus serotinus*

This is a small bat that is known to often eat its own weight in insects every night. It has pinhead eyes and therefore weak vision, but it has echolocation capability and emits ultrasonic sounds, which are echoed back to its ears. This allows it to catch mosquitoes and other flying insects in the dark.

Dark Whiskered Bat *Myotis muricola*

It is a small, dark bat with a medium length muzzle and pointed ears that lives in holes and crevices in rock formations. Its wing membrane, which is also between its hind legs, completely encloses its tail. It is a moist temperate forest species, also found here. Known for its swiftness in flight maneuvers, it catches insects after dark playingan important role in controlling insect populations.

Indian False Vampire *Megaderma lyra*

This is a gray colored, large-eared bat with a big head, and large leaf nose. It has no tail. It is gregarious in its roosting habits in the daytime. Although mainly an insect eater, it also catches lizards and small birds.

Common Yellow Bellied Bat *Scotophilus healthii*

As the name implies, its body is of is yellow in color. It is found in the Margalla Hills in the summer. Being a fairly rare species, roosting sites have not yet been discovered in the Margalla Hills.

Common Rat *Rattus rattus*

It is a common nuisance found commonly in houses. It is a known disease spreader, carrying fleas and the deadly salmonella.

Indian Gerbil *Tatera indica*

It burrows into dry grounds, and is an important component of the food chain. It is not very common in the Margalla Hills.

Large Grey Mongoose *Herpestes edwardsi*

It is relatively common diurnal predator of the Margalla Hills. It plays a vital role in controlling diurnal rodents and snakes. Most rodents are caught in the mornings and evenings. It also poses a potential threat to ground nesting birds in the park.

Small Indian Mongoose *Herpestes javanicus*

It is less common than the Large Grey Mongoose. It is found in dry areas at lower altitudes. It is also diurnal hunter of rodents, snakes, ground birds' nests, and insects.

Scaly Anteater *Manis crassicaudata*

This is commonly found at the foot of the Margalla Range. It is a nocturnal termite and ant eating mammal. It has long claws on its forefeet that are specially adapted for digging. It has broad scales on its body for defense against predators . Its tongue is long cylindrical and is sticky, making it easy to catch ants. The anteater has no teeth, so it swallows the ants directly. It has a muscular stomach that is adapted to crush food.

Palm Squirrel
Funambulus pennantii

It is a very rare diurnal arboreal mammal found in the extreme north of the Margalla Hills. It feeds mainly on fruits and seeds which are abundant in these hills. The second reason is that it is not adapted to living in higher elevations. Therefore, the Margalla Hills are at the edge of its extreme northern distribution.

Indian Mole Rat or Rice Rat
Bandicota bengalensis

The Indian Mole Rat is common in frequently irrigated agricultural fields. An important part of the food chain, it is preyed upon by the Dhaman or rat snake, the Spotted Owlet, and the Kestrel. The fact that it waits at the entrance of its burrow before venturing out makes it especially vulnerable to attack.

4.3 Mammmalian Diversity, Distribution and Relative Abundance in MHNP

Fourteen species of large mammals (**Exhibit 4.1**) and 17 species of small mammals (**Exhibit 4.2**) have been identified based on the fieldwork conducted for this baseline study, as well as previous studies done by the author. The distribution of different animals in different zones of the park is marked on a map (**Exhibits 4.3** and **2.1**).

4.4 Salient Characteristics of the Mammals of Margalla Hills Range

The subtropical semi-evergreen forest, Zone 8, is the largest zone of the Margalla Hills range and is home to a sizable number of large mammals, and therefore requires special conservation attention. Zones 1, 2, 3 are mainly inhabited by rodents. They are ecologically degraded and have human settlements and cultivations. The area needs to be improved with respect to land use. The valleys with thick vegetation in Zone 8 are home to the barking deer, wild pig, porcupine and jackal. The grey goral is found in the high cliffs of Zone 8.

The composition of mammalian fauna of the MHNP reflects a transition and overlapping between mountainous mammalian species, and the species of the southern plains. The Margalla Hills range is distributional limit towards north for many species of the southern plains viz., *Eptesicus serotinus, Manis crassicaudata, Hemiechinus collaris, Bandicota bengalensis, Funambulus pennantii, Felis chaus*, *Herpestes edwardsi, Herpestes javanicus, Pteropus giganteus,* Tatera indica, *Versicula indica* and Sus scrofa. Similarly, it limits distribution towards the south for many mountainous species viz. *Panthera pardus, Muntiacus muntjak, Naemorhedus goral, Macaca mulatta,* and *Hylopetes fimbriatus*.

Population of *Sus scrofa* (wild boar) has increased due to thick vegetative shelter, and due to easy access through the corridors of the *nullahs* traversing every sector to the garbage heaps in the adjoining urban areas.

The *Panthera pardus* (leopard) population has also increased in recent years in the Murree Hills Range and the Margalla Hills. The last six months have seen attacks on humans and livestock in the Murree Hills.

There has been a definite reduction in the population of the *Muntiacus muntjak* (barking deer). (Reasons cited include leopard attacks and increased poaching.

The *Naemorhedus goral* (Grey goral)inhibits the steep cliffs of the Margalla Hills. Its population has decreased as well possibly because of forest fires and poaching.

The *Canis lupus* (Indian Wolf) is known to live in the Margalla Hills, although there have been no recent sightings. The *Macaca mulatta* (rhesus monkey)has steadily increased in population to easily accessible shelter and the increased availability of food in the wild as well as from visiting people.

The ever increasing traffic on the central road of the Park and the consequential noise causes disturbance to the animals. Similarly, the roadside lights which are not switched off till midnight also play a part in restricting the movement of the animals.

Exhibit 4.1: Large Mammals of the Margalla Hills National Park Area

No.	Scientific Names	Common Names	Local Names	Park Status	Feeding Habits	Activity Pattern
1.	*Canis aureus*	Asiatic jackal	Gidar	Common	Carnivore	Nocturnal
2.	*Canis lupus*	Indian wolf	Bughiar	Rare	Carnivore	Nocturnal
3.	*Sus scrofa*	Wild boar	Soor	Common	Herbivore	Nocturnal
4.	*Felis chaus*	Jungle cat	Jungli billi	Less Common	Carnivore	Nocturnal
5.	*Hylopetes fimbriatus*	Small Kashmir flying squirrel	Choti uran gulehri	Common	Herbivore	Di-urnal
6.	*Hystrix indica*	Indian crested porcupine	Seh	Common	Herbivore	Nocturnal
7.	*Lepus nigricolis*	Indian hare	Khargoash	Common	Herbivore	Nocturnal
8.	*Macaca mulatta*	Rhesus monkey	Booja, bundar	Common	Herbivore	Di-urnal
9.	*Naemorhedus goral*	Grey goral	Raain or jungli bukri	Rare	Herbivore	Di-urnal
10.	*Muntiacus muntjak*	Barking deer	Kakkar	Rare	Herbivore	Di-urnal
11.	*Paguma larvata*	Himalayan masked palm civet	Mushki billi	Rare	Carnivore	Nocturnal
12.	*Panthera pardus*	Panther or leopard	Seehn, guldar	Rare	Carnivore	Nocturnal
13.	*Vulpes vulpes*	Common red fox	Langarhi or loomri	Common	Carnivore	Nocturnal
14.	*Vivericula indica*	Small Indian civet	Guldari billi	Common	Carnivore	Nocturnal

Exhibit 4.2: Small Mammals of the Margalla Hills National Park Area

No.	Scientific Names	Common Names	Local Names	Park Status	Feeding Habits	Activity Pattern
1.	*Bandicota bengalensis*	Indian Mole Rat or Rice Rat	Fusli chooha	Common	Grainivore	Nocturnal
2.	*Eptesicus serotinus*	Common Serotine	Chumgadar	Rare	Insectivore	Nocturnal
3.	*Funambulus pennantii*	Palm Squirrel	Gulehri	Common	Grainivore	Di-urnal
4.	*Herpestes edwardsi*	Common India Mongoose	Neola	Common	Carnivore	Di-urnal
5.	*Herpestes javanicus*	Small Indian mongoose	Neola	Common	Carnivore	Di-urnal
6.	*Hemiechinus collaris*	Long-eared hedgehog	Kundyara chooha	Less Common	Carnivore	Nocturnal
7.	*Manis crassicaudata*	Scaly anteater	Gorput	Common	Insectivore	Nocturnal
8.	*Mus musculus*	Common house mouse	Choohi	Common	Grainivore	Nocturnal
9.	*Myotis muricola*	Dark whiskered bat	Chumgadar	Less Common	Insectivore	Nocturnal
10.	*Eptesicus serotinus*	Common serotine	Chumgadar	Common	Insectivore	Nocturnal
11.	*Rousettus leschenaultii*	Fulvous fruit bat	Chamgadar	Rare	Fruitivorous	Nocturnal
12.	*Pteropus giganteus*	Indian flying fox	Chamgadar	Common	Fruitivorous	Nocturnal
13.	*Megaderma lyra*	Indian false vampire	Chamgadar	Rare	Insectivore	Nocturnal
14.	*Scotophilus healthii*	Common yellow bellied bat	Chumgadar	Common	Insectivore	Nocturnal
15.	*Rattus rattus*	Common rat	Chooha	Common	Grainivore	Insectivore
16.	*Tatera indica*	Indian gerbil	Chooha	Common	Grainivore	Insectivore
17.	*Suncus murinus*	Indian musk shrew	Chchundar	Common	Insectivore	Nocturnal

Exhibit 4.3: Distribution and Relative Abundance of the Large Mammals of MHNP

The relative abundance of the species was determined by applying the following formula:

$$\text{Relative Abundance} = \frac{\text{Number of species}}{\text{Total number of all species}}$$

No.	Scientific Name	Distribution								Total	Relative Abun-dance
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8		
1.	*Canis aureus*	0	0	14	40	28	107	42	145	376	0.234
2.	*Canis lupus*	0	0	0	0	0	0	0	2	2	0.001
3.	*Sus scrofa*	0	0	0	2	16	260	46	190	514	0.327
4.	*Felis chaus*	1	2	4	12	8	15	5	3	50	0.032
5.	*Hylopetes fimbriatus**	0	0	0	0	0	0	25	0	25	0.016
6.	*Hystrix indica*	0	0	3	15	13	25	8	35	99	0.063
7.	*Lepus nigricolis*	0	2	7	12	14	45	4	25	109	0.069
8.	*Macaca mulatta*	0	0	0	0	45	58	35	132	270	0.172
9.	*Naemorhedus goral*	0	0	0	0	0	0	5	3	8	0.005
10.	*Muntiacus muntjak*	0	0	0	0	3	15	10	25	53	0.034
11.	*Paguma larvata*	0	0	0	0	0	6	3	2	11	0.007
12.	*Panthera pardus*	0	0	0	0	0	0	1	1	2	0.001
13.	*Vulpes vulpes*	0	0	6	12	5	9	3	6	41	0.026
14.	*Vivericula indica*	0	0	2	0	0	5	1	1	9	0.005
	Total									**1,569**	

Zone 1: Settlements

Zone 2: Cultivated land

Zone 3: Degraded land/cultivation/scattered settlements

Zone 4: Subtropical forest at lower elevations- degraded

Zone 5: Subtropical forest at higher elevation- degrade

Zone 6: Invasive species *Broussonetia papyrefera* dominated vegetation

Zone 7: Subtropical pine forest

Zone 8: Subtropical semi-evergreen forest

Exhibit 4.4: Relative Abundance of the Large Mammals in MHNP

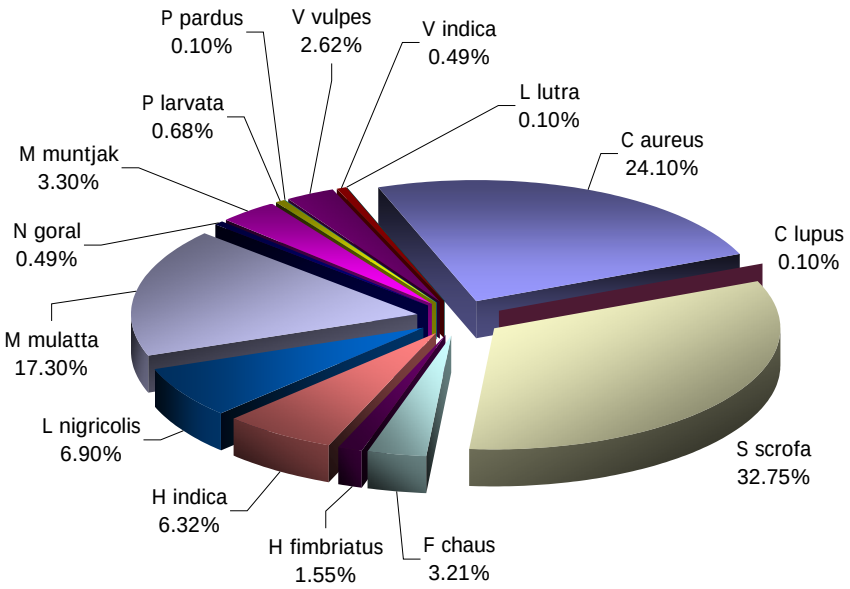


Exhibit 4.5: Distribution and Relative Abundance of the Small Mammals of MHNP

No.	Scientific Name	Distribution								Total	Relative Abun-dance
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8		
1.	*Bandicota bengalensis*	75	58	65	0	0	0	0	0	198	0.115
2.	*Eptesicus serotinus*	4	6	3	4	0	0	0	0	17	0.010
3.	*Funambulus pennantii*	54	34	25	12	10	6	16	8	165	0.096
4.	*Herpestes edwardsi*	15	19	25	5	7	9	8	8	96	0.056
5.	*Herpestes javanicus*	13	16	20	7	9	3	5	7	80	0.051
6.	*Hemiechinus collaris*	0	0	6	0	0	0	19	18	43	0.025
7.	*Manis crassicaudata*	5	17	8	2	0	0	0	0	32	0.018
8.	*Mus musculus*	56	67	45	7	8	12	9	8	212	0.123
9.	*Myotis muricola*	14	12	15	23	0	0	6	0	70	0.040
10.	*Eptesicus serotinus*	23	56	38	16	27	12	7	9	188	0.109
11.	*Rousettus leschenaultii*	6	2	4	0	0	0	0	0	12	0.007
12.	*Pteropus giganteus*	0	0	0	24	19	25	50	80	198	0.115
13.	*Megaderma lyra*	5	6	12	0	0	0	0	0	23	0.013
14.	*Scotophilus healthii*	23	25	14	12	0	0	13	8	95	0.055
15.	*Rattus rattus*	24	45	42	24	5	6	7	31	184	0.107
16.	*Tatera indica*	12	14	18	0	0	0	0	0	44	0.025
17.	*Suncus murinus*	14	19	27	0	0	0	0	0	60	0.035
	Total									**1,717**	

5.Birds of the Margalla Hills Range

5.1 Review of Literature

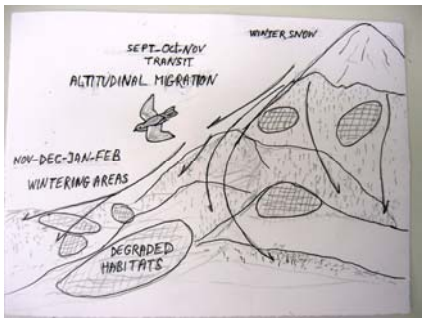
This Baseline records 218 bird species in the Margalla Hills Range within the MHNP. After the notification of the National Park, the birds found in the National Park, Islamabad and the Murree Hills were enlisted together by Corfield 1983. Mallalieu (1987) listed 312 birds species in and around Islamabad including Margallh Hills. Ward (1994) 339. any other bird watchers made unpublished checklists, which raised the recorded number to 400 species in and around Islamabad including the National park. Roberts (1991 and 1992) covers the bird species all over Pakistan including the Margalla Hills Range. Pyhala (1999) published 'Birds of Islamabad', which covered Islamabad and its immediate surroundings He counted 403 bird species. Bthere is no checklist of the birds of the MHNP as such.

5.2 Observations and Findings

These observations and findings are based on the field studies of the birds of the MHNP over the last twenty-five years, and from August 2004 to July 2005.

There are 218 species of birds in the Margalla Hills Range within the MHNP. Out of these, 82 are resident, 32 summer visiting and breeding species, 73 winter visitors, and 31 transit migrants mainly from and to the Himalayan heights. The birds of different zones are shown in **Exhibit 5.1-5.3**, while a complete list of birds found in the Park is given in **Appendix D**.

Autumn Altitudinal Migration



The Margalla Hills Range becomes richer in bird species when altitudinal bird migration takes place. Influxes of high altitude and migrants from northern latitudes arrive in Margalla Hills Range in autumn. More than 100 species join the 82 resident birds. As autumn passes and winter approaches, 31 species of these visitors migrate further south. However, over 150 species remain during the winter season.

Spring Altitudinal Migration

Migratory Himalayan birds begin to return to the MHNP when temperatures begin to rise in the plains after the winter months. A large number of species remain in the Margalla Hills in the winter till the Himalayan foothills begin to experience higher temperatures. The Himalayan birds lingering on in the Margalla Hills move up when the temperate zone of the Himalayan Range begins experiencing the change in the season from winter to spring. They ascend with spring to potential breeding areas in the Temperate and Alpine zones of higher mountains and valleys.

Latitudinal Migration of Summer Visitors

At least 32 bird species of the plains from lower latitudes appear in the Margalla Hills with the advent of spring. These birds join 82 local bird species and 104 wintering and transit migrant bird species still waiting for better weather in the upper regions. Residents and summer visitors look for breeding localities. The courtship calls of some birds start as early as at 3 o'clock in the morning. More birds start calling as the sky becomes pale just before dawn. By the time the sky is red in the east, hundreds of melodious bird calls can be heard in the valleys and ridges of the Margalla Hills. Many Passerine species have already had their first brood by the end of spring. Insectivorous birds or grainivorous birds collect protein-high insect larvae for their nestlings. The role of birds as insect population controllers becomes more apparent at this time of year. The season is also witness to highly prevalent mutualism; ecological linkages become prominent.

Latitudinal Migration of Winter Visitors

The birds migrate south with the arrival of cold weather in the northern latitudes even far beyond our northern boundary. The birds that visit Margalla Hills include raptors and even small Passerines like warblers. These go back to their breeding areas in the northern latitudes by the end of the spring season in the Margalla Hills.

Flagship Species of Birds:

The IUCN Red List specifies that birds occurring solely in the MHNP were to be considered important, and were designated as flagship species. These include the White-crested Kaleej Pheasant *(Kaleej Lophura leucomelana)*; the Peregrine or Shaheen Falcon *(Falco peregrinus)*; the Red-capped Falcon *(Falco pelegrinoides)*; the Fairy Pitta or Indian Pitta or Blue-winged *(Pitta Pitta brachyura)*; and the Tytler's or Slender-Billed Leaf Warbler *(Phylloscopus tytleri)*.

White-crested Kaleej Pheasant
Lophura leucomelana

The white-crested Kaleej Pheasant is known to live in the Margalla Hills, the Murree foothills, the lower Kaghan valley and the lower Neelum valley. It is found in thick undergrowth with some open areas in or around, in the sub-tropical pine forest eco-zone and also in the tropical deciduous forest eco-zone. This type of habitat is fast shrinking in these eco-zones and has resulted in a great decline in the population of this bird.

Wood Pigeon or Cushat
Columba palumbus

The distribution of the Wood Pigeon is quite wide—the western mountains, some mountains of the Northern Areas, the Salt Range and the Kala Chitta Range—, yet its population is surprising low. It is a shy species and avoids human settlements. It is a large bird and hunters do not hesitate shooting it down in large numbers. It visits the Margalla Hills in very small

numbers and eats *Ziziphus* and *Ficus* species and other wild ripe fruits.

Sirkeer Cuckoo *Taccocua leschenaultii*

The Sirkeer Cuckoo is quite rare in Pakistan. It is very shy and therefore difficult to spot. It is found in habitats with sufficient undergrowth and minimal disturbance. In addition to its occurrence in the Margalla Hills, it is found in the south-eastern Murree foothills, in some places in Sindh along the Indus River, and south-eastern Sindh.

Peregrine or Shaheen Falcon *Falco peregrinus*

The Peregrine Falcon is a very high priced bird amongst the Falconers of houbara bustard. It has been a popular bird to capture by licensed and unlicensed collectors alike over the last 40 years. This has caused number to dwindle dangerously low. This bird is considered a flagship species of the Park as sightings are rare.

Red-capped Falcon *Falco pelegrinoides*

Like the Peregrine Falcon, the Red-capped Falcon is also considered a flagship species, but not to the same degree. It has been observed in winter in the cliffs west of Chak Jabbi.

Fairy Pitta or Indian Pitta or *Blue-winged Pitta Pitta brachyuran*

The Fairy Pita is found in Pakistan only in the MHNP for a short time in spring and early summer. The MHNP constitutes the extreme western edge of its distribution in the sub-continent.

Tytler's or Slender Billed Leaf Warbler *Phylloscopus tytleri*

The Slender Billed Leaf Warbler is an internationally 'near threatened' species, which visits the MHNP in small numbers during the double transit migration.

Indicator Species

Habitats with thick undergrowth where the flagship species are generally found, are also inhabited by the scimitar babbler and the barking deer.

Scimitar Babbler

Barking Deer

These two species call loudly and frequently during the daytime. The scimitar babbler calls most of the day, but mostly in the mornings and evenings. The barking deer calls throughout the year in the mornings and evenings, but also when it is disturbed, or in the breeding season. These calling species were then considered indicator species in thick undergrowth habitat of the Kaleej pheasant.

Habitats of Flagship Species and their Locations

Margalla Ravines Near Naval Complex

Zone 8 Subtropical semi-evergreen forest

This habitat covers the plain area and the valleys north of Sector E-7 and E-8 in the middle of the MHNP next to the Faisal mosque and the Kalinjer village located at the north western edge of the naval complex.

Plant species: The area is predominantly occupied by *Accacia modesta, Dodonea viscosa, Olea ferruginia, Ficus palhata, Zizyphus jujuba, Carisa spinarum*, and *Euphorbia royaleana.*

Margalla Ravines at Marghazar Base

Zone 8 Subtropical semi-evergreen forest

This habitat is towards the east of the Sector E-7.

Plant species: The area is mainly occupied by invasive species towards the west and south by the *Brousenatia paperifera*, and ***Lantena*** spp., by the *Albezia lebek* towards the north, the *Mangifera indica*, *Bauhenea variegata*, and *Morus alba* to the East, and *Accacia modesta*, *Olea ferrugenia*, and *Dodonea viscosa* in the higher northern reaches.

From Marghazar Base to East MHNP near Shahdara Kalan Village

Zone 8 Subtropical semi-evergreen forest

This habitat is dry sub-tropical semi evergreen scrub, which gradually merges into a long strip of tropical dry mixed deciduous forest eastwards.

Plant species: *Acacia modesta, Dodonea viscosa, Olea ferrugenia, Ficus palhata, Zizyphus jujuba, Carisa spinarum, Pistacia interima, Pinus roxburghii,* and *Quercus incana*.

Other Bird Species Commonly Found in the Habitats of Flagship Species

1. Common Hawk Cuckoo *Hierococcyx varius*
2. Plaintive Cuckoo *Cacomantis passerinus*
3. Eurasian Cuckoo *Cuculus canorus*
4. Indian or Short-winged Cuckoo *Cuculus micropterus*
5. Peregrine or Shaheen Falcon *Falco peregrinus*
6. Red-capped Falcon *Falco pelegrinoides*
7. Oriental Scops Owl *Otus sunia*
8. Wedge-tailed or Kokla Green Pigeon *Treron sphenura* (Vagarant)
9. Rufous-tailed Rock-thrush *Monticola saxatilis*
10. Eagle Owl *Bubo bubo*
11. Black Partridge *Francolinus francolinus*
12. Chestnut-bellied Rock Thrush *Monticola rufiventris*
13. Yellow-fronted Woodpecker *Dendrocopos mahrattensis*
14. Fulvous-breasted Woodpecker Dendrocopos macei

15. Spotted Dove or Chinese Dove Streptopelia chinensis
16. Western Sirkeer Cuckoo Taccocua leschenaultia
17. Collared Pygmy Owlet Glaucidium brodiei
18. Asian Paradise Flycatcher Terpsiphone paradisi
19. Peking Robin Leiothrix lutea
20. Orange-flanked Bush Robin Tarsiger cyanurus
21. Coppersmith or Crimson-breasted Barbet Megalaima haemacephala
22. Golden Bush Robin Tarsiger chrysaeus
23. Blue-throated Barbet Megalaima asiatica
24. Scaly-bellied Green Woodpecker Picus squamatus
25. Golden-backed Woodpecker Dinopium benghalensis
26. Sindh Pied Woodpecker Dendrocopos assimilis
27. Fairy Pitta or Indian Pitta or Blue-winged Pitta Pitta brachyuran
28. Blue Rock Thrush Monticola solitarius
29. Blue Whistling Thrush Myiophoneus caeruleus
30. Blue Rock Thrush Monticola solitarius
31. Blue Whistling Thrush Myiophoneus caeruleus
32. Dark-throated Thrush or Black-throated Thrush Turdus ruficollis atrogularis
33. White-browed Fantail Flycatcher Rhipidura aureola
34. Rusty-cheeked Scimitar-babbler Pomatorhina erythrogenys
35. Indian Tree Pie Dendrocitta vagabunda
36. Jungle Myna Acridotheres fuscus
37. Tytler's or Slender Billed Leaf Warbler Phylloscopus tytleri

Bird Sampling in Different Habitats

Visual observations of birds in various habitats were made in order to assess the suitability of these habitats for the birds **(Exhibits 5.1** to **5.3)**. The birds were counted in linear samples. Their relative abundance and densities were calculated based on the population number of each species. The categories of the habitats are shown on the vegetation map of the MHNP included in **Section 2**.

Ecological Issues Linked to Birds and Their Habitats

Fire Hazards: Negative Impact of on Some Nesting Birds

A survey of breeding birds was conducted in the bushes and tall grasses growing in the small ravines and gentle slopes west of Jabbi village in the upper part of Kalinger ravine in the last week of May 2005. An area about one km in length, and roughly 100 m wide was checked for bird nests. Thirteen nests with eggs or chicks were found. These included:

- White-cheeked bulbul: Nine nests, two with speckled eggs and seven with nestlings;
- Common babbler: Three nests were found in the bushes, one with sky blue eggs, and two with nestlings;
- Pied chat: One nest with two nestling was found on the ground covered by grass.

A wild fire lasting four or five days in the area is presumed to have destroyed the eggs and birds in the observed area. The breeding season for many birds appears to coincide with the months when fires are most frequent. These fires cause colossal ecological loss to habitats in the MHNP.

Human Habitations Inside the Park and the Close Vicinities

There are approximately 100,000 people living in 34 villages within and in close proximity of the National Park territory. There are over 3,600 houses in these villages. Threats to birdlife from the human activity and settlements are summarized below:

Waste disposal: Solid waste generated on a daily basis is spread in the open or dumped in a depression and burnt. Dumped waste is also used as manure by the villagers, but throwing refuse creates an imbalance of species. Scavenger populations tend to increase in the vicinity of the houses, which subsequently attracts predator species. These predators may also prey upon rare birds in the Park.

Wastewater disposal: Sewerage water from the villages flows down the slopes in the National Park. Sewerage water from two villages flows into natural water streams. Only one village of the 34 in the Park has a soak-pit for a limited quantity of water.

Domestic livestock population: The livestock population of the communities in the National Park breaks down into over 6,000 cows, 30 donkeys, and 13,417 goats (Mirza 2005). These communities procure fodder for their animals from the National Park. Only five villages purchase supplementary fodder. Overgrazing in the Park also makes the soil more compact. Clothes washing and bathing is also a common practice, and contaminates the water flowing downstream of the springs.

Wood theft: All of the villages in the area collect wood from the Park to meet their fuel needs. Only a handful of houses in four villages have Liquid Petroleum Gas (LPG) stoves. However even these households bake bread or *roti* in *tandoors* which consume large quantities of wood. Wood is stolen and transported on camel back to villages in the vicinity as well as to poultry farms for heating, particularly in winter.

Hidden acts of hunting and netting: The hunting and killing of barking deer and gorals, and the netting of partridges has been reported. Occasionally, the eggs of the Kaleej pheasant are stolen. Other factors that degrade bird habitats include road network developments, traffic, the establishment of new restaurants, quarrying in the Park, and soil erosion. These have already been discussed in detail in the introductory chapter.

Potential Areas for Habitat Restoration

Ravines North of Mera Bhairi

Mera Bhairi is a large village in the western flank of the MHNP to the north of sector E-10 in Islamabad. The ravines to the north of this village have open thorn scrub, even on the cliffs and ledges. The tropical thorn forest habitat west of this area extends to the Fecto cement factory. However, the entire area is subject to severe degradation.

Ravines North of Kalinjer Village

Zone 8 subtropical semi-evergreen forest is subject to degradation. Pinus roxburghii and Quercus incana occur at elevations above 975 m. These trees have patches of under story cover in the north facing aspects of the mountain, particularly in the depressions. The Zone 7, subtropical pine forest, is subject to regular annual fires and wood theft.

The degraded habitats of the valleys north of Kalinjar and Mera Bheri can still be saved, and the dispersal of flagship species increased, if the following measures are adopted:

1. Livestock grazing must be controlled;
2. Wood theft must be stopped completely, or at least controlled;
3. The community from Jabbi must be mobilized to help prevent forest fires.

Exhibit 5.1: Birds of Subtropical Semi-evergreen Forest (Zone 8)

The density of birds was calculated using the following formula:

$$\text{Density, Number/km}^2 = \frac{\text{Total number of individuals of a species in all quadrates taken}}{\text{Area of the quadrates taken}}$$

The relative abundance of the species was determined by applying the following formula:

$$\text{Relative Abundance} = \frac{\text{Number of species}}{\text{Total number of all species}}$$

No	Name of bird	Total	Relative Abundance	Density/km^2
1.	**Indian Kite or Pariah Kite** *Milvus migrans*	5 Flying	Not considered	Not considered
2.	**Steppe Eagle** *Aquila rapex nipalensis*	1 Flying	Not considered	Not considered
3.	**Kaleej Pheasant or White-crested Kaleej** *Lophura leucomelana*	6 Territorial	02.65	60
4.	**Sindh Pied Woodpecker** *Dendrocopos assimilis*	3	1.32	30
5.	**Black Bulbul** *Hypsipetes madagascariensis*	19	08.40	190
6.	**White-cheeked Bulbul** *Pycnonotus leucogenys*	47	20.79	470
7.	**Red-vented Bulbul** *Pycnonotus cafer*	8	03.53	80
8.	**Blue Whistling Thrush** *Myiophoneus caeruleus*	3	01.32	30
9.	**Rufous-fronted Wren Warbler** *Prinia buchanani*	1	00.44	10
10.	**Greenish Warbler or Dull Green Leaf Warbler** *Phylloscopus trochiloides*	8	03.53	80
11.	**White-throated Fantail Flycatcher** *Rhipidura albicollis*	3	01.32	30
12.	**Rusty-cheeked Scimitar-babbler** *Pomatorhina erythrogenys*	1	00.44	10
13.	**Jungle Babbler** *Turdoides striatus*	8	03.53	80
14.	**Great Tit** *Parus major*	20	08.84	200
15.	**Bar-tailed or Himalayan Tree-creeper** *Certhia himalayana*	2	0.88	20

16.	**Oriental White-eye** *Zosterops palpebrosa*	31	13.71	310
17.	**Indian Tree Pie** *Dendrocitta vagabunda*	7	03.09	70
18.	**House Crow** *Corvus splendens*	12	05.76	130
19.	**Carrion Crow** *Corvus corone*	2	0.88	20
20.	**Himalayan Jungle Crow** *Corvus macrorhynchos*	8	03.53	80
21.	**Common Myana** *Acredotheres tristis*	10	04.42	100
22.	**Sindh Pied Woodpecker** *Dendrocopos assimilis*	3	01.32	30

Total No. of species: 22 and total number of birds = 208

Exhibit 5.2: Birds of Subtropical Forest at Lower Elevations and Subtropical Pine Forest (Zone 4, 7)

No.	Name of bird	Total	Relative Abundance	Density / km^2
1.	**White-cheeked Bulbul** *Pycnonotus leucogenys*	32	15.15	320
2.	**Blue Whistling Thrush** *Myiophoneus caeruleus*	2	00.88	20
3.	**Great Tit** *Parus major*	26	11.50	260
4.	**Black Crested Tit** *Parus rufonuchalis*	4	01.76	40
5.	**Spotted Dove** *Streptopelia chinensis*	1	00.44	10
6.	**Sindh Pied Woodpecker** *Dendrocopos assimilis*	1	00.44	10
7.	**Common Myna** *Acredotheres tristis*	8	03.53	80
8.	**Red-vented Bulbul** *Pycnonotus cafer*	11	04.86	110
9.	**Brown rock chat** *Cercomela fusca*	2	00.88	20
10.	**House sparrow** *Passer domesticus*	4	01.76	40
11.	**Indian Tree Pie** *Dendrocitta vagabunda*	10	04.42	100
12.	**Ashy Drongo** *Dicrurus leucophaeus*	2	00.88	20
13.	**Oriental White-eye** *Zosterops palpebrosa*	15		150
14.	**Sulphur-bellied or Olivaceous Warbler** *Phylloscopus griseolus*	2	00.88	20
15.	**Tickell's or Chinese Leaf Warbler** *Phylloscopus affinis*	25	11.06	250
16.	**Rusty-cheeked Scimitar-babbler** *Pomatorhinus erythrogenys*	6	02.65	60
17.	**Mountain Chiff-chaff / Sind Chiffchaff** *Phylloscopus sindianus*	27	11.94	270
18.	**Jungle crow** *Corvus macrorhynchos*	19	08.40	190
19.	**Eurasian Sparrow Hawk** *Accipiter nisus*	1	00.44	10
20.	**Black bulbul** *Hypipetes madagascariensis*	22	09.73	220
21.	**Scaly-bellied woodpecker** *icus squamatus*	2	00.88	20
22.	**Bar-tailed or Himalayan Tree-creeper** *Certhia himalayana*	4	01.76	40

Species Diversity = 12 and Birds Population = 159

Exhibit 5.3: Birds of Degraded Land, Cultivation, and Scattered Settlements (Zone 3)

No	Name of bird	Summer 2004	Winter 2004-05	Spring 2005
1.	**Eurasian Kestrel** *Falco tinnunculus*	*	*	*
2.	**Black Partridge** *Francolinus francolinus*			
3.	**Grey Partridge** *Francolinus pondicerianus*	*	*	*
4.	**Indian Ring Dove** *Streptopelia decaocto*	*	*	*
5.	**Oriental Turtle Dove** *Streptopelia orientalis*		*	
6.	**Little Brown Dove** *Streptopelia senegalensis*	*	*	*
7.	**Spotted Dove or Chinese Dove** *Streptopelia chinensis*		*	*
8.	**Rose-ringed Parakeet** *Psittacula krameri*	*	*	*
9.	**Blossom-headed Parakeet** *Psittacula cyanocephala*	*	*	*
10.	**Pied Crested Cuckoo** *Clamator jacobinus*	*		
11.	**Common Hawk Cuckoo** *Hierococcyx varius*	*		
12.	**Plaintive Cuckoo** *Cacomantis passerinus*	*		
13.	**Indian or Short-winged Cuckoo** *Cuculus micropterus*	*		
14.	**Eurasian Cuckoo** *Cuculus canorus*	*		
15.	**Western Sirkeer Cuckoo** *Taccocua leschenaultii*	*	*	*
16.	**Pallid or striated Scops Owl** *Otus brucei*	*		
17.	**Collared Pygmy Owlet** *Glaucidium brodie*	*	*	*
18.	**West Himalayan Barred Owlet** *Glaucidium cuculoides*	*	*	*
19.	**Spotted Owlet** *Athene brama*	*	*	*
20.	**Savanna or Allied Nightjar** *Caprimulgus affinis*	*	*	*
21.	**Long-tailed Nightjar** *Caprimulgus macrurus*	*	*	*
22.	**Little Swift or House Swift** *Apus affinis*	*	*	*
23.	**White-breasted Kingfisher** *Halcyon smyrnensis* (near streams)	*	*	*
24.	**Little Green Bee-eater** *Merops orientalis*	*	*	*
25.	**Hoopoe** *Upupa epops*	*	*	*
26.	**Great Hill Barbet** *Megalaima virens*	*	*	*
27.	**Yellow-fronted Woodpecker** *Dendrocopos mahrattensis*	*	*	*
28.	**Crested Lark** *Galerida cristata*	*	*	*
29.	**Brown Rock Pipit or Persian Rock Pipit or Long-billed Pipit** *Anthus similis*	*	*	*
30.	**Yellow Wagtail** *Motacilla flava*		*	
31.	**Yellow-headed Wagtail** *Motacilla citreola*		*	
34.	**White-cheeked Bulbul** *Pycnonotus leucogenys*	*	*	*
35.	**Red-vented Bulbul** *Pycnonotus cafer*	*	*	*
36.	**Indian Magpie Robin** *Copsychus saularis*	*	*	*
37.	**Stonechat or Collard Indian Bush-Chat** *Saxicola torquata*	*	*	*
38.	**Pied Bush-Chat** *Saxicola caprata*	*	*	*

Continues…

…Continued

No	Name of bird	Summer 2004	Winter 2004-05	Spring 2005
39.	**Blue Whistling Thrush** *Myiophoneus caeruleus* (in streams)		*	
40.	**Ashy-grey Wren Warbler** *Prinia hodgsonii*		*	
41.	**Rufous-fronted Wren Warbler** *Prinia buchanani*		*	
42.	**Streaked Scrub Warbler** *Scotocerca inquieta*	*	*	*
43.	**Tailor Bird** *Orthotomus sutorius*	*	*	*
44.	**Lesser Whitethroat** *Sylvia curruca*		*	
45.	**Grey-headed Flycatcher Warbler** *Seicercus xanthoschistos*	*		
46.	**Greenish Warbler or Dull Green Leaf Warbler** *Phylloscopus torchiloides*		*	
47.	**Eurasian Chiffchaff or Brown Chiffchaff** *Pylloscopus collybita*		*	
48.	**Brown Flycatcher** *Muscicapa latirostris*	*		
49.	**White-throated Fantail Flycatcher** *Rhipidura albicollis*		*	
50.	**Asian Paradise Flycatcher** *Terpsiphone paradisi*			*
51.	**Rusty-cheeked Scimitar-babbler** *Pomatorhina erythrogenys*	*	*	*
52.	**Common Babbler** *Turdoides caudatus*	*	*	*
53.	**Jungle Babbler** *Turdoides striatus*	*	*	*
54.	**Black Crested Tit or Simla Tit** *Parus rufonuchalis*		*	
55.	**Great Tit** *Parus major*		*	
56.	**Purple Sunbird** *Nectarinia asiatica*	*		*
57.	**Oriental White-eye** *Zosterops palpebrosa*		*	
58.	**Golden Oriole** Oriolus orioluss	*		
59.	**Rufous-backed Shrike** *Lanius chach*	*	*	*
60.	**Black Drongo** *Dicrurus macrocercus*	*	*	*
61.	**Indian Tree Pie** *Dendrocitta vagabunda*	*	*	*
62.	**House Crow** *Corvus splendens*	*	*	*
63.	**Black headed or Brahminy Myana** *Sturnus pagodarum*	*	*	*
64.	**Common Starling** *Sturnus vulgaris*		*	
65.	**Common Myana** *Acredotheres tristis*	*	*	*
66.	**Bank Myana** *Acridotheres ginginianus*	*	*	*
67.	**House Sparrow** *Passer domesticus*	*	*	*
68.	**Goldfinch** *Carduelis carduelis*		*	
69.	**Pine Bunting** *Emberiza leucocephalos*		*	
70.	**Rock Bunting** *Emberiza cia*		*	

6.Fish

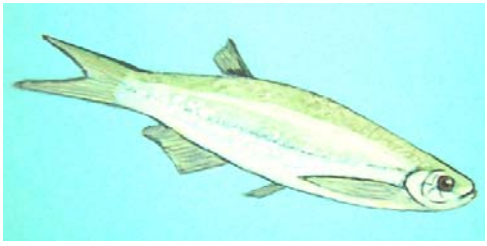
There are several small-sized species of fish in shallow water streams in the Margalla Hills. Most are non-commercial and have no market value, but some have an ornamental value.

Bidda *Chela cachius*

The Bidda is a shallow stream fish commonly found in the perennial streams of the Margalla Hills. It does not have commercial, but has an ornamental value.

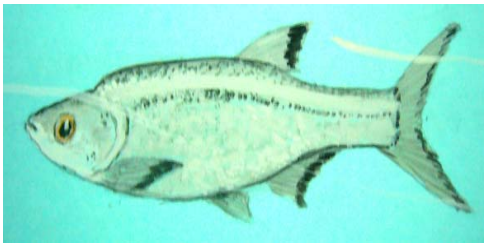
Punjabi Chal *Salmostoma punjabensis*

The Punjabi Chal is a non-commercial fish commonly found in pools formed by springs or streams.



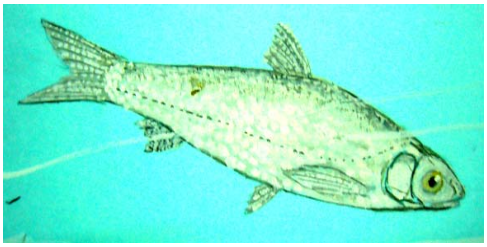
Mola Chilwa *Amblypharyngodon mola*

A rare fish, the Mola Chilwa lives in running water. It has no commercial-value.



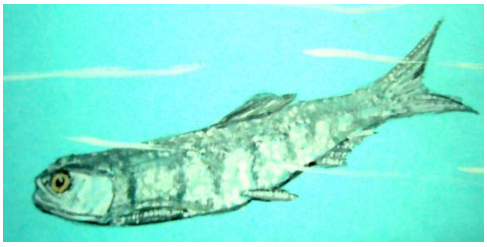
Common Chilwa *Aspidopana morar*

The Common Chilwa, a fish with no commercial-value is a stagnant water fish. The Common Chilwa population is quite low because stagnant pools are rare in the Margalla Hills.



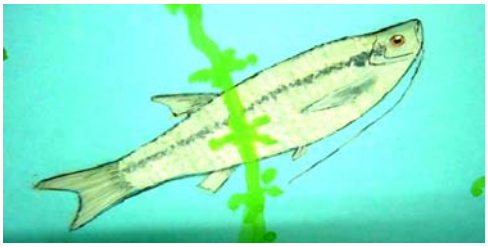
Pakistani Chilwa *Barilius pakistanicus*

The Pakistani Chilwa is found abundantly in pools. It has no commercial value.



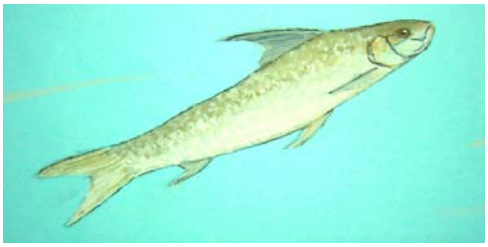
Soomara *Esomus danricus*

The Soomara is a rare, non-commercial fish that lives in pools.



Chhali *Labeo dero*

The Chhali is a common fish that lives in pools. It has no commercial-value.

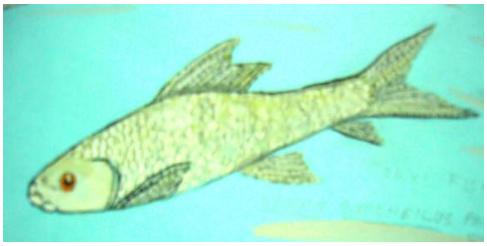


Sabzug *Cyprinion watsoni*

The Sabzug is a common non-commercial fish of larger pools, but such pools are rare in the Margalla.

Pakistani Torki *Labeo dyocheilus pakistanicus*

The Pakistani Torki is a common commercial fish of larger pools, but such pools are rare in the Margalla Hills.

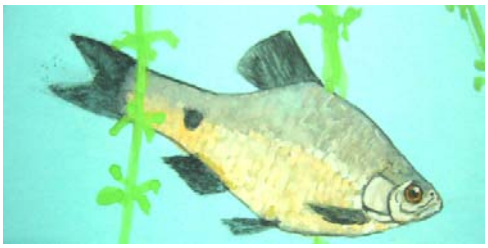


Sophore Popra *Puntius sophore*

The Sophore Popra is a common stagnant water fish with no commercial value.

Ticto Popra *Puntius ticto*

The Ticto Popra is a common noncommercial stagnant water fish.



Dogra Fish *Crossocheilus diplocheilus*

The Dogra Fish is a common noncommercial fish that lives in running water and pools.

Patherchatta *Garra gotyla*

The Patherchatta is common in the stony beds of running waters. It is a non-commercial fish.

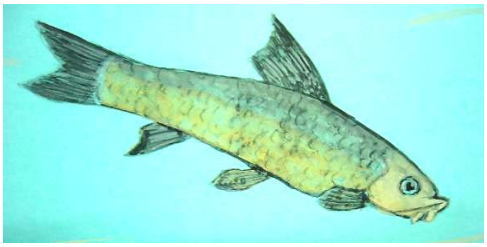


Exhibit 6.1: Fish Fauna of Different Streams of the MHNP Area

No.	Scientific Name	Common Name	Habitat	Commercial Importance	Status
	Family Cyprinidae				
1.	*Chela cachius*	Bidda	Shallow river water	Non-commercial	Common
2.	*Salmostoma punjabensis*	Punjabi chal	Pools	Non-commercial	Common
3.	*Amblypharyngodon mola*	Mola chilwa	Running water	Non-commercial	Rare
4.	*Aspidopana morar*	Common chilwa	Stagnant water	Non-commercial	Common
5.	*Barilius pakistanicus*	Pakistani chilwa	Pools	Non-commercial	Common
6.	*Esomus danricus*	Soomara	Small pools	Non-commercial	Rare
7.	*Cyprinion watsoni*	Sabzug	Pools	Non-commercial	Common
8.	*Labeo dero*	Chhali	Pools and reservoirs	Commercial	Common
9.	*Labeo dyocheilus Pakistanicus*	Pakistani torki	Pools and reservoirs	Commercial	Rare
10.	*Puntius sophore*	Sophore popra	Stagnant water	Non-commercial	Common
11.	*Puntius ticto*	Ticto popra	Stagnant water	Non-commercial	Common
12.	*Crossocheilus diplocheilus*	Dogra	All water bodies	Non-commercial	Common
13.	*Garra gotyla*	Patherchatta	Stony beds	Non-commercial	Common

Exhibit 6.2: Distribution and Relative Abundance of the Fish Fauna of the MHNP Area

No	Scientific Name	Distribution								Total	Relative Abundance
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8		
1.	*Chela cachius*	34	50	12	15	0	65	0	0	176	0.117
2.	*Salmostoma punjabensis*	9	12	8	6	0	22	0	0	57	0.038
3.	*Amblypharyngodon mola*	5	0	0	0	0	7	0	0	12	0.008
4.	*Aspidopana morar*	31	12	24	28	0	8	0	0	103	0.063
5.	*Barilius pakistanicus*	50	36	21	9	0	35	0	0	151	0.100
6.	*Esomus danricus*	0	0	6	3	0	0	0	0	9	0.006
7.	*Cyprinion watsoni*	36	45	68	56	0	38	0	0	243	0.162
8.	*Labeo dero*	24	17	24	13	0	27	0	0	105	0.070
9.	*Labeodyocheilus Pakistanicus*	0	0	2	4	0	4	0	0	10	0.007
10.	*Puntius sophore*	23	14	27	15	0	8	0	0	87	0.058
11.	*Puntius ticto*	7	9	5	13	0	6	0	0	40	0.027
12.	*Crossocheilus diplocheilus*	35	64	23	18	0	36	0	0	176	0.117
13.	*Garra gotyla*	13	18	23	25	0	12	0	0	91	0.061
	Total									**1,260**	

Zone 1: Settlements

Zone 2: Cultivated land

Zone 3: Degraded land/cultivation/scattered settlements

Zone 4: Subtropical forest at lower elevations- degraded

Zone 5: Subtropical forest at higher elevation- degrade

Zone 6: Invasive species *Broussonetia papyrefera* dominated vegetation

Zone 7: Subtropical pine forest

Zone 8: Subtropical semi-evergreen forest

7.Reptilia and Amphibia

7.1 Review of Literature

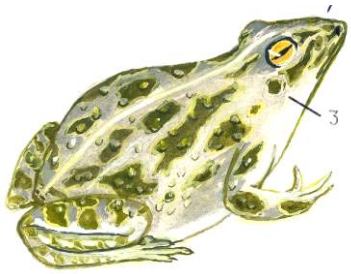
Boulenger (1890), Minton (1966), Mertens (1969), Khan (1993), and Baig (1997) have a given a broad view of the Herpetofauna of Pakistan. The main emphasis in Northern Pakistan however, has been given to the Potowar Plateau and Azad Kashmir (Baig 1998 and Khan 1979). The Potowar Plateau and Azad Kashmir inhabit the highest diversity of reptilian fauna in Pakistan because of the unique topography and other ecological factors (Baig, 1998) such as diversity of habitats.

7.2 Toads and Frogs of Margalla Hills

Skittering Frog *Euphlyctis cyanophlyctis*

Is the Skittering Frog is an olive colored, almost black, covered with sooty spots. It has a wide head and visible external vocal sacs, which are wide apart.

Indian Burrowing Frog *Tomopterna brevicep*



The Indian Burrowing Frog is a light olive brown frog, faintly mottled on the upper side. It buries itself in soft sandy soil during the non-breeding period, but moves to large pools in the rainy season. Generally active at night, it may also be seen in the mornings and afternoons if the sky is cloudy.

Tiger Frog *Hoplobatrachus tigerinus*

The Tiger Frog is found in large pools and permanently flowing streams. Color varies with age. Adults are olive brown with blackish spots and cream colored streaks. Young frogs are grass colored. Adults become palerin the breeding season during the monsoon rains. They are also more vocal in this season.

Ant Frog *Microhyla ornata*

The Ant Frog is less than 25 mm in length. Its pupil is circular. It is dull colored and inconspicuous but agile. It is Oriental species represented in Margalla Hills.

Common House Toad *Bufo stomaticus*

The Common House Toad is found in abundance human habitations in the Margalla Hills. It is active from the morning to the evening in the summer and feeds on insects attracted to artificial light.

Hazara Toad *Bufo melanostictus*

The Hazara Toad is a common hill species and found all over the Margalla Hills.

7.3 Lizards and Snakes of Margalla Hills

7.3.1 Lizards

Fat-Tailed Gecko *Eublepharis macularius*

The Fat-Tailed Gecko is an arid area Oriental species found on the western edge of the Margalla Range. It is pale brown and spotted or reticulated with yellow or some times bluish gray colors. The young are brown with yellow and white cross-bands. It is mainly insectivorous but occasionally eats other geckos. The fat-tailed Gecko is distinguished from other lizards by its fat tail.

Brook Gecko *Hemidactylus brooki*

The Brook Gecko is the most common nocturnal house lizard of the eastern half of the Margalla Hills in houses, trees, and stones. It is an Afro-Asian species but has become cosmopolitan through cargo ships. Colors tend to be light variants of is variable from brownish to grayish, and white with whitish undersurface. It is nocturnal, and often calls after dusk.

Northern House Gecko
Hemidactylus flaviviridis

A common house gecko, the Northern House Gecko is a pale grey lizard with indistinct markings and flattened fingers. The skin on its back has few or no tubercles. It is a warm weather creature and remains hidden and torpid in winter.

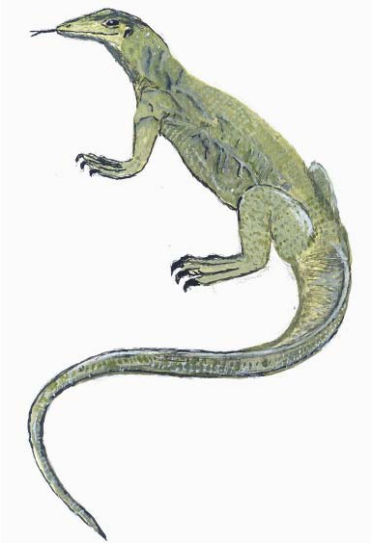
Garden Lizard *Calotes versicolor*

The Garden Lizard is commonly found in the Margalla Hills in bushes and trees. It has a long-tail, bilaterally compressed body, an oval head, and swollen cheeks. It has a row of long keeled scales forming a dorsal crest from back of the neck to the base of the tail. It is usually a sandy gray color, but males have the ability to change color at will in breeding season. The front part from forelegs to head becomes a brilliant red or scarlet. The throat develops black patches on the sides.

Skink Mabuya *dissimilis*

The Skink is found in forest grounds, usually in soils rich in humus. Though relatively unstudied, it is known to have an elongated, flat body covered with smooth, glossy imbricate scales. Its tongue is also chemo and thermo-sensitive similar to that of snakes. It is a ground insect eater.

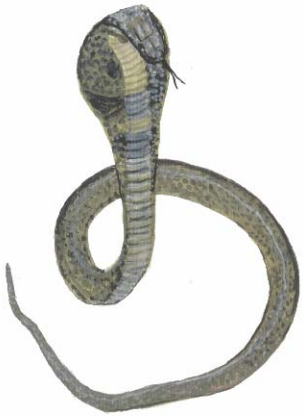
Indian Monitor Lizard
Varanus bengaiensis



The Indian Monitor Lizard is wide spread across the Margalla Hills and is usually found living in burrows or rock crevices. It is large (over one meter), and olive gray or slightly brown in color. It is flattened dorso-ventrally. It has a long neck, and bilaterally compressed tail. It has strong limbs and claws, and well-developed eyelids. Its tongue is slender, long and bifurcated anteriorly. The tongue is flickered in the manner of a snake. It eats insects, rodents, bats, other lizards and the eggs or nestlings of birds.

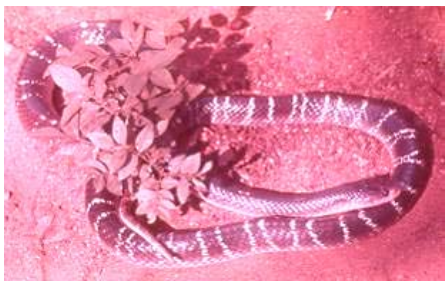
7.3.2 Snakes

Central Asian Cobra *Naja naja oxiana*



The Central Asian Cobra is a Palaearctic subspecies and is quite common and widespread in the Margalla Hills. Its distinguishing feature is that its spreads its hood when excited or disturbed. Adult cobras are dark brown or black. Juveniles have alternating wide and narrow cross bands along the length of their bodies from behind the head. There is no pattern on the hood in adults, as in the Indian Cobra. Young cobras have patterns of wide dark transverse bars. The ventral side of the hood is usually pale yellow or white in juveniles.

Krait Bungarus *aeruleus*

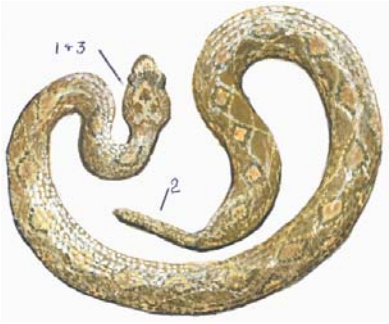


The Krait is a very common snake of the Margalla Hills. It is highly poisonous and neurotoxic, but not very aggressive. It is easily identifiable by its glossy black or dark brown body—apart from the underside which is creamy— with white cross streaks, 2 mid dorsal rows of enlarged and hexagonal scales, and small black eyes with indistinct pupils.

Russel's Viper *Vipera russelii*

The Russel's Viper is a large, arrow-headed snake with small imbricate scales. There are three rows of fairly large and long dark patches on its brown body, with dark brown and thin white margins. Its body is massive and tapering on both ends. Its head is flat; nostrils are wide and pupils are vertical, and its tail tapers abruptly after the vent. It is highly poisonous and haemotoxic.

Saw-Scaled Viper *Echis carinatus*



The Saw-Scaled Viper is a small poisonous snake common to the Margalla Hills. It is arrow-headed, has a small tail, and small imbricate scales on its body. Its body is grayish brown with dark markings. It is whitish on the underside with brown spots. Its eyes are large, with golden irises and vertical pupils. At rest, it sits in a double coil with its head in the center and moves by 'side winding'.

Rat Snake *Ptyas mucosus*

The Rat Snake is the most common nonpoisonous snake of the Margalla Hills. Olive-brown in color, its scales on the lips and the ventral scales are margined with black. Its belly is yellowish white. It

is a strong swimmer and prefers to remain submerged in water in the summer. Very agile, it climbs bushes and short trees to find eggs and nestlings. It also enters burrows to find rodents.

Water Snake *Xenochrophis piscator*

The Water Snake is common in the ponds and streams of the Margalla Hills where it feeds on frogs and small fish. It is not poisonous, but very aggressive, attacking repeatedly with very painful bites.

Exhibit 7.1: Amphibians and Reptilian Fauna of the MHNP Area

No	Species	Common Name	Status	Major Habitat
1.	*Euphlyctis cyanophlyctis*	Skittering Frog	Common	Water pools
2.	*Tomopterna brevicep*	Indian Burrowing Frog	Common	Moist areas
3.	*Hoplobatrachus tigerinus*	Tiger Frog	Common	Pools, ponds
4	*Microhyla ornata*	Short Ant Frog	Common	Grassy fields
5	*Bufo stomaticus*	Marbelled Toad	Rare	Ponds
6	*Bufo melanostictus*	Asian Garden Toad	Rare	Parks, gardens
7	*Eublepharis macularius*	Fat-tailed Leopard Gecko	Rare	Rock crevices
8	*Hemidactylus brooki*	Brook's House Gecko	Common	Buildings
9	*Hemidactylus flaviviridis*	Yellow-green House Gecko	Common	Barks of tree trunks
10	*Calotes versicolor*	Garden Lizard	Common	Bushes, shrubs
11	*Mabuya dissimilis*	Mabua	Common	Grassy fields
12	*Varanus bengaiensis*	Monitor Lizard	Least common	Agricultural fields
13	*Ptyas mucosus*	Rat Snake	Common	Forests
14	*Xenochrophis piscator*	Checkered-keelback Water Snake	Common	Water bodies
15	*Naja naja oxiana*	Central Asian Cobra	Least common	Deserted habitats
16	*Bunganus caeruleus*	Indian Krait	Least common	Deserted habitats
17	*Vipera russelii*	Russel's Viper	Rare	Deserted habitats
18	*Echis caninatus*	Saw-scaled Vviper	Least common	Arid region

Exhibit 7.2: Distribution and Relative Abundance of the Herpeto-fauna of the MHNP

The relative abundance of the species was determined by applying the following formula:

$$\text{Relative Abundance} = \frac{\text{Number of species}}{\text{Total number of all species}}$$

No	Scientific Name	Distribution								Total	Relative Abundance
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8		
1	*Euphlyctis cyanophlyctis*	145	130	121	0	0	0	0	0	396	0.338
2	*Tomopterna brevicep*	10	8	13	20	0	0	0	0	51	0.043
3	*Hoplobatrachus tigerinus*	15	18	25	0	0	0	0	0	58	0.049
4	*Microhyla ornata*	24	12	10	0	0	0	0	0	46	0.039
5	*Bufo stomaticus*	23	28	30	32	0	0	0	0	113	0.096
6	*Bufo melanostictus*	7	8	4	9	13	17	16	24	98	0.083
7	*Eublepharis macularius*	0	0	0	0	0	0	0	8	8	0.007
8	*Hemidactylus brooki*	23	45	42	0	0	0	0	0	110	0.094
9	*Hemidactylus flaviviridis*	0	0	0	0	10	14	12	9	45	0.038
10	*Calotes versicolor*	12	15	9	6	0	0	0	0	42	0.036
11	*Mabuya dissimilis*	0	8	6	3	0	0	0	0	17	0.014
12	*Varanus bengaiensis*	2	4	3	5	8	6	3	2	33	0.028
13	*Ptyas mucosus*	2	4	4	1	3	6	1	1	22	0.019
14	*Xenochrophis piscator*	1	3	2	1	4	3	2	3	19	0.016
15	*Naja oxianus*	1	2	4	1	1	2	1	3	15	0.013
16	*Bunganus caeruleus*	1	2	1	2	1	2	2	3	14	0.012
17	*Vipera russelii*	1	1	2	1	0	0	1	3	9	0.008
18	*Echis caninatus*	1	3	1	4	2	4	1	1	17	0.0145
	Total									**1,113**	

Zone 1: Settlements

Zone 2: Cultivated land

Zone 3: Degraded land/cultivation/scattered settlements

Zone 4: Subtropical forest at lower elevations- degraded

Zone 5: Subtropical forest at higher elevation- degrade

Zone 6: Invasive species *Broussonetia papyrefera* dominated vegetation

Zone 7: Subtropical pine forest

Zone : Subtropical semi-evergreen forest

8. Diversity of Butterfly Fauna in the MHNP Area

The Margalla Hills with their diversity of habitats, including the floral beds of the bungalows of Islamabad in the close vicinity, profusion of plants and flowers, and abundant sunshine, are a natural heaven for a variety species of butterflies. While the larvae of butterflies eat soft foliage of various plants, the adults feed on nectar and they need water. The butterflies of the MHNP fly during the day and are usually present wherever the flowers are. Some species assemble in large numbers at their salt licks while some are fond of rotting fruits. Certain parasitic wasps kill the larvae of butterflies and several species of birds look for them to feed to their nestlings. Even the adult butterflies fall prey to some insectivorous birds as well as the carnivorous Kestrel. They are clearly an important part of the food chain in nature.

Fifty-five species of butterfly have been reported to exist in the MHNP. Of these, 24 are considered common, 28 fairly common or frequently occurring, and 3 are rare. The butterflies in the MHNP belong to seven families, which are described briefly below:

Family PAPILIONIDAE

These are called 'Swallow tails' as many have elongated hind wings, or hind wing adornment projections. Their dark or black forewings have several colorful markings. They have well developed legs and large simple claws. Their larvae are smooth and hairless. Butterflies from this family are usually preyed upon by birds. Young larvae of the Lime butterfly resemble bird droppings, an adaptation to escape predation. Their pupae are attached to branches head up.

Family PIERIDAE

These are also called whites and yellows, or orange-yellows. They have dark markings. The hind wings are never adorned by a tail. The legs are fully developed with toothed claws. Larvae are smooth, though some species have a few very fine hairs. This family is also preyed upon by birds. The pupae are attached to branches laterally or upright.

Family DANAIDAE

This family of butterflies is the most varied in terms of variety and number. Some are called tigers and others crows depending on their colors and markings. These butterflies are unpalatable thereby attracting few predators. Other defense mechanisms include mimicking the colors of predators to deceive them. The larvae of these butterflies usually have spiny processes on each segment, or on head and tail only. The pupae are suspended from the tail end.

Family NYMPHALIDAE

This is one of the largest families of butterflies in the MHNP. These fly about in the daytime, and spread their wings after they settle down to show off their colorful wings. The colors of the sexes differ in many species. Their forelegs are weak. The larvae of these butterflies have spiny processes arranged on their bodies. The Pupae hang from the tail end. This is done as the transformation of larva to pupa takes place. The covering sheet starts its formation with attachment to a branch from its anal end through a sticky excretion.

Family HESPIRIDAE

These butterflies are also called 'Skippers'. These are usually brown in color and resemble moths. Each club of the antenna has a hook at the tip. Their forelegs are fully developed with short but thick claws. The larvae are smooth bodied, slightly flattened and have a distinct neck.

Family SATYRIDAE

This family consists mainly of small butterflies. Many species have tails on their hind wings. Forelegs are perfect or slightly reduced. The males have a single claw. The larvae are somewhat flattened and have a smooth body without long hair.

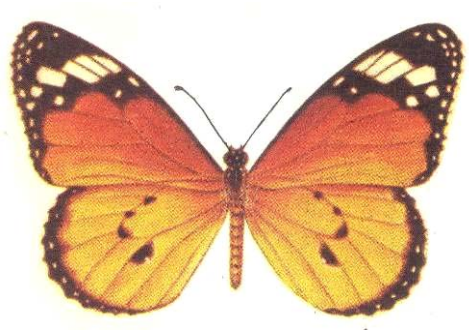
These are commonly called 'browns' or 'Arguses'. They are generally brown in color with 'eyes' or ocelli. Their forelegs are degenerated. This family tends to shy away from sunshine, preferring shady areas. They fly close to the ground, settle on grass or leaves, close their wings and tilt to one side, giving the illusion of a fallen leaf. The larvae are pointed on both ends. Those who study the legs or claws also know what is perfect or reduced. These terms should remain. Common man usually watches the pattern on the wings which is given in the pictures of some common butterflies.

Family LYCAENIDAE

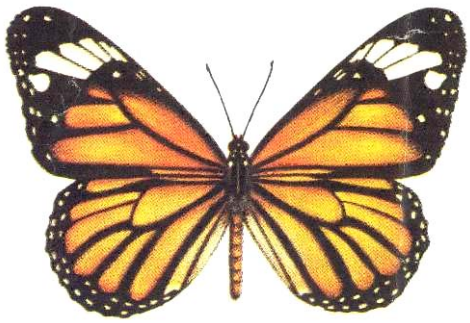
These are mostly small butterflies. Many species have tails on their hind wings. Forelegs are perfect or slightly reduced. The males have a single claw. The larvae are somewhat flattened and have a smooth, hairless body.

Exhibit 8.1: Butterfly of the MHNP

Family DANAIDAE Paintings

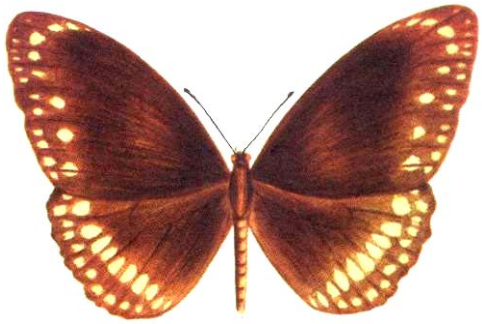


Plain Tiger



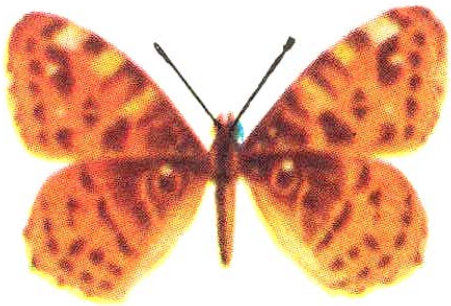
Common Tiger

Blue Tiger

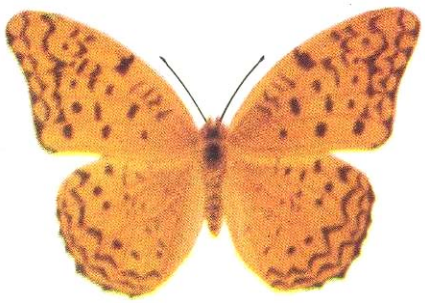


Common Indian Crow

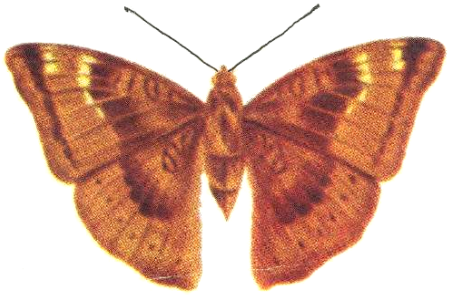
Family NYMPHALIDAE Paintings



Mongol

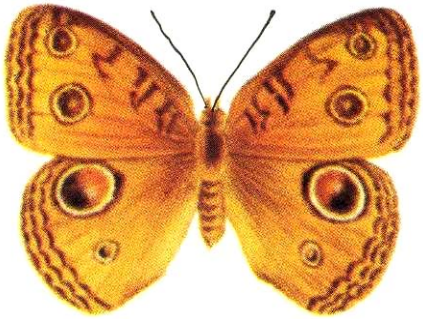


Common Leopard

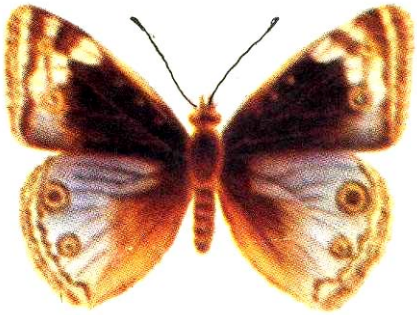


Baron

Great Eggfly

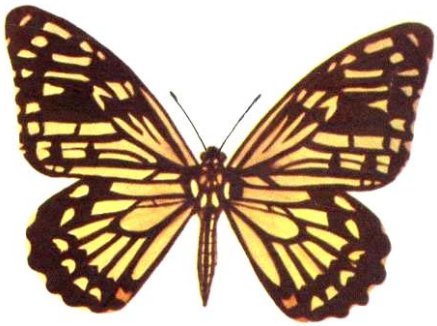


Peacock Pansy

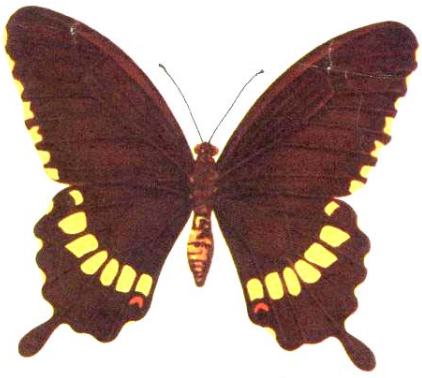


Blue Pansy

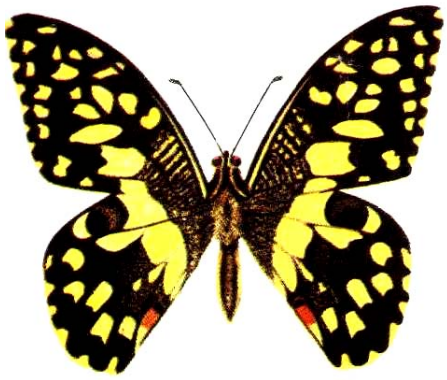
Family PAPILIONIDAE Paintings



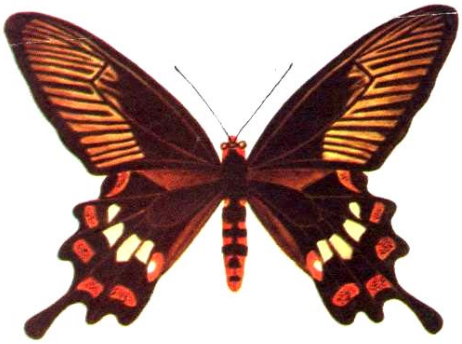
Common Mime



Common Mormon



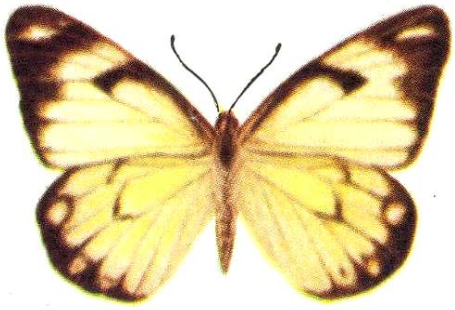
Lime Butterfly



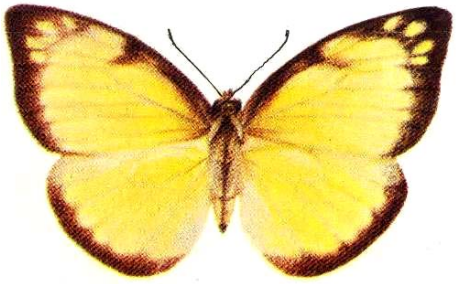
Common Rose

Common Windmill

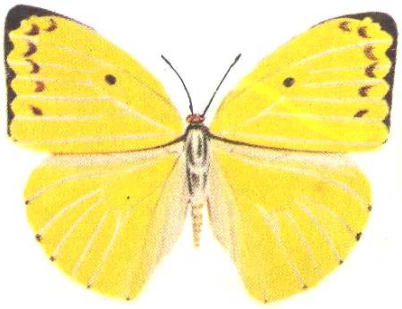
Family PIERIDAE Paintings



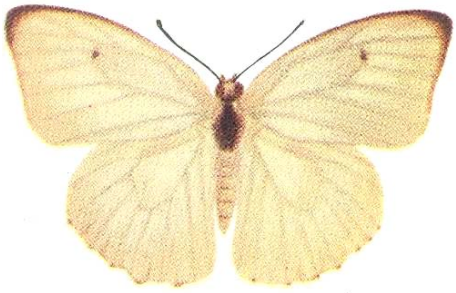
Pioneer



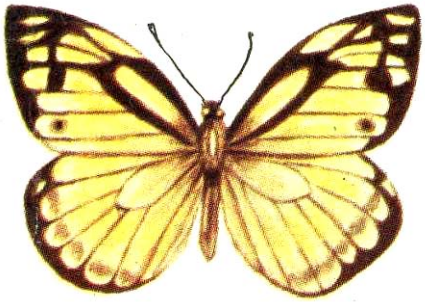
Common Emigrant



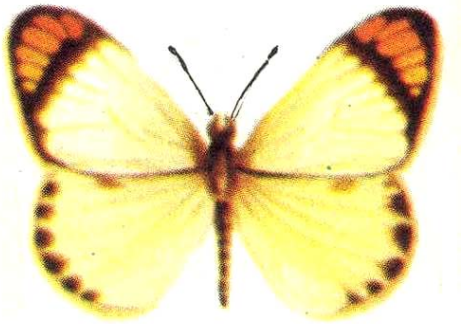
Lemon Emigrant



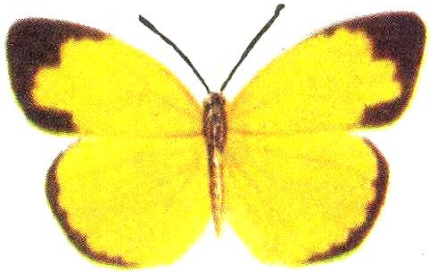
Mottled Emigrant



Common Gull



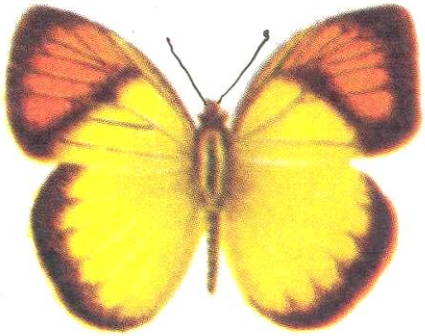
Little Orange Tip



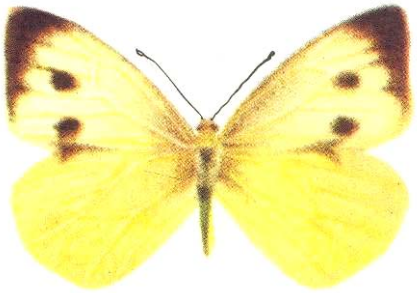
Common Grass Yellow

Common Brimstone

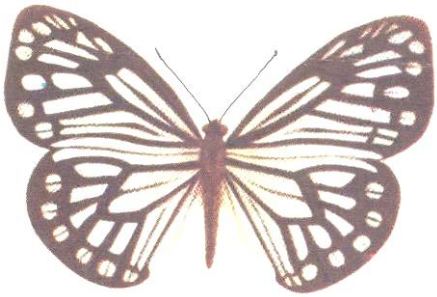
Yellow Orange Tip



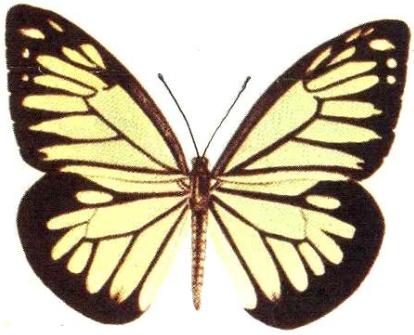
Yellow Orange Tip



Large Cabbage White

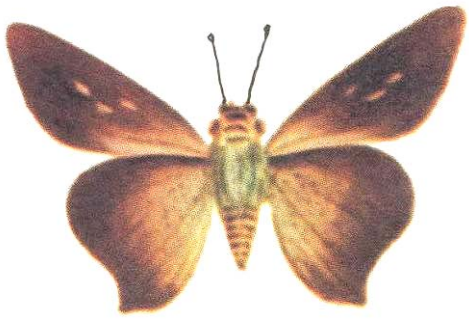


Common Wanderer

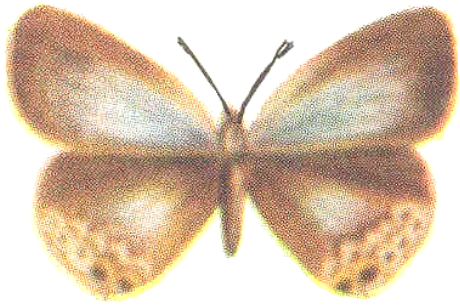


Common Wanderer

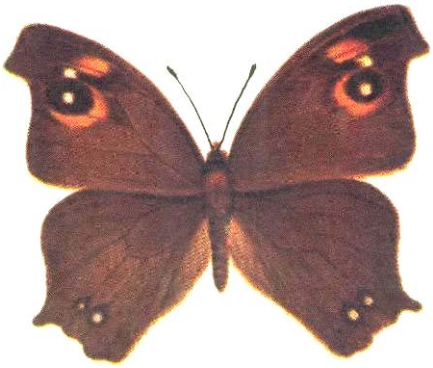
Family SATYRIDAE Paintings



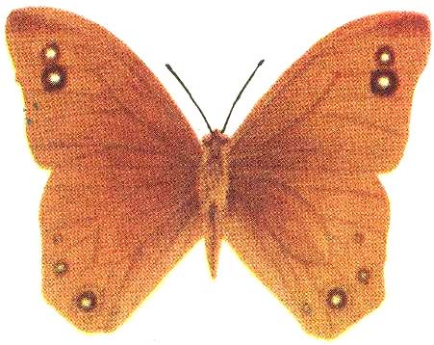
Brown Awl



Pea Blue



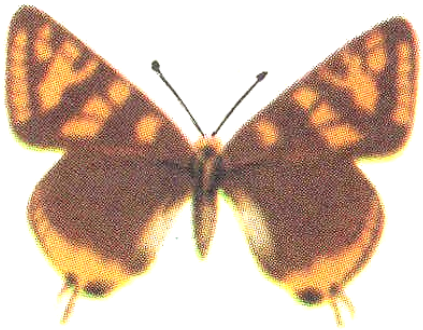
Common Evening Brown Dry Season Form



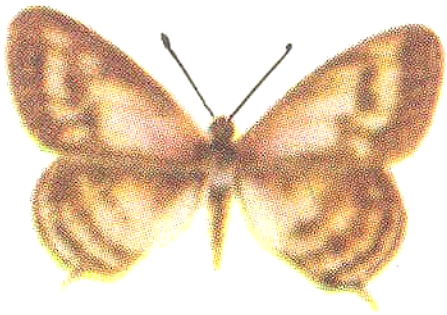
Common Evening Brown Wet Season Form

Indian Dart

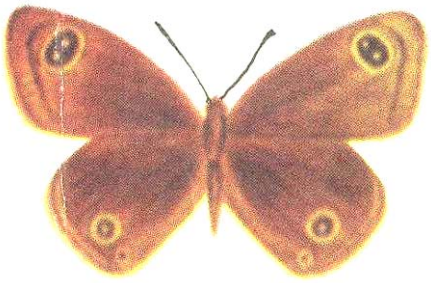
Indian Skipper



Common Silver Line



Pointed Pierrot



Large Threering

Pale Grass Blue

Exhibit 8.2: Diversity and Status of Butterfly Fauna of the MHNP Area

No	Family/Species	Common Name	Habitat	Food Plants	Status
	PIERIDAE				
1.	*Anaphaeis aurota*	The Pioneer	Widely distributed, occur usually in around cultivated fields	*Brassica oleraceaCapparis decidua*	C
2.	*Aporia leucodice*	The Himalayan Blackveins	Subtropical vegetation	*Berberis lyceum*	C
3.	*Catopsilia pomona*	The Lemon Emigrant	Orchards	Cassia fistula	C
4.	*Catopsilia pyranthe*	The Mottled Emigrant	Orchards	*Cassia spp.*	C
5.	*Catopsilia crocale*	The Common Emigrant	Orchards	*Cassia spp., Butea monosperma, Bauhinia racemosa*	C
6.	*Pieris brassicae*	The Large Cabbage White	Widely distributed, occur usually in around cultivated fields	Cruciferous such as cabbage *Cauliflower, radish mustard*	C
7.	*Pieris canidia*	*The Indian Cabbage White*	*Occur usually in around cultivated fields*	*Cruciferous such as Cabbage Cauliflower*	*C*
8.	*Eurema hecabe*	The Common Grass Yellow	Open grassy fields	*Cajanus cajan Albezia lebbeck*	C
9.	*Pontia daplidice*	The Bath White	Occur usually in around cultivated fields	*Resedaceae and many cruciferae such as Mustard and Brassica spp.*	C
10.	*Gonepteryx rhamni*	The Common Brimstone	Subtropical vegetation	*Rhamnus pentapomica Black Alder*	F
11.	*Gonepteryx aspasia*	The Lessor Brimstone	Subtropical vegetation		R
12.	*Colias erate*	The Pale Clouded Yellow	cultivated fields	*Parochetus communis Medicago sativa*	C
13.	*Colias crocea*	The Dark Clouded Yellow	cultivated fields	*Various Papilionacae Namely Lucerne*	C
14.	*Polyommatus stoliczkana*	The Common Meadow Blue	Subtropical vegetation	*Trifolium sp.*	F
	DANAIDAE				
15.	*Danaus chrysippus*	The Plain Tiger	Widely distributed, occur usually in open areas	*Calotrophis gigantean Asclepias curassavica*	C
16.	*Danaus limniace*	The Blue Tiger	Subtropical vegetation	*Wattakaka volubilis Calotrophis sp. Marsdenia tenacissima*	F

Continues...

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No	Family/Species	Common Name	Habitat	Food Plants	Status
17.	*Danaus genutia*	The Striped Tiger	Subtropical vegetation	*Cynanchum dalhousiae Ceropegia bulbosa*	F
	PAPILIONIDAE				
18.	*Papilio polyctor*	The Common Peacock	Subtropical to moist temperate	*Zanthoxylum armatum Feronia limonia Rosa spp.*	C
19.	*Papilio demoleus*	The Lime Butterfly	Orchards	*Citrus especially oranges*	F
20.	*Papilio polytes*	The Common Mormon	Subtropical to moist temperate	*Cultivated citrus, Citrus medica Murraya koenigii Zanthoxylum armatum*	F
21.	*Papilio philoxenus*	The Common Windmill	Subtropical to moist temperate	Horse chestnut *Rhododendrons*	F
	NYMPHALIDAE				
22.	*Aglais cashmirensis*	The Indian Tortoiseshell	Subtropical to moist temperate	Urtica spp	F
23.	*Argyreus hyperbius*	The Indian Fritillary	Subtropical to moist temperate	*Viola spp.*	F
24.	*Argynnis kamala*	The Common Silver-stripe	Sub tropical, shrubby	*Viola spp.*	F
25.	*Argynnis lathonia*	The Queen of Spain Fritillary	Sub tropical, shrubby	Viola spp *Urtica sp.*	F
26.	*Ariadne merione*	The Common Castor	Sub tropical, shrubby	*Ricinus communis Tragia sp.*	F
27.	*Nymphalis xanthomelus*	The Brown leg large Tortoiseshell	Sub tropical, among tall trees	Salix acmophylla	C
28.	*Phalanta phalantha*	The Leopard	Open places	Flacourtia indica Salix spp. Smilax aspera Abelia trifolia	C
29.	*Junonia almanac*	The Peacock Pansy	Grassland	Hygrophila sauriculata Barleria sp. Osbeckia sp.	F
30.	*Junonia hierta*	The Yellow Pansy	Gentle sloppy area, with thick vegetation and grass covered ground	Barleria cristata Hygrophila auriculata	C
31.	*Junonia orithya*	The Blue Pansy	Thick vegetation and grass covered ground	Plantago ovata Salvia moorcroftiana Striga sp.	C
32.	*Vanessa cardui*	The Painted Lady	Thick vegetation and grass covered ground	Carduus sp. Urtica sp. Malva sp. Artemisia sp.	C

Continues...

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No	Family/Species	Common Name	Habitat	Food Plants	Status
33.	*Vanessa indica*	The Indian Red Admiral	Thick vegetation and grass covered ground	Urtica spp.	F
34.	*Vanessa canace*	The Blue Admiral	Thick vegetation and grass covered ground	Smilex sp. Wild yams	F
35.	*Neptis hylas*	The Common Sailor	Densely ground covered hills with grasses and shrubs	Helicteres isora, Grewia sp. Mucuna sp. Flemingia sp. Bombax sp. Mappia foetda	F
36.	*Neptis mahendra*	The Himalayan Sailor	Densely ground covered hills with grasses and shrubs	Grewia sp. Mucuna sp. Flemingia sp.	F
37.	*Limenitis trivena*	The Indian White Admiral	Hilly areas scattered vegetation	Quercus sp.	F
38.	*Euthalia garuda*	The Baron	Hilly areas with scattered vegetation	Mangifolia indica Anacardium accidentale Streblus asper	F
	HESPIRIDAE				
39.	*Gomalia albofasciata*	The Common Marbled Skipper	Hilly areas with scattered vegetation	Abutilon indicum	C
40.	*Parnara guttata*	The Straight Swift	Hilly areas with thick vegetation	Saccharum officinarum	C
42.	*Gegenes nostrodamus*	The Dingy Swift	Subtropical forest with scattered undergrowth	Xanthium spp.	F
43.	*Badamia exclamationis*	The Brown Awl	Subtropical forest with scattered undergrowth	Terminalia sp.	F
	SATYRIDAE				
44.	*Satyrus parisatis*	The White Edged Rock Brown	Gentle slopes with scattered vegetation	Gymnosporia royleana	C
45.	*Lethe rohria*	The Common Tree Brown	Gentle slopes with scattered vegetation	Bamboos	F
46.	*Ypthima sakra*	The Himalayan Fivering	Hill slopes with scattered bushes	Grasses	C
47.	*Pararge schakra*	The Common Wall	Rocky gentle slopes with scattered vegetation	Grasses	F
48.	*Callirebia nirmala*	The Common Argus	Hill slopes with scattered bushes		R

Continues...

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No	Family/Species	Common Name	Habitat	Food Plants	Status
	LYCAENIDAE				
49.	*Aphnaeus ictis*	The Common Silverline	Open grassy slopes	Dendrophthoe falcate	R
50.	*Azanus ubaldus*	The Bright Babul Blue	Open areas with scattered bushes	Acacia nilotica	F
51.	*Azanus uranus*	The Dull Babul Blue	Open grassy places	Acacia modesta nilotica A. famesiana	F
52.	*Lampides boeticus*	The Pea Blue	Open areas with scattered bushes	*Crotolaria juncea Pisum sativum Trichodesma indicum Peuraria tuberosa Pisum arvense Cajanus indicus Butea frondosa*	F
53.	*Castalius rosimon*	The Common Pierrot	Open areas with scattered bushes	Zizyphus jujuba	F
54.	*Zizeeria knysna*	The Dark Grass Blue	Open grassy places	Zizeeria knysna	C
55.	*Zizeeria maha*	The Pale Grass Blue	Open grassy places	Oxalis corniculata	C

Exhibit 8.3: Distribution and Relative Abundance of the Butterfly Fauna of the MHNP

The relative abundance of the species was determined by applying the following formula:

$$\text{Relative Abundance} = \frac{\text{Number of species}}{\text{Total number of all species}}$$

No	Family / Species	Distribution								Total	Relative Abundance
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8		
1.	*Anaphaeis aurota*	16	25	7	5	2	0	8	3	66	0.024
2.	*Aporia leucodice*	0	0	0	0	0	0	23	12	35	0.012
3.	*Catopsilia pomona*	8	15	0	0	0	0	4	0	27	0.010
4.	*Catopsilia pyranthe*	12	9	0	0	0	5	5	0	31	0.011
5.	*Catopsilia crocale*	9	6	0	0	0	3	4	0	22	0.008
6.	*Pieris brassicae*	13	15	12	3	4	5	1	0	53	0.019
7.	Pieris canidia	7	15	3	2	0	0	0	0	27	0.010
8.	*Eurema hecabe*	7	8	3	6	6	2	5	0	37	0.013
9.	*Pontia daplidice*	4	7	8	2	1	4	2	3	31	0.011
10.	*Gonepteryx rhamni*	0	0	0	0	0	0	12	16	28	0.010
11.	*Gonepteryx aspasia*	0	0	0	0	0	0	2	3	5	0.002
12.	*Colias erate*	8	7	3	1	1	2	0	0	22	0.008
13.	*Colias crocea*	5	6	4	1	2	1	1	2	22	0.008
14.	*Polyommatus stoliczkana*	0	0	0	0	0	0	3	2	5	0.002
15.	*Danaus chrysippus*	6	8	7	9	14	6	14	16	80	0.029
16.	*Danaus limniace*	0	0	0	0	0	0	15	34	49	0.017
17.	*Danaus genutia*	0	0	0	0	0	0	23	45	68	0.024
18.	*Papilio polyctor*	0	0	0	0	0	12	28	34	74	0.026
19.	*Papilio demoleus*	15	12	10	7	0	0	0	8	52	0.0189
20.	*Papilio polytes*	0	0	0	0	0	12	7	18	37	0.013
21.	*Papilio philoxenus*	0	0	0	0	0	20	15	17	52	0.0189
22.	*Aglais cashmirensis*						12	15	30	57	0.020
23.	*Argyreus hyperbius*	0	0	0	0	0	0	24	26	50	0.018
24.	*Argynnis kamala*	0	0	0	0	0	0	32	22	54	0.019
25.	*Argynnis lathonia*	0	0	0	0	0	0	15	13	28	0.010
26.	*Ariadne merione*	0	0	0	0	0	0	9	12	21	0.007
27.	*Nymphalis xanthomelus*	0	0	0	0	0	0	24	30	54	0.019
28.	*Phalanta phalantha*	0	0	0	0	0	0	24	26	50	0.018
29.	*Junonia almana*	0	0	12	32	5	0	0	0	49	0.018
30.	*Junonia hierta*	0	0	0	12	23	45	0	0	80	0.031
31.	*Junonia orithya*	0	0	8	16	12	23	0	0	59	0.021
32.	*Vanessa cardui*	0	0	3	9	19	45	0	0	76	0.027
33.	*Vanessa indica*	0	0	3	9	13	22	0	0	47	0.017
34.	*Vanessa canace*	0	0	0	0	3	32	13	8	56	0.020
35.	*Neptis hylas*	0	0	0	4	8	18	14	23	67	0.024
36.	*Neptis mahendra*	0	0	0	0	13	23	11	21	68	0.024

Continues...

...Continued

No	Family / Species	Distribution								Total	Relative Abundance
		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8		
37.	*Limenitis trivena*	0	0	0	4	5	16	8	9	42	0.015
38.	*Euthalia garuda*	0	0	0	7	9	15	12	15	58	0.021
39.	*Gomalia albofasciata*	0	0	0	9	5	23	17	24	78	0.028
40.	*arnara guttata*	0	0	0	7	14	19	25	18	83	0.030
36.	*Neptis mahendra*	0	0	0	0	13	23	11	21	76	0.024
37.	*Limenitis trivena*	0	0	0	4	5	16	8	9	64	0.015
38.	*Euthalia garuda*	0	0	0	7	9	15	12	15	77	0.021
39.	*Gomalia albofasciata*	0	0	0	9	5	23	17	24	93	0.028
40.	*arnara guttata*	0	0	0	7	14	19	25	18	57	0.030
41.	*Gegenes nostrodamus*	0	0	0	0	0	12	26	38	52	0.027
42.	*Badamia exclamationis*	0	0	0	0	0	16	23	25	58	0.023
43.	*Satyrus parisatis*	0	0	0	16	22	27	12	0	63	0.028
44.	*Lethe rohria*	0	0	0	25	12	32	24	0	42	0.033
45.	*Ypthima sakra*	0	0	16	13	9	8	7	4	64	0.020
46.	*Pararge schakra*	0	0	0	0	0	14	21	17	54	0.019
47.	*Callirebia nirmala*		9	12	14	15	8	0	0	56	0.021
48.	*Aphnaeus ictis*	23	16	24	0	0	0	0	0	57	0.022
49.	*Azanus ubaldus*	10	9	9	14	0	0	0	0	68	0.015
50.	*Azanus uranus*	15	20	13	16	0	0	0	0	42	0.023
51.	*Lampides boeticus*	9	6	12	7	15	5	0	0	58	0.019
52.	*Castalius rosimon*	5	13	8	10	11	9	0	0	78	0.020
53.	*Zizeeria knysna*	21	0	15	7	9	5	0	0	83	0.020
54.	*Zizeeria maha*	27	14	9	18	0	0	0	0	76	0.024
	Total									**3,110**	

Zone 1 Settlements

Zone 2 Cultivated land

Zone 3 Degraded land/cultivation/scattered settlements

Zone 4 Subtropical forest at lower elevations- degraded

Zone 5 Subtropical forest at higher elevation- degrade

Zone 6 Invasive species *Broussonetia papyrefera* dominated vegetation

Zone 7 Subtropical pine forest

Zone 8 Subtropical semi-evergreen forest

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Appendix A:
Checklist of Plants of the MHNP

Symbols used to express the usage of plants

צ	Agricultural tools
□	Crop/vegetable/potherb
□	Fiber
□	Fodder
♠	Fruit yielding plants
☼	Fuel
ש	Grazing and browsing
☻	Medicinal
א	Ornamental
“	Others (Basket Making, Cleaning of utensils etc.)
╫	Thatching and sheltering
‡	Timber

Symbols used to show origin of the species

♪	Centrasiatic
♫	Cosmopolitan
ק	Holarctic
פ	Indian
ט	Indo-Malaysian
וֹ	Introduced or cultivated
ך	Irano-Turanian or west Mediterranean
ך	Sino-Japanese or eastern Asiatic
לֹ	Sino-Japanese-Indian
ק	Sino-Japanese-Indo-Malaysian
ע	South east Asiatic Malaysian
שׁ	South east Chinese
אָ	Tropical

No	Family wise Species	Origin	Local Name	Habit	Use
1	**Acanthaceae**				
	Barleria cristata L.	ע		Herb	
	Dicliptera roxburghiana Nees in Wall.	פ		Herb	
	Justicia adhatoda L.	ע	Bhaikar	Shrub	☻ ☼
	Justicia peploides (Nees. in Wall.) T Anders	פ		Herb	
	Peristrophe bicalyculata				
2	**Amaranthaceae**				
	Achyranthes aspera L.	אַ	Putkhanda	Herb	☻
	Alternanthera sessilis (L.) DC.	אַ		Herb	
	Amaranthus hybridus L.	וֹ		Herb	
	Amaranthus viridis L.	וֹ	Ganhar	Herb	♣
3	**Anacardiaceae**				
	Lannea coromandelica				
	Pistacia integerrima J.L. Stewart.	אֹ	Kangar	Tree	☻ ☼ ש א
	Rhus coriaria L.	ק	Luni	Shrub	" ש
4	**Apiaceae**				
	Centella asiatica (L.) Urb.	אַ	Brahmi Buti	Herb	☻
	Coriandrum sativum L.	וֹ	Dhania	Herb	☻
	Foeniculum vulgare Miller	וֹ	Sonf	Herb	☻
5	**Apocynaceae**				
	Carissa opaca Stapf ex. Haines	ע	Granda	Shrub	☻ ☼ ♠ ╫
	Nerium indicum Miller	פ	Ganira	Shrub	☻ א
	Thevetia peruviana				
6	**Araceae**				
	Arisaema sp				
	Sauromatum venosum (Aiton) Kunth	אֹ	Sup di buti	Herb	☻
7	**Araliaceae**				
	Arisaema jacquemontii Blume	אֹ		Herb	
	Hedera nepalensis var. nepalensis K. Koch	שׁ	Harbanbal	Climber	☻ ☼
8	**Aristolochiaceae**				
	Aristolochia punjabensis Lace.	??	Mayseri	Twiner	☻
9	**Asclepiadaceae**				
	Calotropis procera (Aiton) Dryand.	אַ	Ak	Herb	☻
	Periploca aphylla subsp. aphylla Decne.	ךָ	Bata	Shrub	☼ ☻ ♣
10	**Aspleniaceae**				
	Asplenium dalhousiae Hk.	NA		Herb	
11	**Asteraceae**				
	Artemisia roxburghiana var. roxburghiana Besser	אֹ		Herb	
	Bidens biternata				

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No	Family wise Species	Origin	Local Name	Habit	Use
	Blainvillea acmella (L.) Phillipson.	ו		Herb	
	Calendula arvensis Linn.	ק		Herb	
	Calendula officinalis L.	ו		Herb	
	Carthamus oxyacantha M. Bieb.	ך		Herb	☻ ☼ ╫
	Centaurea iberica				
	Cirsium arvense var. arvense L.	ק	Kandaal	Herb	
	Conyza bonariensis (L.) Cronq.	ו		Herb	
	Conyza canadensis (L.) Cronq.	ו	Paleet	Herb	
	Conyza japonica L.	ק		Herb	
	Conyza stricta Willd.	אַ		Herb	
	Echinops echinatus Roxb	ך	Kandiara	Herb	☻
	Eclipta prostrata L.	ו		Herb	☻
	Gerbera gossypina (Royle) Beauvois	א	Paktulla	Herb	"
	Helianthus annuus L.	ו	Suraj Mukhi	Herb	♣
	Lactuca bruniana (Wall. ex. DC.) Clarle	NA		Herb	
	Lactuca dissecta D. Don	♪		Herb	
	Lactuca sp.	NA		Herb	
	Launaea procumbens (Roxb.) Ramayya & Rajagopal	♪		Herb	
	Myriactis wightii DC.	♪		Herb	
	Parthenium hysterophorus L.	ו		Herb	
	Saussurea albescens (DC.) Sch. Bip.	א		Herb	
	Saussurea candicans Clarke.	NA		Herb	
	Senecio chrysanthemoides DC.	א		Herb	
	Solidago virga-aurea subsp. virga-aurea L.	ק		Herb	
	Sonchus arvensis L.	ק		Herb	
	Sonchus asper (L.) Hill.	ו		Herb	ש
	Tagetes minuta L.	ו		Herb	
	Taraxacum officinale Wigg.	NA	Hand	Herb	☻ ♣
	Veronia sp.	NA		Herb	
	Xanthium strumarium L.	ק	Chichi	Shrub	☻ ☼
12	**Berberidaceae**				
	Berberis lycium Royle.	א	Simbloo	Shrub	☼ ╫ ☻
	Berberis parkeriana C.K.Schn.	א	Kala Simbloo	Shrub	☻
	Podophyllum hexandrum Royle	ך	Bankakri	Herb	☻
13	**Bignoniaceae**				
	Incarvillea emodi Wall. ex Royle	א	Banesri	Herb	☻
14	**Bombacaceae**				
	Bombax ceiba L.	ט	Sunbal	Tree	☼ ש ǂ א ╫
15	**Boraginaceae**				

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No	Family wise Species	Origin	Local Name	Habit	Use
	Cordia myxa				
	Cynoglossum lanceolatum Forssk.	אַ		Herb	
	Ehretia acuminata var. serrata R. Br.	ע	Punna	Shrub	☼ ǂ
	Lithospermum arvense L.	ק		Herb	
	Trichodesma indicum (L.) R. Br.	אַ		Herb	
16	**Brassicaceae**				
	Brassica campestris L.	וֹ	Sarion	Herb	ש
	Brassica napus L.	וֹ	Thipper	Herb	
	Brassica officinale L.	NA	Taramira	Herb	
	Brassica oleracea var. botrytis L.	וֹ	Phul Ghobi	Herb	
	Brassica oleracea var. capitata L.	וֹ	Band Ghobi	Herb	
	Brassica oleracea var. oleracea L.	וֹ		Herb	
	Capsella bursa-pastoris (L.) Medic	ק		Herb	ש
	Cardamine impatiens L.	ק		Herb	
	Lepidium sativum L.	ק		Herb	
	Thlaspi sp.	NA		Herb	
17	**Buddlejaceae**				
	Buddleja asiatica Lour.	ע	Ladian	Shrub	☻
18	**Buxaceae**				
	Buxus papillosa				
	Sarcococca saligna (D. Don) Muell.-Arg.	אַ	Batti	Shrub	
19	**Campanulaceae**				
	Campanula benthamii Wall	פ		Herb	
20	**Cannabiaceae**				
	Cannabis sativa L.	וֹ	Bhang	Shrub	☻
21	**Caprifoliaceae**				
	Cerastium vulgatum L.			Herb	
	Lonicera arborea				
	Lonicera quinquelocalaris Hardw.	ש	Titar Batera	Shrub	▲
	Viburnum cotinifolium D. Don	אַ	Chamkat	Shrub	☻
	Viburnum foetens Decne	אַ	Guch	Shrub	♠
22	**Carryophyllaceae**				
	Silene conoidea L.	ק		Herb	
23	**Celasteraceae**				
	Gymnosporia royleana (Wall.) ex Laws	פ	Pataki	Shrub	ש
24	**Celtaceae**				
	Celtis australis L.	ק	Batkar	Tree	☻ ☼
25	**Chenopodiaceae**				
	Chenopodium album subsp. album L.	וֹ	Bathua	Herb	♣ ☻
26	**Commelinaceae**				

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No	Family wise Species	Origin	Local Name	Habit	Use
	Commelina benghalensis L.	ק		Herb	▲ ש
27	**Convolvulaceae**				
	Convolvulus arvensis L.	ק	Lehli	Twiner	
	Ipomoea carnea subsp. fistulosa Jacquem	ו	Vilayti Aak	Twiner	
	Ipomoea purpurea (L.) Roth.	וֹ		Twiner	
	Porana paniculata				
30	**Cuperessaceae**				
	Cupressus sempervirens L.	ו	Sarru	Tree	א
	Thuja orientalis L.	ו	Mor Pankh	Tree	
31	**Cuscutaceae**				
	Cuscuta reflexa var. reflexa Roxb.	ט	Nila tar	Climber	☻
32	**Cyperaceae**				
	Cyperus niveus Retz.	♪		Herb	ש
	Cyperus rotundus L.	אַ		Herb	☻ ש
	Cyperus alternifolius	NA		Herb	
33	**Dioscoraceae**				
	Dioscorea deltoidea Wall. ex Griseb.	ע	Kakar bel	Twiner	☻
34	**Ebenaceae**				
	Diospyros lotus L.	ו	Amlok	Tree	☻ ש ♠
35	**Elagnaceae**				
	Hippophae rhamnoides L.	אֹ		Shrub	
36	**Equisetaceae**				
	Equisetum debile Roxb. ex Vaucher	NA	Troto gha	Herb	☻
37	**Ericaceae**				
	Rhododendron arboreum Smith	אֹ	Batti	Shrub	
38	**Euphorbiaceae**				
	Euphorbia dabia				
	Euphorbia helioscopia L.	ק	Dodhal	Herb	☻
	Euphorbia hirta L.	אַ	Dodhal	Herb	☻
	Euphorbia indica Lam.	אַ		Herb	
	Euphorbia prolifera Ham	שׂ		Herb	
	Euphorbia prostrata Ait.	ו	Doodi Buti	Herb	☻
	Euphorbia pulcherrima Willd. ex Klotsch.	וֹ		Herb	
	Euphorbia ramosissimum Desf.	NA		Herb	
	Euphorbia thymifolia L.	אַ		Herb	
	Euphorbia wallichii Hook. f.	ךָ		Herb	
	Mallotus philippensis (Lam.) Muell.-Arg.	ט	Kameela	Tree	☻ ☼
	Phyllanthus emblica L.	ט	Aamla	Tree	☻ ☼
39	**Fagaceae**				

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No	Family wise Species	Origin	Local Name	Habit	Use
	Quercus dilatata Royle	NA	Barungi	Tree	☼ ש ▲
	Quercus glauca var. glauca Thunb.	ל	Bareen	Tree	☼ ש ▲
	Quercus leucotrichophora A. Camus	א	Rhin	Tree	☼ ש ▲
40	**Flacourtiaceae**				
	Flacourtia indica				
	Xylosma longifolia				
41	**Fumariaceae**				
	Fumaria indica (Haussk.) Pugsley	ך		Herb	
42	**Gentianaceae**				
	Gentiana argentea (D. Don) C.B. Clarke	א		Herb	
	Gentiana sp.	NA		Herb	
	Gentianella angustiflora H. Smith	א		Herb	
	Gentianella azurea (Bunge) Holub	ק		Herb	
	Swertia chirayita (Roxb. ex Fleming) Karsten	א	Chirayata	Herb	☻
43	**Geraniaceae**				
	Geranium nepalense Sweet	ך		Herb	
	Geranium rotundifolium L.	ק		Herb	
	Geranium wallichianum D. Don ex Sweet	א	Rattan Jot	Herb	☻
44	**Helveliaceae**				
	Morchella esculenta (L.) Pers ex. Fr.	NA	Gucchi	Mushroom	♣
45	**Hippocastanaceae**				
	Aesculus indica (Colebr. ex Cambess) Hook.	א	Banakhrot	Tree	☻ ☼ ▲
46	**Hypericaceae**				
	Hypericum dyerii Rehder	א		Shrub	
	Hypericum oblongifolium Choisy	א	Kala Mannu	Shrub	
	Hypericum perforatum L.	ק	Chitta Mannu	Shrub	
47	**Juglandaceae**				
	Juglans regia var. kamaonia L.	א	Akhrot	Tree	☻ ☼ ♯ ╫ ♠ צ
48	**Labiatae**				
	Ajuga bracteosa var. bracteosa Wall.	ק	Kauri booti	Herb	
	Ajuga bracteosa var. densiflora Wall.	א	Kauri booti	Herb	
	Anisomeles indica				
	Calamintha umbrosa (M. Bieb) Fisch. & Mey	♪		Herb	
	Lamium amplexicaule var. amplexicaule L.	ק	Muntkobra	Herb	

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No	Family wise Species	Origin	Local Name	Habit	Use
	Mentha longifolia (L.) Hudson		Jangli Poodna	Herb	☻ ♣
	Mentha royleana Benth.	א	Poodna	Herb	☻ ♣
	Micromeria biflora var. biflora (Buch.-Ham. ex D. Don) Benth.	פ		Herb	
	Nepeta sp.	NA		Herb	
	Ocimum basilicum L.	ו	Naz bow	Herb	☻
	Otostegia limbata (Benth.) Boiss.	א	Chitta Jand	Shrub	☻
	Plectranthus rugosus Wall. ex. Bth.	פ		Herb	
	Salvia moorcroftiana Wall. ex Benth.	א		Herb	
	Salvia officinalis	NA	Kathula	Herb	♣
	Scutulleria sp.	NA		Herb	
49	**Leguminoseae**				
	Acacia catechu (L.f.) Wild.	פ	Khair	Tree	☻ ☼ ש ǂ ▲
	Acacia modesta Wall.	ף	Phullahi	Tree	☻ ש ╫ ☻ ☼ ש
	Acacia nilotica subsp. indica (L.) Willd.	פ	Kikar	Tree	☻ ☼ש ╫
	Albizia lebbeck (L.) Benth.	ט	Sareen	Tree	☻ ☼ ש ǂ צ
	Albizia odoratissima (L. f.) benth.	פ	Safed Sareen	Tree	☻ ☼ ש ǂ צ
	Albizia procera (Roxb.) Benth.	פ	Kala Sareen	Tree	☻ ☼ ש ǂ צ
	Astragalus leucocephalus Grah. ex Benth.	א		Herb	
	Astragalus polyacanthus Royle ex Benth.	א		Herb	
	Bauhinia variegata L.	פ	Kuliar	Tree	ש ♣ צ
	Butea monopserma				
	Cassia fistula L.	ו	Amaltas	Tree	☻ ǂ צ
	Cassia obtusifolia Linn.	??		Shrub	
	Cassia occidentalis L.	ו		Shrub	
	Dalbergia sissoo Roxb. ex DC.	א	Tali	Tree	☼ ǂ
	Desmodium gangeticum				
	Dumasia villosa var. villosa DC.	אַ		Herb	
	Erythrina suberosa				
	Flemingia bracteata (Roxb.) Wight	ע		Herb	
	Glycine max (L.) Merr.	ו	Soya bean	Herb	♣
	Indigofera heterantha var. Gerardiana Wall.	ף	Kainthi	Shrub	☻ ☼ ש ╫
	Lathyrus aphaca L.	ק		Herb	
	Lespedeza juncea (L. f.) Pers.	ף		Herb	
	Lotus corniculatus var. corniculatus L.	ק		Herb	
	Medicago minima (L.) Bartalini	ק	Mayseri	Herb	ש ♣
	Medicago sativa L.	ו	Mayseri	Herb	♣

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No	Family wise Species	Origin	Local Name	Habit	Use
	Melilotus parviflora Desf.	ק	Mayseri	Herb	
	Mimosa himalayana Gamble	א	Rali	Shrub	☻ ש
	Pisum sativum L.	ו	Mattar	Herb	♣
	Pongamia pinnata				
	Robinia pseudacacia L.	ו	Roubinia	Tree	☼ ש ╫
	Rynchosia minima (L.) DC.	ק		Herb	
	Sesbania sessban				
	Trifolium repens L.	ק	Shatal	Herb	
	Trigonella emodi Benth.	♪	Mathee	Herb	
	Trigonella foenum-graecum L.	ו	Mathee	Herb	
	Vicia sativa var. sativa L.	ו	Phulliatan	Herb	
	Vigna aconitifolia (Jacq.) Marchal	ו	Moth	Herb	♣
	Vigna mungo Hepper	ו	Mung	Herb	♣
	Vigna radiata (L.) Wilezek.	ו	Mash	Herb	♣
50	**Liliaceae**				
	Agave cantula Roxb.	ו	Keora	Herb	☻
	Allium cepa L.	ו	Piaz	Herb	☻ ♣
	Allium griffithianum L.	♪	Muniata	Herb	
	Allium sativum L.	ו	Thoom	Herb	☻ ♣
	Asparagus adscendens Roxb.	NA		Shrub	ש
	Asparagus gracilis				
	Gloriossa superba				
	Scilla griffithii				
	Tulipa stellata Hook.f.	א	Mootrata	Herb	☻
51	**Lytheraceae**				
	Woodfordia fruticosa (L.) Kurz.	אִ	Dhavi	Shrub	
52	**Malvaceae**				
	Abelmoschus esculentus (L.) Moench	ו	Bhindi	Herb	♣
	Malva sylvestris var. sylvestris L.	ק	Sonchal	Herb	
	Malvastrum coromandelianum (L.) Garcke			Herb	
	Sida cordifolia L.	אִ		Herb	☻
53	**Meliaceae**				
	Cederela serrata Royle.	א	Dravi	Tree	☻ ǂ ╫
	Cederela toona Roxb. ex Wild	א	Tun	Tree	☻ ☼ ǂ ╫
	Melia azedarach L.	ו	Dharek	Tree	☻ ☼ ☻ ש ǂ ╫
54	**Menispermaceae**				
	Cissampelos pareira var. hirsuta L.	אִ	Ghorsum	Herb	☻
	Tinospora cordifolia (DC.) Miers.	ט	Glo	Herb	
55	**Moraceae**				
	Broussonetia papyrifera (L.) L'H {rit. ex Vent.	ו	Ban toot	Tree	☼ ש

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No	Family wise Species	Origin	Local Name	Habit	Use
	Ficus auriculata Lour.	ק	Dhussi	Tree	☼ ש
	Ficus benghalensis L.	פ	Bohr	Tree	☼ ש ☻ ‡ ╫
	Ficus carica subsp. carica L.	ק	Phagwar	Tree	☼ ש ☻
	Ficus palmata subsp. virgata Forssk.	ך	Injeer	Tree	☼ ש ♣
	Morus alba L.	ו	Tut	Tree	☼ ש ‡ ♣ ╫
	Morus laevigata Wall ex. Brandis		Karrun	Tree	☼ ש ‡
	Morus nigra L.	ו	Kala tut	Tree	☼ ש ‡
	Morus serrata Roxb.	א	Tut	Tree	☼ ש ‡
56	**Muscaceae**				
	Musca sapientum L.	ו	Kaila	Tree	♣
57	**Myrsinaceae**				
	Myrsine africana L.	אַ	Khukhal	Shrub	☻ ☼ ש ╫
58	**Myrtaceae**				
	Psidium guajava L.	ו	Amrud	Tree	♠ ☼ ש
	Syzygium cumini (L.) Skeels	ט	Jaman	Tree	♠
59	**Nyctaginaceae**				
	Alternanthera pungens Kunth	ו		Herb	
	Boerhavia diffusa L.	אַ	Itsit	Herb	☻
	Boerhavia procumbens (Roxb) Hk.F	NA		Herb	
	Boerhavia repens L	NA		Herb	
60	**Oleaceae**				
	Jasminum humile L.	א		Shrub	
	Jasminum mesneyi Hance	ו		Shrub	
	Jasminum officinale L.	ק	Safed Chanbeli	Shrub	☻
	Jasminum sambac (L) Ait.	ו	Motia	Shrub	א
	Olea ferruginea Royle	א	Zaitoon	Tree	☻ ☼ ש ╫
61	**Onagraceae**				
	Oenothera rosea L'H {rit. ex Aiton}	ו		Herb	
62	**Oxalidaceae**				
	Oxalis corniculata L.	ק	Khatkurla	Herb	☻
63	**Palmaceae**				
	Phoenix sylvestris Roxb.	פ	Khajur	Tree	
64	**Pinaceae**				
	Pinus roxburghii Sarg.	א	Chil	Tree	☻ ☼ ‡ א ╫
	Pinus wallichiana A.B. Jackson	א	Banjar	Tree	☼ ‡ א ╫
65	**Plantaginaceae**				
	Plantago lanceolata L.	ק	Ispaghol	Herb	☻
	Plantago major L.	ק		Herb	
66	**Poaceae**				
	Andropogan pertusus	NA		Herb	

Continues…

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No	Family wise Species	Origin	Local Name	Habit	Use
	Apluda mutica var. mutica L.	ט		Herb	ש ▲
	Aristida adscensionis L.	אַ		Herb	▲ ש
	Aristida depressa	NA		Herb	▲ ש
	Arundo donax L.	ק		Shrub	"
	Avena barbata Pott ex Link	ק		Herb	▲ ש
	Avena fatua var. fatua L.	ק		Herb	
	Avena sativa L.	וֹ	Joe	Herb	♣ ש ▲
	Bothriochloa pertusa				
	Cenchrus ciliaris L.	אַ		Herb	▲ ש
	Cenchrus pennisetiformis Hochst & Steud	ך		Herb	▲ ש
	Chrysopogan montanus				
	Cymbopogon jwarancusa (Jones) Schultes	פ	Khavi	Herb	☻ ▲ ש
	Cynodon dactylon (L) Pers.	♫	Khabbal	Herb	☻ ש
	Dactyloctenium aegyptium (L) P. Beauv.	אַ	Madhana	Herb	ש
	Dendrocalamus strictus				
	Desmostachya bipinnata (L) Stapf	אַ		Herb	ש
	Dichanthium annulatum (Forssk) Stapf	אַ	Palwan	Herb	▲ ש
	Digitaria bicornis (Lamk) Roem & Schult. ex Loud	אַ		Herb	▲ ש
	Digitaria ciliaris (Retz) Koel.	אַ		Herb	▲ ש
	Echinochloa colona (L) Link	אַ	Shwank	Herb	▲ ש
	Eragrostis poaeoides Beauvois	ק		Herb	▲ ש
	Heteropogon contortus (L) Beauvois ex Roemer & Schultes	אַ	Saryala	Herb	▲ ש
	Hordeum vulgare var. nudum L.	וֹ		Herb	♣ ש
	Imperata cylindrica var. cylindrica (L) Beauvois	ק	Patri Kha	Herb	▲ ש
	Oplismenis burmannii	NA		Herb	▲ ש
	Origanum vulgare L.	ק		Herb	ש
	Panicum sp.	NA		Herb	ש
	Paspalidium flavidum (Retz) A. Camus	ע		Herb	ש
	Penisetum divisum (Gmel) Henr.	NA		Herb	♣ ▲
	Pennisetum orientale				
	Phragmites karka (Retz) Trin. Ex Steudel	ט	Narr	Shrub	♣ ▲ ש
	Poa annua L.	ק		Herb	▲ ש
	Poa pratensis L.	ק		Herb	▲ ש
	Polypogon monspeliensis (L) Desf.	ק		Herb	▲ ש
	Setaria glauca (L) Beauvois	אַ		Herb	▲ ש

Continues…

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No	Family wise Species	Origin	Local Name	Habit	Use
	Setaria italica (L) Beauvois	ו	Kangni	Herb	♣ ▲ ש
	Setaria tomentosa				
	Sorghum bicolor (L) Moench	ו	Chari	Herb	♣ ▲
	Sorghum halepense (L) Beauvois	ו	Barru	Herb	
	Themeda anathera (Nees ex Steudel) Hackel	א		Herb	▲ ש
	Triticum aestivum L.	ו	Kanak	Herb	
	Zea mays L.	ו	Makai	Herb	♣ ▲
67	**Polygalaceae**				
	Polygala abyssinica R. Br. ex Fresen.	אִ		Herb	
68	**Polygonaceae**				
	Arabidopsis amplexicaulis Edgew.	א		Herb	
	Polygonum 2sp.	NA		Herb	
	Polygonum barbatum L.	אִ		Herb	
	Polygonum glabrum Willd.	אִ		Herb	
	Polygonum oriantale L.	♪		Herb	
	Polygonum plebeium R.Br	אִ		Herb	
	Polygonum sp.	NA		Herb	
	Rumex chalepensis D. Don	ך		Herb	
	Rumex hastatus D. Don	ש		Herb	
	Rumex nepalensis Spreng.	ק		Herb	
69	**Primulaceae**				
	Anagallis arvensis var arvensis L.	ק		Herb	
	Anagallis arvensis var coerulea Green & Godr	ק		Herb	
	Androsace rotundifolia var. rotundifolia Hardw.	א		Herb	
70	**Pteridaceae**				
	Adiantum capillus-veneris L.	NA		Herb	☻
	Adiantum incisum Forssk.	NA		Herb	
	Adiantum sp.	NA		Herb	
	Cheilanthes sp.	NA		Herb	
	Dryopteris pallida Formin	NA		Herb	א
	Pteris cretica L.	NA		Herb	
	Pteris vitata L.	NA		Herb	
71	**Punicaceae**				
	Punica granatum L.	ק	Dani	Tree	☻ ♠ צ ╫
72	**Ranunculaceae**				
	Aconitum heterophyllum Wall.	א		Herb	
	Anemone vitifolia Buch. -Ham. ex DC.	א		Herb	
	Aquilegia pubiflora Wall. ex Royle	א		Herb	
	Clematis gouriana Roxb. ex. DC.	ל		Herb	

Continues…

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No	Family wise Species	Origin	Local Name	Habit	Use
	Clematis grata Wall.	א		Herb	
	Clematis graveolans Lindl.	א		Herb	
	Clematis montana var. montana Buch. –Ham. ex DC.	ך		Herb	
	Ranunculus hirtellus Royle ex D. Don	ך		Herb	
	Ranunculus laetus Wall. ex D. Don	א		Herb	
	Thalictrum punduanum Wall.	א		Herb	
73	**Rhamnaceae**				
	Sageretia brandrethiana				
	Rhamnus virgatus Roxb.	ש		Shrub	
	Zizyphus jujuba Lam.	ק	Ber	Tree	
	Zizyphus mauritiana Lam.	אִ	Ber	Tree	
74	**Rosaceae**				
	Cotoneaster sp.	NA	Luni	Shrub	״ צ ▲
	Duchesnea indica var. microphylla (Andr.) Focke	א		Herb	
	Eriobotrya japonica (Thunb.) Lindl.	ו		Tree	╫ ♠
	Fragaria nubicola Lindl. ex Lacaita	ש		Herb	
	Malus pumila Mill.	ו	Seb	Tree	♠ ☼
	Prunus amygdalus Batsch	ו		Tree	
	Prunus armeniaca L.	ך	Hari	Tree	☻ ש ╫ ♠ ☼
	Prunus cornuta Wall ex. Royle	ש	Kala Kanth	Tree	ש ǂ צ ☼
	Prunus domestica L.	ו	Alucha	Tree	♠ ☼ ▲
	Prunus persica (L.) Batsch	ו	Alubokhara	Tree	♠ ☼
	Pyrus communis L.	ו		Tree	♠
	Pyrus pashia Buch.-Ham. ex D. Don	ש	Batangi	Tree	☻ ☼ ש ╫ צ
	Pyrus sinensis L.	NA	Nakh	Tree	♠ ☼
	Rosa brunonii Lindl.	ש	Tarni	Climber	╫ ״
	Rosa indica L.	ו	Ghulab	Shrub	א ╫
	Rosa macrophylla var. macrophylla Lindl.	א	Tarni	Shrub	
	Rosa moschata J. Herrmann	ו	Tarni	Shrub	
	Rubus ellipticus Smith	ל	Aakha	Shrub	♠
	Rubus ulmifolius Schott.	NA	Bagwan	Shrub	
	Spiraea cantoniensis Lour.	ו		Shrub	
75	**Rubiaceae**				
	Galium acutum Edgew.	א		Herb	
	Galium aparine var. aparine L.	ק		Herb	
	Gallium elegans Wall.	ש		Herb	
	Randia tetrasperma (Roxb.) Benth. & Hook. f. ex Brandis	א	Kavvi	Shrub	☻ ש
	Rubia cordifolia L.	NA		Herb	

Continues…

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No	Family wise Species	Origin	Local Name	Habit	Use
	Wendlandia exserta (Roxb) DC.	פ	Ukkan	Shrub	
76	**Rutaceae**				
	Citrus aurantium L.	ו	Nimboo	Tree	☻ א ♠ ╫
	Zanthoxylum armatum DC.	ך		Shrub	☻ "
77	**Salicaceae**				
	Populus alba L.	ו		Tree	☼ ש ‡ ╫
	Populus caspica Bornm.	♪		Tree	☼ ש ‡ ╫
	Populus ciliata Wall. Ex Royle	ש	Palach	Tree	☼ ש ‡ ╫
	Populus deltoides				
	Populus nigra L.	ו		Tree	☼ ש ‡ ╫
	Salix acmophylla Boiss.	ך		Tree	☻ ☼ ‡
	Salix babylonica L.	ו		Tree	
	Salix tetrasperma Roxb	ט		Tree	☻ ☼ ש ‡
	Sapotaceae				
78	Reptonia buxifolia				
79	**Sapindaceae**				
	Dodonaea viscosa (L.) Jacq.	אַ	snatha	Shrub	☼ צ ╫
	Sapindus mukorossi Gaertn.	ך	Retha	Tree	☻ ‡
80	**Saxifragaceae**				
	Bergenia ciliata forma ligulata (Haw.) Sternb.	א		Herb	☻
81	**Scrophulariaceae**				
	Scrophularia decomposita Royle ex Benth.	א		Herb	
	Verbascum thapsus L.	ק	Loot Sela	Herb	☻
	Veronica beccabunga L.	ק		Herb	
	Veronica biloba L.	♪		Herb	
	Veronica deltigera Wall. ex Benth.	א		Herb	
	Veronica persica Poir.	ק		Herb	
	Veronica polita Fries	ק		Herb	
	Veronica sp.	NA		Herb	
82	**Simarubaceae**				
	Ailanthus altissima (Miller) Swingle	ו		Tree	☼ ש א
83	**Smilaceae**				
	Smilax aspera L.	אַ		Twiner	
84	**Sterculiaceae**				
	Dombeya sp.				
	Helecteris isora				
85	**Solanaceae**				
	Capsicum annuum var. annuum L.	ו	Mirch	Herb	♣ ☻
	Datura stramonium L.	ו	Datura	Shrub	☻
	Lycopersicum esculentum Miller	ו	Tamatar	Herb	א
	Solanum melongena L.	ו	Baingan	Shrub	♣

Continues…

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No	Family wise Species	Origin	Local Name	Habit	Use
	Solanum nigrum L.	ו	Kachmach	Herb	☻ ♣
	Solanum surattense Burm. f.	ע	Mokri	Herb	☻
	Solanum tuberosum Linn.	ו	Aalu	Herb	♣
	Withania somnifera (L.) Dun.	ק	Asgand	Shrub	☻
86	**Tiliaceae**				
	Corchorus olitorius L.	פ		Herb	
	Grewia optiva J. R. Drumm. ex Burret	א	Dhaman	Tree	▓ ☼ ש ǂ ╫
87	**Urticaceae**				
	Debregeasia salicifolia (D. Don) Rendle	ך	Sindwari	Shrub	
	Urtica dioica L.	ק	Bichu Buti	Herb	
88	**Valerianaceae**				
	Valeriana jatamansii Jones	ש		Herb	
89	**Verbenaceae**				
	Callicarpa macrophylla Vahl.	ט	Neel Pathan	Tree	☻
	Lantana camara L				
	Nyctanthes arbor-tristis				
	Verbena officinalis L.	ק		Herb	☻
	Vitex negundo L.	אִ	Marveen	Shrub	☻
90	**Violaceae**				
	Viola canescens Wall.	אֹ	Banafsha	Herb	☻
91	**Vitaceae**				
	Vitis trifolia				
	Vitis vinifera L.	ו	Dakh	Vine	♣

Appendix B:
Invasive Plant Species

List of preliminarily recognized invasive plant species in Pakistan is given in **Exhibit B.1**.

Exhibit B.1: Preliminarily Recognized Invasive Plant Species in Pakistan

Scientific name	Family	English name	Local name	Origin	Worst affected areas
Broussonetia papyrifera	Moraceae	Paper mulberry	Gunli toot	South East Asia.	Islamabad-Rawalpindi, from Lahore to Peshawar and in northern Pakistan
Prosopis juliflora	Mimosaceae	Mesquite	Kikar	West Indies & Mexico	The riparian forest of Acacia nilotica in Sindh
Eichhornia crassipes	Pontederiaceae	Water hyacinth	Gul-e-Bakauli	Amazon basin, S. America	Sindh and Punjab, and in the water bodies of Pakistan
Salvinia molesta	Salviniaceae	Kariba weed water fern, Salvinia	Not available	South America	In the wetlands and irrigation channels of Thatta
Lantana camara	Verbenaceae	Lantana	Panch phuli	Americas	In and around Islamabad
Parthenium hysterophorus	Asteraceae	White top, Congress grass, Carrot grass	Not available	Mexico, Central America	Islamabad and environs, where it is highly invasive
Cannabis sativa	Cannabaceae	Hemp	Bhang	Central and Western Asia	It invades waste areas in northern Punjab and NWFP
Pistia stratiotes	Araceae	Water cabbage	Jal kumbi	Old and new World tropics	In water reservoirsand the edges of large lakes
Ipomoea carnea	Convolvulaceae	Railway creeper	Railway creeper	Tropical America	In southern Sindh and Indus delta
Emex spinosa	Polygonaceae	Prickly dock	Kafir kanda	Mediterranean region	In the cooler parts of the country
Galium aparine	Rubiaceae	Catchweed bedstraw	Not available	Europe	Distributed in Pakistan from plains to 120,00 feet
Xanthium strumarium	Asteraceae	Cocklebur	Puth kando	A New World species	In most parts of Pakistan and in the rangelands
Leucanea leucocephala	Mimosaceae	Ipil Ipil	Not available	Central America	In parts of Pakistan, mainly in Punjab
Lolium temulentum	Poaceae	Darnel, Rye grass	Dhanak	Mediterranean region	Throughout Pakistan from the plains to 2,000 feet

Source: Fourteen invasive plant species were preliminary recognized from Pakistan in the one-day workshop on Alien Invasive Species in Pakistan, 17 September 1999, NARC Islamabad.

Note: Text in gray color indicates the invasive plant species reported in MHNP

Appendix C: Checklist of Medicinal Plants of the MHNP

Herb

No.	Herb Species	Family Name
1.	*Achyranthes aspera* L.	AMARANTHACEAE
2.	*Adiantum capillus-veneris* L.	PTERIDACEAE
3.	*Amaranthus viridis* L.	AMARANTHACEAE
4.	*Argyrolobium roseum* Camb.) Jaub & Spark.	PAPILIONACEAE
5.	*Artemesia scoparia* Walds & Kit	ASTERACEAE
6.	*Asparagus adscendens* Roxb.	LILIACEAE
7.	*Boerhaavia procumbens* Banks ex Roxb.	NYCTAGINACEAE
8.	*Calendula arvensis* L.	ASTERACEAE
9.	*Cannabis sativa* Linn.	CANNABACEAE
10.	*Carthamus oxyacantha* M. Bieb.	ASTERACEAE
11.	*Chenopodium album L.*	CHENOPODIACEAE
12.	*Chenopodium ambrosioides* L.	CHENOPODIACEAE
13.	*Cissampelos pareira* Linn.	MENISPERMACEAE
14.	*Clematis grata* Wall.	RANNUNCULACEAE
15.	*Convolvuluus arvensis* L.	CONVOLVULACEAE
16.	*Conyza canadensis* (L.) Cronquist	ASTERACEAE
17.	*Cuscuta reflexa* Roxb.	CUSCUTACEAE
18.	*Cynodon dactylon* (L.) Pers.	POACEAE
19.	*Datura stramonium* L.	SOLANACEAE
20.	*Dioscorea deltoidea* Wall. ex Griseb.	DIOSCORACEAE
21.	*Euphorbia helioscopia* L.	EUPHORBIACEAE
22.	*Fumaria indica* (Hussk.) Pugsley	FUMARIACEAE
23.	*Lactuca serriola L.*	ASTERACEAE
24.	*Lathyrus aphaca L.*	PAPILIONACEAE
25.	*Leucas capitata* Desf.	LABIATAE
26.	*Malva neglecta* Wall.	MALVACEAE
27.	*Malvastrum coromandelianum* (L.) Garcke	MALVACEAE
28.	*Melilotus indicus*	PAPILIONACEAE
29.	*Mentha royleana* L.	LABIATAE
30.	*Micromeria biflora* (Buch.-Ham. ex S. Don.) Benth.	LABIATAE
31.	*Oxalis corniculata* L.	OXALIDACEAE
32.	*Plantago lanceolata L.*	PLANTAGINACEAE
33.	*Plantago major* Linn.	PLANTAGINACEAE
34.	*Plumbago zeylanica* L.	PLUMBAGINACEAE

Continues...

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No.	Herb Species	Family Name
35.	*Polygonum plebejum* R. Br.	POLYGONACEAE
36.	*Rumex chelapensis* Mill.	POLYGONACEAE
37.	*Salvia moorcroftiana* Wall. ex Benth.	LABIATAE
38.	*Sauromatum venosum* (Ait)Schott	ARACEAE
39.	*Saussurea heteromalla* (D. Don)Hand.-Mazz.	ASTERACEAE
40.	*Sida cordata* (Burm.F.)Boiss.	MALVACEAE
41.	*Silene conoidea L.*	CARYOPHYLLACEAE
42.	*Silybum marianum (L.) Gaertn.*	ASTERACEAE
43.	*Sisymbrium irio* L.	BRASSICAEAE
44.	*Smilax aspera* L.	SMILACACEAE
45.	*Solanum americanum* Mill.	SOLANACEAE
46.	*Solanum surratense* Burm.	SOLANACEAE
47.	*Sonchus arvensis* L.	ASTERACEAE
48.	*Stellaria media* (L.) Cylillo	CARYOPHYLLACEAE
49.	*Taraxacum officinalis* Weber	ASTERACEAE
50.	*Tribulus terrestris* (Linn.)	ZYGOPHYLLACEAE
51.	*Trichodesma indica* (L.) R. Br.	BORAGINACEAE
52.	*Verbascum thapsus* L.	SCROPHULARIACEAE
53.	*Vetiveria zizanioides* (L.) Nash	POACEAE
54.	*Vicia sativa* L.	PAPILIONACEAE
55.	*Viola canescans* Wall. ex Roxb.	VIOLACEAE

Shrubs

No.	Shrub Species	Family Name
1.	*Aerva sanguinolenta* (L.) Blume	AMARANTHACEAE
2.	*Barleria cristata* L.	ACACNTHACEAE
3.	*Berberis lycium* Royle	BERBERIDACEAE
4.	*Buxus papillosa* C.K. Schm.	BUXACEAE
5.	*Calotropis procera ssp. Hamiltonii* (Wight) Ali	ASCLEPIADACEAE
6.	*Carissa opaca* Stapf ex Haines	APOCYNACEAE
7.	*Dendrocalamus strictus* (Roxb.) Nees.	POACEAE
8.	*Dodonaea viscosa* (L.) Jacq.	SAPINDACEAE
9.	*Euphorbia royleana* Boiss.	EUPHORBIACEAE
10.	*Jasminum humile* L.	OLEACEAE
11.	*Jasminum officinale* L.	OLEACEAE
12.	*Justicia adhatoda* L.	ACANTHACEAE
13.	*Lantana camara* L.	VERBENACEAE
14.	*Lantana indica* Roxb.	VERBENACEAE
15.	*Myrisine africaca* L.	MYRSINACEAE
16.	*Nerium indicum* Miller	APOCYNACEAE
17.	*Opuntia monoacantha* (Willd.) Ham.	CACTACEAE
18.	*Otostegia limbata* (Benthm.) Boiss.	LABIATAE
19.	*Rosa brunonii* Lindl.	ROSACEAE
20.	*Rubus fructicosus*	ROSACEAE
21.	*Vitex negundo* L.	VERBENACEAE
22.	*Withania sominifera* (L.) Dinal.	SOLANACEAE
23.	*Woodfordia fruticosa* (L.) S. Kurz	LYTHRACEAE
24.	*Zizyphus mauritiana* Lam.	RHAMNACEAE
25.	*Zizyphus nummularia*	RHAMNACEAE

Trees

No.	Tree Species	Family Name
1.	*Acacia modesta* Wall.	MIMOSACEAE
2.	*Acacia catechu* (L.f.) Willd.	MIMOSACEAE
3.	*Acacia nilotica* ssp. *indica* (Benth.) Brenan	MIMOSACEAE
4.	*Albizzia lebbeck* (L.) Benthm.	MIMOSACEAE
5.	*Bauhinia variegata* L.	CAESALPINACEAE
6.	*Bombax ceiba* L.	BOMBACACEAE
7.	*Butea monosperma* (Lam.) O.Kuntze	PAPILIONACEAE
8.	*Cassia fistula* L.	CAESALPINACEAE
9.	*Dalbergia sissoo* Roxb. ex DC.	PAPILIONACEAE
10.	*Ficus bengalensis* L.	MORACEAE
11.	*Ficus religiosa* Linn.	MORACEAE
12.	*Ficus virgata* Wall. ex Roxb.	MORACEAE
13.	*Flacourtia indica* (Burm.) Merr.	FLAUCORTIACEAE
14.	*Mallotus philippensis* (Lam.)Muell.-Arg	EUPHORBIACEAE
15.	*Maytenus royleanus* (Wall. ex Lawson) Cufodont	CELASTRACEAE
16.	*Melia azedarach* Linn.	MELICEAE
17.	*Mimosa rubicaulis* Lam. subsp *himalayana*	MIMOSACEAE
18.	*Morus alba* Linn.	MORACEAE
19.	*Nannorhops ritcheana* (Griff.) Aitchison.	PALMACEAE
20.	*Olea ferruginea* Royle	OLEACEAE
21.	*Phoenix sylvestris* (L.) Roxb.	PALMACEAE
22.	*Phyllanthus emblica L.*	EUPHORBIACEAE
23.	*Pinus roxburghii* Sargent	PINACEAE
24.	*Punica granatum* L.	PUNICACEAE
25.	*Pyrus pashia* Buch.-Ham ex D. Don	ROSACEAE
26.	*Quercus luecotrichophora* A. Camus	FAGACEAE
27.	*Ricinis communis* Linn.	EUPHORBIACEAE

Appendix D: Checklist of the Birds Found in the MHNP

Exhibit D.1: Key for Location, Status, and Seasonality Made According to Pyhala (1999) and according to Wards (1994) in case of additional species

+	Recorded only at Margalla hills	NBR	Non breeding resident
A	Abundant	SB	Summer breeder
Re	Regular	WV	Winter visitor
Ir	Irregular year round visitor	V	Year round visitor
C	Common	SV	Summer visitor
F	Frequent	PM	Passage migrant (spring, autumn or double)
O	Occasional	SPM	Spring passage migrant
S	Scarce	SpV	Spring visitor
R	Rare	APM	Autumn passage migrant
Va	Vagrant	Small case	All above in small numbers

See the literature cited for the definitions of the terms used below

Exhibit D.2: Complete Checklist of the Recorded Birds of the MHNP by Different Authors

No	Common Name	Scientific name	Status	Distribution
	Order Podicipediformes			
	Family Podicipedidae			
1.	Little Grebe/Dabchick	*Tachybaptus ruficollis*	C	WV/RB
2.	Great Crested Grebe	*Podiceps cristatus*	F	WV
3.	Red necked Grebe	*Podiceps grisegena*	R	WV
4.	Black necked Grebe/Eared Grebe	*Podiceps nigricollis*	O	WV
	Order Pelecaniformes			
	Family Phalacrocoracidae			
5.	Great/Eurasian Cormorant	*Phalacrocorax carbo*	C	Re/WV
6.	Little/Javanese Cormorant	*Phalacrocorax niger*	Va	Re/WV
	Family Anhingidae			
7.	Darter/Snake Bird	*Anhinga melanogaster*	R	WV
	Order Ciconiiformes			
	Family Ardeidae			
8.	Eurasian Bittern	*Botaurus stellaris*	R	WV
9.	Little Bittern	*Lxobrychus minutus*	R	PM
10.	Yellow Bittern/Chinese Little Bittern	*Lxobrychus sinensis*	Va	
11.	Cinnamon/Chestnut Bittern	*Lxobrychus cinnamomeus*	F	SV/WV
12.	Black Bittern/Yellow throated *Bittern*	*Lxobrychus flavicollis*	S	SV
13.	Night Heron/Black crowned Night Heron	*Nycticorax nycticorax*	C	SB/WV
	Order Ciconiiformes			
	Family Ardeidae			
14.	Indian Pond Heron/Paddy Bird	*Ardeola grayii*	C	RB
15.	Cattle Egret (Buff backed Heron)	*Bubulcus ibis*	C	RB
	Order Accipitriformes			
	Family Accipitridae			
16.	Crested Honey Buzzard	*Pernis ptilorhynchus*	C	PM
17.	Black winged/Black shouldered Kite	*Elanus caeruleus*		RB
18.	Black/Pariah Kite	*Milvus migrans*	A	RB
19.	Short toed Eagle	*Circaetus gallicus*	S	WV
20.	Crested Serpent Eagle	*Spilornis cheela*		
21.	Goshawk	*Accipiter gentilis*	O	WV
22.	Besra Sparrow Hawk	*Accipiter virgatus*		
23.	Eurasian Sparrow Hawk *melaschistos*	*Accipiter nisus*	F	WV
24.	Indian Sparrow Hawk/Shikra	*Accipiter badius cenchroides*		RB
25.	White eyed Buzzard	*Butastur teesa*	O	V
26.	Desert Buzzard /Common Buzzard	*Buteo buteo*	O	WV
27.	Long legged Buzzard	*Buteo rufinus*	O	WV
28.	Lesser Spotted Eagle	*Aquila pomarina*	R	PM
29.	Greater Spotted Eagle	*Aquila clanga*	R	PM
30.	Tawny Eagle	*Aquila rapax vindhiana*	O	V (AQRA)

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No	Common Name	Scientific name	Status	Distribution
31.	Bonelli's Eagle	*Hieraaetus fasciatus*	O	V
32.	Booted Eagle	*Hieraaetus pennatus*	S	WV
	Order Falconiformes			
	Family Falconidae			
33.	Red headed Merlin/Turumtee	*Falco chicquera*	S	V
34.	Laggar Falcon	*Falco jugger*	R	V
35.	Northern Hobby	*Falco subbuteo*	O	PM
36.	Saker Falcon	*Falco cherrug*	O	WV
37.	Peregrine Falcon	*Falco peregrinus*	O	V
38.	Red capped Falcon/Barbary Falcon	*Falco pelegrinoides*		RB
	Order Galliformes			
	Sub Family Phasianaidae			
39.	Chukar/Rock Partridge	*Alectoris chukar*	C	RB
40.	Black Partridge/Black Francolin	*Francolinus francolinus*	C	RB
41.	Indian Grey Partridge/Grey Francolin	*Francolinus pondicerianus*	F	Re
42.	Kalij/Kaleej Pheasant/White crested Kaleej	*Lophura leucomelana*	A	RB
	Order Columbiformes			
	Family Columbidae			
43.	Rock Dove, Blue Rock Pigeon	*Columba livia*	O	V
44.	Wood Pigeon, Eastern Ring Dove/Cushat	*Columba palumbus*	A	RB
45.	Indian Ring Dove, Collared Dove/Collared Turtle Dove	*Streptopelia decaocto*		SB
46.	Red Turtle Dove/Red Collared Dove	*Streptopelia tranquebarica*	F	PM
47.	Eastern Rufous Turtle Dove/Oriental Turtle Dove	*Streptopelia orientalis*	O	SB
48.	Little Brown Dove, Laughing/Palm Dove of Africa	*Streptopelia senegalensis*	C	RB
49.	Spotted Dove/Chinese Dove	*Streptopelia chinensis*	A	SB/WV
	Order Psittaciformes			
	Family Psittacidae			
50.	Alexandrine/Large Indian Parakeet	*Psittacula eupatria*		RB
51.	Rose ringed Parakeet	*Psittacula krameri*	A	RB
52.	Plum headed/Blossom headed Parakeet	*Psittacula cyanocephala*	F	V/SB
53.	Slaty headed Parakeet	*Psittacula himalayana*	F	WV
	Order Cuculiformes			
	Family Cuculidae			
54.	Pied Crested Cuckoo/Jacobin Cuckoo	*Clamator jacobinus*	C	SV
55.	Brainfever Bird (Common Hawk Cuckoo)	*Hierococcyx varius*	A	SB/WV
56.	Plaintive Cuckoo/Grey bellied Plaintive Cuckoo	*Cacomantis passerinus*	F	SV
57.	Indian Cuckoo/Short winged Cuckoo	*Cuculus micropterus*	R/S	SV
58.	Eurasian Cuckoo	*Cuculus canorus*	C	PM

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No	Common Name	Scientific name	Status	Distribution
59.	Himalayan/Oriental Cuckoo	*Cuculus saturatus*	R	PM
60.	Little Cuckoo/Lesser Cuckoo/Small Cuckoo	*Cuculus poliocephalus*	R	V
61.	Koel	*Eudynamys scolopacea*	A	SB/WV
62.	Sirkeer Malkoha/Cuckoo	*Taccocua leschenaultii*		RB
63.	Greater Coucal/Common Crow pheasant	*Centropus sinensis*	C	RB
	Order Strigiformes			
	Family Strigidae			
64.	Oriental Scops Owl/Asian Scops Owl	*Otus sunia*	R	PM
65.	Pallid Scops/Striated Scops Owl	*Otus brucei*	rb	
66.	Northern Eagle Owl/Rock Eagle Owl/Indian Great Horned Owl	*Bubo bubo*	R	WV
67.	Collared Pigmy Owlet	*Glaucidium brodiei*	S	WV
68.	Asian/Himalayan Barred Owlet	*Glaucidium cuculoides*		RB
69.	Spotted Owlet/Spotted Little Owl	*Athene brama*	C	RB
	Order Caprimulgiformes			
	Family Carprimulgidae			
70.	Savanna/Allied/Franklin's Nightjar	*Caprimulgus affinis*	F	SB/Re
71.	Sykes's/Sind Nightjar	*Caprimulgus mahrattensis*	Va	
72.	Large tailed/Long tailed Nightjar	*Caprimulgus macrurus*	C	SB
73.	Jungle, Grey/Japanese Nightjar	*Caprimulgus indicus*	Va	
74.	European Nightjar/Unwin Nightjar	*Caprimulgus europaeus*	O	V
	Order Apodiformes			
	Family Apodidae			
75.	White throated Needle tail/White throated Spinetail Swift	*Hirundapus caudacutus*		
76.	Common Swift	*Apus apus*	S	SV
77.	Pacific Swift, Asian White rumped Swift/Fork tailed Swift	*Apus pacificus*	S	SV
78.	Alpine Swift	*Apus melba*	C	PM
79.	Little Swift, House Swift/Indian House Swift	*Apus affinis*	C,	wv
	Order Coraciiformes			
	Family Alcedinidae			
80.	White throated Kingfisher, White breasted Kingfisher/Smyrna Kingfisher	*Halcyon smyrnensis*	C	RB
81.	Common Eurasian Kingfisher/Small Blue Kingfisher *Alcedo atthis*		F,	RB
82.	Pied Kingfisher/Small Pied Kingfisher	*Ceryle rudis*	C	RB
83.	Crested Kingfisher *Ceryle lugubris* Large Pied/Himalayan Pied Kingfisher	*Megaceryle lugubris*	O	WV
	Family Meropidae			
84.	Little Green Bee eater	*Merops orientalis*	A	SB
85.	Blue cheeked Bee eater	*Merops superciliosus*	S	SV
86.	Blue tailed Bee eater	*Merops philippinus*	F	SB
87.	European Bee eater	*Merops apiaster*	S	Re/PM

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No	Common Name	Scientific name	Status	Distribution
	Family Coraciidae			
88.	Eurasian Roller (Kashmir Roller)	*Coracias garrulus*		PM
89.	Indian Roller/Blue Jay	*Coracias benghalensis*	C	SB/V
	Family Upupidae			
90.	Hoopoe	*Upupa epops*	C	RB
	Order Piciformes			
	Family Capitonidae			
91.	Great Barbet/Great Hill Barbet	*Megalaima virens*	S	RB
92.	Blue throated Barbet	*Megalaima asiatica*	F	RB
93.	Coppersmith/Crimson breasted Barbet	*Megalaima haemacephala*	C	RB
	Family Picidae			
94.	Eurasian Wryneck	*Jynx torquilla*		WV/RB
95.	Speckled Piculet/Spotted Piculet	*Picumnus innominatus*	S	RB
96.	Scaly bellied Green Woodpecker	*Picus squamatus*	C	RB
97.	Lesser Golden backed Woodpecker/Golden backed Woodpecker	*Dinopium benghalense*	F	RB
98.	Sind Pied Woodpecker	*Dendrocopos assimilis*	O	Ir
99.	Himalayan Pied Woodpecker	*Dendrocopos himalayensis*		
100.	Rufous bellied Pied Woodpecker/Rufous bellied Sapsucker	*Dendrocopos hyperythrus*	O	Ir
101.	Yellow fronted Woodpecker	*Dendrocopos mahrattensis*	F	V/RB
102.	Brown fronted Woodpecker	*Dendrocopos auriceps*	F	WV/SV
103.	Fulvous breasted Woodpecker Dendrocopos macei/Fulvous breasted Pied Woodpecker	*Picoides macei*	F	WV/SpV
104.	Grey capped Pygmy Woodpecker Dendrocopos canicapillus/Grey headed Pied Woodpecker	*Picoides canicapillus*	R	V
	Order Passeriformes			
	Family Pittidae			
105.	Indian Pitta, Blue winged/Fairy Pitta	*Pitta brachyuran*	S	SB
	Family Alaudidae			
106.	Red winged/Indian Bush Lark	*Mirafra erythroptera*	S	V
107.	Greater Short toed Lark	*Calandrella brachydactyla*	S	PM
108.	Indian Sand Lark	*Calandrella raytal*	Va	
109.	Crested Lark	G*alerida cristata*	C	RB
110.	Small Skylark, Lesser Skylark, Eastern/Small Indian Skylark	*Alauda gulgula*	C	RB
111.	Common/Eurasian Skylark	*Alauda arvensis*	F	WV
112.	Horned Lark	*Eremophila alpestris*	Va	
	Family Hirundinidae			
113.	Inidan Sand Martin/ African throated Sand Martin	*Riparia paludicola*	A	SV/V
114.	Collared Sand Martin Pale Sand Martin	*Riparia riparia diluta* *Riparia diluta*	S/F	V/WV
115.	Pale Crag Martin/African Rock Martin	*Ptyonoprogne fuligula*		

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No	Common Name	Scientific name	Status	Distribution
116.	Crag Martin	*Ptyonoprogne rupestris*	F	WV/PM
117.	Common Swallow, Barn Swallow	*Hirundo rustica*	A	
118.	Wire tailed Swallow	*Hirundo smithii*	C	SB/WV
119.	Red rumped Swallow	*Hirundo daurica*	C	PM/V
120.	Indian Cliff Swallow	*Hirundo fluvicola*	O	V
121.	Kashmir House Martin/Asian House Martin	*Delichon dasypus*	O	PM
	Family Motacillidae			
122.	Richard's Pipit/Paddyfield Pipit	*Anthus novaeseelandiae/ rufulus*	C	RB
123.	Upland Pipit	*Anthus sylvanus*	S	RB
124.	Tawny Pipit	*Anthus campestris*	F	WV
125.	Persian Rock Pipit, Long billed Pipit, Brown Rock Pipit	*Anthus similis*	F	WV/SB
126.	Olive backed Pipit	*Anthus hodgsoni*	Va	
127.	Tree Pipit/Brown Tree Pipit/Witherby's Tree Pipit	*Anthus trivialis*	F	PM/WV
128.	Red throated Pipit	*Anthus cervinus*	S	WV
129.	Hodgson's Pipit/Rosy Pipit/Vinaceous breasted Pipit/Rose breasted Pipit	*Anthus roseatus*	F	WV
130.	Water Pipit	*Anthus spinoletta*	F	Ir
131.	Buff bellied Pipit	*Anthus japonica*		
132.	Grey Wagtail	*Motacilla cinerea*	C	WV
133.	White Wagtail (including Pied Wagtail)	*Motacilla alba*	C	WV/SV
134.	Large Pied Wagtail/White Browed Wagtail	*Motacilla maderaspatensis*		RB
	Family Campehagidae			
135.	Common Wood Shrike/Lesser Wood Shrike	*Tephrodornis pondicerianus*	F	V
136.	Large Cuckoo Shrike	*Coracina novaehollandiae*		
137.	Long tailed Minivet	*Pericrocotus ethologus*	C	WV/SB
138.	Small/Wandering Minivet	*Pericrocotus cinnamomeus*	O	WV/SV
	Family Pycnonotidae			
139.	White cheeked Bulbul	*Pycnonotus leucogenys*	A	RB
140.	Red vented Bulbul	*Pycnonotus cafer*	A	RB
141.	Black Bulbul/Grey Bulbul	*Hypsipetes madagascariensis*	F	WV
	Family Prunellidae			
142.	Rufous breasted Accentor Prunella strophiata/Jerdon's Accentor	*Tharrhaleus jerdoni*	WV	
143.	Black throated Accentor	*Prunella atrogularis*	F	WV
	Family Turdidae			
144.	Blue Throat	*Luscinia svecica*	S/F	PM/WV
145.	Black breasted/White tailed/ Himalayan Ruby throat	*Luscinia pectoralis*	S	WV
146.	Indian Blue Robin/Indian Blue Chat	*Luscinia brunnea*	Va	

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No	Common Name	Scientific name	Status	Distribution
147.	Orange flanked Bush robin/Red flanked Blue tail	*Tarsiger cyanurus*	O	WV
148.	Golden Bush Robin	*Tarsiger chrysaeus*	R	WV
149.	Indian Magpie Robin/'Dhyal'	*Copsychus saularis*	A	RB
150.	Eversmann's Redstart	*Phoenicurus erythronotus*	O	WV
151.	Blue headed Redstart/Blue headed Robin	*Phoenicurus caeruleocephalus*	F	WV
152.	Black Redstart	*Phoenicurus ochruros*	F	WV
153.	Plumbeous Redstart Rhyacornis fuliginosus/ Slaty blue Redstart	*Ruticilla fuliginosa*	F	WV/V
154.	Brown Rock Chat	*Cercomela fusca*	Va	
155.	Stonechat Saxicola torquata/Collared Indian Bush Chat	*Pratincola maura*	C	PM/WV
156.	White tailed Bush chat	*Saxicola leucura*	O	WV
157.	Pied Stonechat/Pied Bush Chat	*Saxicola caprata*	C	RB
158.	Dark grey Bush Chat/Grey Bush Chat	*Saxicola ferrea*	C	WV
159.	Isabelline Wheatear	*Oenanthe isabellina*	S	V
160.	Red tailed Wheatear	*Oenanthe xanthoprymna*	Va	
161.	Eastern Pied Wheatear/Variable Wheatear	*Oenanthe picata*	F	WV
162.	White capped Redstart, Water Redstart	*Chaimarrornis leucocephalus*	C	WV
163.	Indian Robin	*Saxicoloides fulicata*	C	RB
164.	Rufous tailed Rock Thrush/Rock Thrush	*Monticola saxatilis*	Va	
165.	Blue capped/Blue headed Rock Thrush	*Monticola cinclorhyncha*	S	PM
166.	Chestnut bellied Rock Thrush	*Monticola rufiventris*	S	WV
167.	Blue Rock Thrush	*Monticola solitarius*	F	PM/WV
168.	Blue Whistling Thrush/Himalayan Whistling Thrush	*Myiophoneus caeruleus*	C	WV
169.	Ground Thrush/Orange headed Ground Thrush	*Zoothera citrina*	S	RB/WV
170.	Scaly Thrush/White's/Golden Mountain Thrush	*Zoothera dauma*	R	WV
171.	Grey winged Blackbird	*Turdus boulboul*	O	WV
172.	Chestnut Thrush/Grey headed Thrush	*Turdus rubrocanus*	O	WV
173.	Naumann's Thrush/Dusky Thrush	*Turdus naumananni*	Va	
174.	Dark throated Thrush/Red & Black throated Thrushes/Black throated Thrush	*Turdus ruficollis atrogularis*	C	WV
	Sub Family Enicurinae			
175.	Little Forktail	*Enicurus scouleri*	Va	
176.	Spotted Forktail	*Enicurus maculatus*	S	WV
	Family Sylviidae			
	Sub Family Sylviinae			
177.	Pale Strong footed Bush Warbler/ Brownish flanked Bush Warbler	*Cettia fortipes*	F	WV

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No	Common Name	Scientific name	Status	Distribution
178.	Cetti's Warbler	*Cettia cetti*	S	SPM
179.	Fan tailed Warbler/Streaked Fantail Warbler/Zitting Cisticola	*Cisticola juncidis*	C	SB/V
180.	Streaked Longtail Warbler	*Prinia gracilis*	O	WV
181.	Ashy grey Wren Warbler/Ashy Wren Warbler, Franklin's Wren Warbler, Grey breasted	*Prinia Prinia hodgsonii/ Franklinia gracilis*	C	RB
182.	Rufous fronted Prinia	*Prinia buchanani*	R	WV/SB
183.	Hodgson's Wren Warbler/Grey crowned Prinia/Grey capped Prinia	*Prinia cinereocapilla*	Va	
184.	Tawny/Plain Coloured Prinia	*Prinia inornata/Prinia subflava*	C	RB
185.	Ashy Longtail Warbler/Ashy Wren warbler	*Prinia socialis*	Va	
186.	Yellow bellied Wren warbler	*Prinia flaviventris*		RB
187.	Brown Hill Warbler/Brown Hill Prinia	*Prinia criniger*	C	RB
188.	Long tailed Prinia/Long tailed Grass Warbler	*Prinia burnesii*	Va	
189.	Streaked Scrub Warbler	*Scotocerca inquieta*	R	RB
190.	Tailor Bird/Indian Tailor Bird	*Orthotomus sutorius*	C	RB
191.	Grasshopper Warbler	*Locustella naevia*	Va	
192.	Bristled Grass Warbler	*Chaetornis striatus*	Va	
193.	Moustached Sedge Warbler	*Acrocephalus melanopogon*	C	SPM
194.	Blunt winged Paddy field Warbler	*Acrocephalus concinens*	R	PM
195.	Paddy field Warbler	*Acrocephalus agricola*	F	PM/v
196.	Blyth's Reed Warbler	*Acrocephalus dumetorum*	A	PM
197.	Clamorous/Southern Great Reed Warbler/Indian Great Reed Warbler	*Acrocephalus stentoreus*	S	PM/SB
198.	Great Reed Warbler/Eastern Great Reed Warbler	*Acrocephalus arundinaceus*	R	RB
199.	Booted Warbler *Hippolais caligata*, Sykes's Tree Warbler *Hippolais rama*, Booted Tree Warbler	*Hippolais scita*	F	PM/WV
200.	Desert Warbler	*Sylvia nana*	Va	/PM
201.	Orphean Warbler	*Sylvia hortensis*		PM
202.	Lesser Whitethroat	*Sylvia curruca*	F	PM
203.	Common Whitethroat	*Sylvia communis*	Va	
204.	Grey headed Flycatcher warbler	*Seicercus xanthoschistos*	A	RB
205.	Yellow eyed/Golden Spectacled Flycatcher Warbler/Black browed Flycatcher Warbler	*Seicercus burkii*	R	Re
206.	Western/Large Crowned Leaf Warbler/Western Crowned Leaf Warbler	*Phylloscopus occipitalis*	C	PM
207.	Tytler's/Slender billed Leaf Warbler	*Phylloscopus tytleri*	S	PM
208.	Green Warbler/Bright Green Leaf Warbler	*Phylloscopus nitidus*	Va	

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No	Common Name	Scientific name	Status	Distribution
209.	Greenish Warbler/Dull Green Leaf Warbler	*Phylloscopus trochiloides*	C	PM/WV
210.	Dusky Willow Warbler	*Phylloscopus fuscatus*	Va	
211.	Large billed Willow Warbler	*Phylloscopus magnirostris*	Va	
212.	Pallas's/Yellow rumped Leaf Warbler	*Phylloscopus proregulus*	C	WV
213.	Brooks's Leaf Warbler	*Phylloscopus subviridis*	O	WV
214.	Yellow browed/Inornate Leaf Warbler	*Phylloscopus inornatus/ Phylloscopus inornatus humei*	C	PM/WV
215.	Olivaceous Leaf Warbler/Sulphur bellied Warbler	*Phylloscopus griseolus*	C	PM
216.	Tickell's Leaf Warbler/Chinese Leaf Warbler	*Phylloscopus affinis*	Va	Re/PM
217.	Mountain Chiffchaff/Sind Chiffchaff	*Phylloscopus sindianus*	R	PM
218.	Eurasian Chiffchaff/Chiffchaff	*Phylloscopus collybita*	S	PM/WV
	Family Muscicapidae			
219.	Rufous bellied Niltava	*Niltava sundara*	O	WV
220.	Blue throated Flycatcher	*Cyornis rubeculoides*	S	SB
221.	Verditer Flycatcher	*Muscicapa thalassina*	O	PM/WV
222.	Sooty/Dark sided Flycatcher	*Muscicapa sibirica*		PM
223.	Spotted Flycatcher	*Muscicapa striata*	S	WV
224.	Slaty blue Flycatcher	*Ficedula tricolor*	O	WV
225.	Ultramarine Flycatcher	*Ficedula superciliaris*	S	SPM
226.	Red breasted Flycatcher/Red throated Flycatcher	*Ficedula parva*	O	PM/WV
227.	Grey headed (Canary) Flycatcher	*Culicicapa ceylonensis*	O	WV/SV
	Family rhipiduridae			
228.	White throated Fantail Flycatcher	*Rhipidura albicollis*	F	RB
229.	White browed Fantail	*Rhipidura aureola*	S	WV
	Family Monarchidae			
230.	Asian Paradise Flycatcher	*Terpsiphone paradisi*	C	SB
	Family Timaliidae			
231.	Rusty cheeked Scimitar babbler	*Pomatorhinus erythrogenys*	C	RB
232.	Black chinned Babbler	*Stachyris pyrrhops*	F	RB
233.	Common Babbler	*Turdoides caudatus*	A	RB
234.	Large Grey Babbler	*Turdoides malcolmi*		
235.	Jungle Babbler	*Turdoides striatus*	A	RB
236.	Variegated Laughing thrush	*Garrulax variegatus*	S	WV
237.	Streaked/Himalayan Laughing thrush	*Garrulax lineatus*	F	WV/SV
238.	Red billed Leiothrix/Peking Robin	*Leiothrix lutea*	A	WV
239.	Black capped Sibia	*Heterophasia capistrata*	Va	
	Family Aegithalidae			
240.	White cheeked Longtailed Tit	*Aegithalos leucogenys*		RB
	Family Paridae			
241.	Simla/Black Crested Tit	*Parus rufonuchalis*	O	WV
242.	Crested Black Tit	*Parus melanolophus*	S	WV

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No	Common Name	Scientific name	Status	Distribution
243.	Great Tit	*Parus major*	C	RB/WV
244.	Green backed Tit	*Parus monticolus*	F	WV
245.	Yellow cheeked Tit	*Parus xanthogenys*	R	
	Family Certhiidae			
246.	Himalayan/Bar tailed Tree Creeper	*Certhia himalayana*	C	WV
	Family Nectariniidae			
247.	Purple Sunbird	*Nectarinia asiatica*	C	PM
248.	Mrs. Gould's/Blue throated Sunbird	*Aethopyga gouldiae*	R	WV
	Family Zosteropidae			
249.	Oriental White eye	*Zosterops palpebrosa*	A	RB
	Family Oriolidae			
250.	Golden Oriole	*Oriolus oriolus*	C	SB/SV
	Family Laniidae			
251.	Rufous backed Shrike/Long tailed Shrike	*Lanius schach*	A	RB
252.	Great Grey Shrike	*Lanius excubitor*	C	PM
	Family Dicruridae			
253.	Black Drongo/King Crow	*Dicrurus macrocercus*	A	SB/SV
254.	Ashy/Grey Drongo	*Dicrurus leucophaeus*	O	SB
	Family Corvidae			
255.	Lanceolated /Black throated Jay	*Garrulus lanceolatus*	O	RB
256.	Yellow billed Blue Magpie	*Urocissa flavirostris*	R	WV
257.	Indian Tree Pie Dendrocitta vagabunda/Rufous Tree pie	*Dendrocitta rufa*	C	RB
258.	Himalayan/Grey Tree Pie	*Dendrocitta formosae*	O	RB
259.	Indian House Crow	*Corvus splendens*	A	RB
260.	Rook	*Corvus frugilegus*	O	WV
261.	Large Billed/Jungle Crow	*Corvus macrorhynchos*	O	WV
262.	Raven	*Corvus corax*	S	V
	Family Sturnidae			
263.	Chestnut tailed Starling/Grey headed Myna	*Sturnus malabaricus*	Va	
264.	Brahminy Starling/Black headed Myna	*Sturnus pagodarum*	C	RB
265.	Common Starling	*Sturnus vulgaris*	A	WV/SB
266.	Rose coloured/Rosy Starling Rosy Pastor	*Sturnus roseus*/ *Pastor roseus*	S	PM
267.	Asian Pied Starling/Pied Myna	*Sturnus contra*	F	WV
268.	Common/Indian Myna	*Acridotheres tristis*	A	RB
269.	Bank Myna	*Acridotheres ginginianus*	C	RB
270.	Jungle Myna	*Acridotheres fuscus*	O	V
	Family Passeridae			
271.	House Sparrow	*Passer domesticus*	A	RB
272.	Cinnamon Tree Sparrow/Russet Sparrow	*Passer rutilans/Passer rytukans*	O	WV
273.	Yellow throated/Chestnut shouldered Rock Sparrow	*Petronia xanthocollis*	S	V/SV

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No	Common Name	Scientific name	Status	Distribution
	Family Ploceidae			
274.	Indian Baya/Baya Weaver	*Ploceus philippinus*	C	RB
275.	Black throated/Black breasted Weaver	*Ploceus benghalensis*		SB
276.	Streaked Weaver	*Ploceus manyar*	S	V
	Family Estrildidae			
277.	Red Munia/Avadavat/Red Avadavat	*Estrilda amandaval Amandava Amandava*	F	V/RB
278.	White throated Munia/Indian Silverbill	*Eodice malabarica*	F	Ir/V
279.	Spotted Munia	*Lonchura punctulata*	F	V/RB
	Sub Family Fringillinae			
280.	Chaffinch	*Fringilla coelebs*	O	WV
	Sub Family Carduelinae			
281.	Himalayan Greenfinch	*Carduelis spinoides*	O	WV
282.	Eurasian Goldfinch	*Carduelis carduelis*	O	WV
283.	Linnet	*Carduelis cannabina*	S	WV
284.	Common Rosefinch/Scarlet Grosbeak	*Carpodacus erythrinus*	A	PM/WV
285.	Pink browed Rosefinch	*Carpodacus rhodochrous*	S	Re/WV
286.	White browed Rosefinch	*Carpodacus thura*	Va	
287.	Himalayan/Thin billed Red mantled Rosefinch	*Carpodacus grandis*	Va	Ir
288.	Himalayan Red mantled Rosefinch	*Carpodacus rhodochlamys grandis*	S	WV
289.	Bullfinch	*Pyrrhula species*	Va	
	Sub Family Emberizinae			
290.	Pine Bunting	*Emberiza leucocephalos*	Va	Ir/WV
291.	White capped Bunting	*Emberiza stewarti*	C	WV
292.	Rock Bunting	*Emberiza cia*	C	WV
293.	Grey necked Bunting	*Emberiza buchanani/ Emberiza huttoni*	S	WV
294.	Reed Bunting	*Emberiza schoeniclus*	O	WV
295.	Red headed Bunting	*Emberiza bruniceps*	Va	
296.	Crested Bunting	*Melophus lathami*	S	Re/SB

Exhibit.D.3: Birds of the MHNP

No.	Common Name	Scientific Name	Status
1.	Alexandrine or Large Indian Parakeet	*Psittacula eupatria*	R
2.	Alpine Swift	*Apus melba*	TM
3.	Ashy Drongo	*Dicrurus leucophaeus*	SB
4.	Ashy-grey Wren Warbler	*Prinia hodgsonii*	R
5.	Asian Paradise Flycatcher	*Terpsiphone paradisi*	SB
6.	Barn or Common Swallow	*Hirundo rustica*	R
7.	Bar-tailed or Himalayan Tree-creeper	*Certhia himalayana*	W
8.	Black Bulbul	*Hypsipetes madagascari*	W
9.	Black Crested Tit or Simla Tit	*Parus rufonuchalis*	W
10.	Black Drongo	*Dicrurus macrocercus*	R
11.	Black headed or Brahminy Myana	*Sturnus pagodarum*	R
12.	Black Partridge	*Francolinus francolinus*	R
13.	Black Redstart	*Phoenicurus ochruros*	W
14.	Black-breasted or White-tailed Rubythroat	*Luscinia pectoralis*	W
15.	Black-chinned Babbler	*Stachyris pyrrhops*	R
16.	Black-throated Accentor	*Prunella atrogularis*	W
17.	Blossom-headed Parakeet	*Psittacula cyanocephala*	R
18.	Blue Rock Thrush	*Monticola solitarius*	W
19.	Blue Whistling Thrush	*Myiophoneus caeruleus*	W
20.	Blue-cheeked Bee-eater	*Merops superciliosus*	W
21.	Blue-headed Redstart	*Phoenicurus caeruleocephalus*	W
22.	Blue-headed Rock Thrush	*Monticola cinclorhyncha*	TM
23.	Blue-throated Barbet	*Megalaima asiatica*	R
24.	Blue-throated Flycatcher	*Cyornis rubeculoides*	SB
25.	Blue-throated Sunbird	*Aethopyga gouldiae*	W
26.	Blyth's Reed Warbler	*Acrocephalus dumetorum*	TM
27.	Bonnelli's Eagle	*Hieraaetus fasciatus*	R
28.	Booted Eagle	*Hieraaetus pennatus*	R
29.	Booted Warbler	*Hippolais caligata*	TM
30.	Brook's Leaf Warbler	*Phylloscopus subviridis*	SB
31.	Brown Hill Warbler	*Prinia criniger*	R
32.	Cattle egret	*Bubulcus ibis*	R
33.	Chestnut-bellied Rock Thrush	*Monticola rufiventris*	TM
34.	Chukar Partridge or Chukor	*Alectoris chukar*	R
35.	Cinnamon Tree Sparrow	*Passer rutilans*	W
36.	Collared Pygmy Owlet	*Glaucidium brodiei*	R
37.	Common Babbler	*Turdoides caudatus*	R
38.	Common Hawk Cuckoo	*Hierococcyx varius*	SB
39.	Common Myna	*Acredotheres tristis*	R
40.	Common Starling	*Sturnus vulgaris*	R
41.	Common swift	*Apus apus*	SB
42.	Common Wood Shrike	*Tephrodornis pondicerianus*	W
43.	Common Wood Shrike	*Tephrodornis pondicerianus*	TM
44.	Coppersmith or Crimson-breasted Barbet	*Megalaima haemacephala*	R

Continues...

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...Continued

No.	Common Name	Scientific Name	Status
45.	Crag Martin	*Ptyonoprogne rupestris*	W
46.	Crag Martin	*Ptyonoprogne rupestris*	TM
47.	Crested Black Tit	*Parus melanolophus*	W
48.	Crested Bunting	*Melophusu lathami*	W
49.	Crested Lark	*Galerida cristata*	R
50.	Dark-throated Thrush or Black-throated Thrush	*Turdus ruficollis atrogularis*	W
51.	Desert Buzzard	*Buteo buteo*	W
52.	Desert Warbler	*Sylvia nana*	SB
53.	Eagle Owl	*Bubo bubo*	W
54.	Eastern Pied Wheatear	*Oenanthe picata*	W
55.	Eurasian Chiffchaff or Brown Chiffchaff	*Pylloscopus collybita*	TM
56.	Eurasian Cuckoo	*Cuculus canorus*	SB
57.	Eurasian Kestrel	*Falco tinnunculus*	R
58.	Eurasian skylark	*Alauda arvensis*	W
59.	Eurasian Sparrow Hawk	*Accipiter nisus*	W
60.	European Bee-eater	*Merops apiaster*	R
61.	European Bee-eater	*Merops apiaster*	W
62.	Fairy Pitta or Indian Pitta or Blue-winged Pitta	*Pitta brachyura*	R
63.	Fulvous-breasted Woodpecker	*Dendrocopos macei*	SB
64.	Golden Bush Robin	*Tarsiger chrysaeus*	W
65.	Golden Oriole	*Oriolus oriolus*	SB
66.	Golden-backed Woodpecker	*Dinopium benghalensis*	R
67.	Goshawk	*Accipiter gentilis*	TM
68.	Great Hill Barbet	*Megalaima virens*	R
69.	Greater Coucal or Common Crow-pheasant	*Centropus sinensis*	R
70.	Greater Short-toed Lark	*Calandrella brachydactyla*	TM
71.	Greater Spotted Eagle	*Aquila clanga*	W
72.	Green Warbler	*Phylloscopus nitidus*	TM
73.	Green-backed Tit	Parus monticolus	W
74.	Greenish Warbler or Dull Green Leaf Warbler	*Phylloscopus torchiloides*	TM
75.	Grey Partridge	*Francolinus pondicerianus*	R
76.	Grey Wagtail	*Motacilla cinerea*	W
77.	Grey-capped Pygmy Woodpecker	*Dendrocopos canicapillus*	TM
78.	Grey-headed Flycatcher	*Culicicapa ceylonensis*	W
79.	Grey-headed Flycatcher Warbler	*Seicercus xanthoschistos*	R
80.	Grey-winged Blackbird	*Turdus boulboul*	W
81.	Himalayan Jungle Crow	*Corvus macrorhynchos*	W
82.	Himalayan or Oriental Cuckoo	*Cuculus staturatus*	SB
83.	Himalayan Tree Pie or Grey Tree Pie	*Dendrocitta formosae*	R
84.	Hoopoe	*upupa epops*	R
85.	House Crow	*Corvus splendens*	R
86.	House Sparrow	*Passer domesticus*	R
87.	Indian Kite or Pariah Kite	*Milvus migrans*	R

Continues...

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...Continued

No.	Common Name	Scientific Name	Status
88.	Indian Magpie Robin	*Copsychus saularis*	R
89.	Indian or Short-winged Cuckoo	*Cuculus micropterus*	SB
90.	Indian Pond Heron or Paddy bird	*Ardeola grayii*	R
91.	Indian Ring Dove	*Streptopelia decaocto*	R
92.	Indian Robin	*Saxicoloides fulicata*	R
93.	Indian Sand Martin	*Riparia paludicola*	SB
94.	Indian Tree Pie	*Dendrocitta vagabunda*	R
95.	Isabelline Wheatear	*Oenanthe isabellina*	TM
96.	Jungle Babbler	*Turdoides striatus*	R
97.	Jungle Myna	*Acridotheres fuscus*	R
98.	Kaleej Pheasant or White-crested Kaleej	*Lophura leucomelana*	R
99.	Kashmir House Martin	*Delichon dasypus*	TM
100.	Koel	*Euedynamys scolopaceus*	SB
101.	Lanceolated Jay	*Garrulus lanceolatus*	SB
102.	Large Crowned Leaf Warbler	*Phylloscopus occipitalis*	TM
103.	Large Pied Wagtail	*Monticilla maderaspatensis*	R
104.	Large-billed Leaf Warbler	*Phylloscopus magnirostris*	TM
105.	Lesser Whitethroat	*Sylvia curruca*	R
106.	Little Brown Dove	*Streptopelia senegalensis*	R
107.	Little Cuckoo	*Cuculus poliocephalus*	TM
108.	Little Egret	*Egretta garzetta*	R
109.	Little Green Bee-eater	*Merops orientalis*	R
110.	Little Swift or House Swift	*Apus affinis*	R
111.	Long-billed Pipit	*Anthus similis*	W
112.	Long-legged Buzzard	*Buteo rufinis*	W
113.	Long-tailed Minivet	*Pericrocotus ethologus*	W
114.	Long-tailed Nightjar	*Caprimulgus macrurus*	SB
115.	Northern Hobby	*Falco subbuteo*	W
116.	Orange Bullfinch	*Pyrrhula aurantiaca*	W
117.	Orange flanked Bush Robin	*Tarsiger cyanurus*	W
118.	Orange headed Ground Thrush	*Zoothera citrina*	W
119.	Oriental Scops Owl	*Otus sunia*	SB
120.	Oriental Turtle Dove	*Streptopelia orientalis*	W
121.	Oriental White-eye	*Zosterops palpebrosa*	R
122.	Pacific Swift or Asian White-rumped Swift	*Apus pacificus*	SB
123.	Paddy-field Warbler	*Acrocephalus agricola*	TM
124.	Pale Strong-footed Bush-Warbler	*Cettia fortipes*	W
125.	Pallid or striated Scops Owl	*Otus brucei*	SB
126.	Peking Robin	*Leiothrix lutea*	SB
127.	Peregrine or Shaheen Falcon	*Falco peregrinus*	W
128.	Pied Bush-Chat	*Saxicola caprata*	R
129.	Pied Bush-Chat	*Saxicola caprata*	W
130.	Pied Crested Cuckoo	*Clamator jacobinus*	SB
131.	Pied Kingfisher	*Ceryle rudis*	R
132.	Pied Wagtail	*Motacilla alba*	W
133.	Pine Bunting	*Emberiza leucocephalos*	W

Continues...

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...Continued

No.	Common Name	Scientific Name	Status
134.	Plaintive Cuckoo	*Cacomantis passerinus*	SB
135.	Plumbeous Redstart	*Rhyacornis fuliginosus*	W
136.	Purple Sunbird	*Nectarinia asiatica*	SB
137.	Red Munia or Avadavat	*Estrilda amandava*	R
138.	Red Turtle Dove	*Streptopelia tranquebarica*	SB
139.	Red-breasted Flycatcher	*Ficedula parva*	TM
140.	Red-capped Falcon	*Falco pelegrinoides*	W
141.	Red-headed Merlin or Turumtee	*Falco chiquera*	R
142.	Red-mantled Rosefinch	*Caprodacus grandis*	W
143.	Red-rumped Swallow	*Hirundo daurica*	TM
144.	Red-tailed Wheatear	*Oenanthe xanthoprymna*	W
145.	Red-vented Bulbul	*Pycnonotus cafer*	R
146.	Red-winged Bush Lark	*Mirafra erythroptera*	SB
147.	Richard's Pipit	*Anthus novaeseelandiae*	R
148.	Rock Bunting	*Emberiza cia*	W
149.	Rose-ringed Parakeet	*Psittacula krameri*	R
150.	Rosy Pipit	*Anthus roseatus*	W
151.	Rufous-backed Redstart	*Phoenicurus erythronotus*	W
152.	Rufous-backed Shrike	*Lanius schach*	R
153.	Rufous-bellied Niltava	*Niltava sundara*	W
154.	Rufous-breasted Accentor	*Prunella strophiata*	W
155.	Rufous-fronted Wren Warbler	*Prinia buchanani*	R
156.	Rufous-tailed Rock-thrush	*Monticola saxatilis*	TM
157.	Rusty-cheeked Scimitar-babbler	*Pomatorhina erythrogenys*	R
158.	Saker Falcon	*Falco cherrug*	R
159.	Savanna or Allied Nightjar	*Caprimulgus affinis*	SB
160.	Scaly-bellied Green Woodpecker	*Picus squamatus*	R
161.	Shikra or Indian Sparrow Hawk	*Accipiter badius*	R
162.	Short-toed Eagle	*Circaetus gallicus*	R
163.	Silverbill or White-throated Munia	*Lonchura malabarica*	R
164.	Sindh Chiffchaff	*Phylloscopus sindianus*	TM
165.	Sindh Pied Woodpecker	*Dendrocopos assimilis*	R
166.	Slaty Headed Parakeet	*Psittacula himalayana*	W
167.	Slaty-blue Flycatcher	*Ficedula tricolor*	W
168.	Small Minivet	*Pericrocotus cinnamomeus*	W
169.	Small Skylark	*Alauda gulgula*	R
170.	Sooty or dark-sided Flycatcher	*Muscicapa sibirica*	TM
171.	Spotted Dove or Chinese Dove	*Streptopelia chinensis*	R
172.	Spotted Flycatcher	*Muscicapa striata*	W
173.	Spotted Forktail	*Enicurus maculatus*	W
174.	Spotted Munia	*Lonchura punctulata*	R
175.	Spotted Munia	*Lonchura punctulata*	W
176.	Spotted Owlet	*Athene brama*	R
177.	Steppe Eagle	*Aquila rapex nipalensis*	W
178.	Stonechat or Collard Indian Bush-Chat	*Saxicola torquata*	TM
179.	Streaked long-tail Warbler	*Prinia gracilis*	R

Continues...

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...Continued

No.	Common Name	Scientific Name	Status
180.	Streaked or Himalayan Laughing-thrush	*Garrulax lineatus*	R
181.	Tailor Bird	*Orthotomus sutorius*	R
182.	Tawny Eagle	*Aquila rapax vindhiana*	W
183.	Tawny or Plain-colored Prinia	*Prinia inornata*	R
184.	Tawny Pipit	*Anthus campestris*	W
185.	Thick-billed Flowerpecker	*Dicaeum agile*	TM
186.	Tree Pipit	*Anthus trivialis*	TM
187.	Tytler's or Slender billed Leaf Warbler	*Phylloscopus tytleri*	TM
188.	Ultramarine Flycatcher	*Ficedula superciliaris*	W
189.	Ultramarine Flycatcher	*Ficedula superciliaris*	TM
190.	Upland Pipit	*Anthus sylvanus*	R
191.	Variegated Laughing-thrush	*Garrulax variegatus*	R
192.	Verditer Flycatcher	*Muscicapa thalassina*	W
193.	Water Pipit	*Anthus spinoletta*	W
194.	Wedge-tailed or Kokla Green Pigeon	*Treron sphenura*	W
195.	Western Sirkeer Cuckoo	*Taccocua leschenaultii*	R
196.	White-breasted Kingfisher	*Halcyon smyrnensis*	R
197.	White-browed Fantail Flycatcher	*Rhipidura aureola*	R
198.	White-capped Bunting	*Emberiza stewarti*	W
199.	White-cheeked Bulbul	*Pycnonotus leucogenys*	R
200.	White-cheeked long-tailed Tit	*Aegithalos leucogenys*	R
201.	White-eyed Buzzard	*Butastur teesa*	R
202.	White-throated Fantail Flycatcher	*Rhipidura albicollis*	SB
203.	White-winged Redstart	*Phoenicurus erythrogaster*	W
204.	Wire-tailed Swallow	*Hirundo smithii*	SB
205.	Wood Pigeon or Cushat	*Columba palumbus*	R
206.	Wood Pigeon or Cushat	*Columba hodgsonii*	TM
207.	Wryneck	*Jynx torquilla*	W
208.	Yellow Wagtail	*Motacilla flava*	W
209.	Yellow-bellied Fantail Flycatcher	*Rhipidura hypoxantha*	SB
210.	Yellow-billed Blue Magpie	*Urocissa flavirostris*	W
211.	Yellow-browed or Hume's Leaf Warbler	*Phyllosopus inornatus*	SB
212.	Yellow-browed or Hume's Leaf Warbler	*Phyllosopus inornatus*	TM
213.	Yellow-cheeked Tit	*Parus xanthogenys*	W
214.	Yellow-eyed or Golden Spectacled Flycatcher Warbler	*Seicercus burkii*	W
215.	Yellow-fronted Woodpecker	*Dendrocopos mahrattensis*	SB
216.	Yellow-headed Wagtail	*Motacilla citreola*	W
217.	Yellow-rumped Leaf Warbler	*Phylloscopus proregulus*	SB
218.	Yellow-throated Sparrow	*Petronia xanthocollis*	R

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