

SONGBIRDS
ECO-SYSTEM STUDY



oikos
for ecological services

A vibrant green leaf with small white spots resting on a dark, textured rock. The leaf is positioned on the left side of the image, and the rock is in the center. The background is a dark, textured surface, possibly gravel or sand.

COME FORTH INTO THE LIGHT OF THINGS,
LET NATURE BE YOUR TEACHER.
WILLIAM WORDSWORTH



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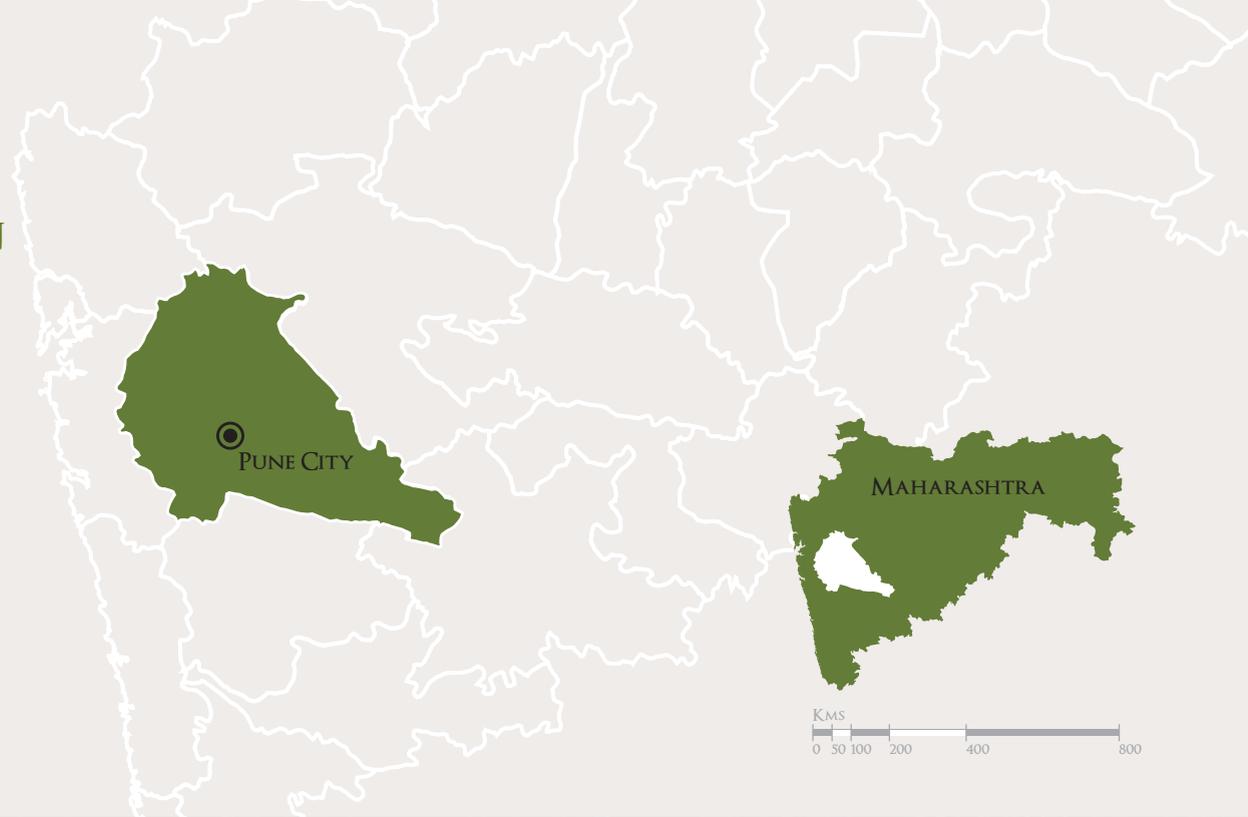
ABOUT OIKOS

Oikos is an ecological consultancy offering services for restoration of nature and biodiversity conservation. We believe that conservation of nature should be integral part of our life for better tomorrow.

There has been a complete shift from nature friendly, local land development techniques to large scaled, mechanized 'Land development'. This development is achieved by destruction of original terrain & biodiversity.

However, with Skyi Songbirds we have worked towards creating a township with all the amenities without disturbing its natural surroundings.

LOCATION



CURRENT STATUS OF LAND INTRODUCTION OF THE LOCATION

Bhugaon

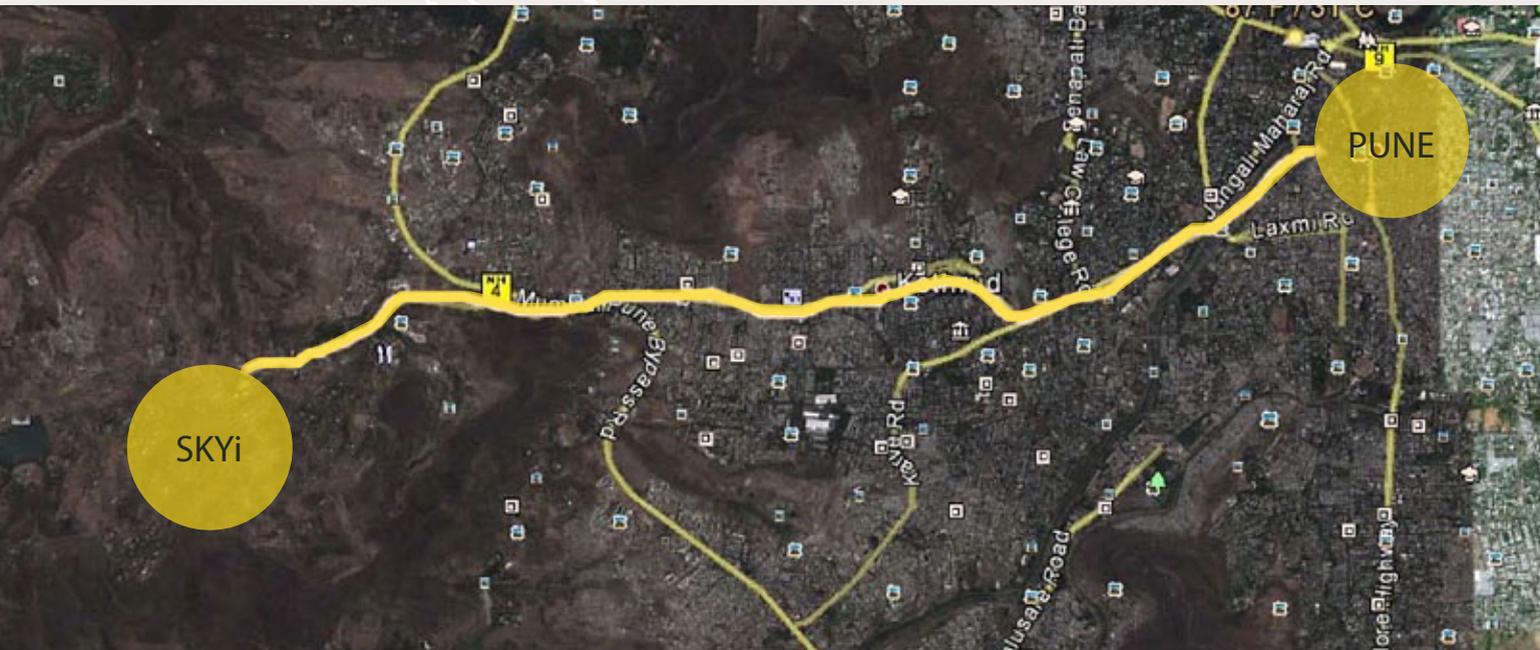
Bhugaon is located on the western side of the Pune city. Geographically, it lies at the base of the Western Ghats. Thus the average annual rainfall will be around 150 cm. The temperature in summers ranges between 35°C to 40°C. While the winter temperatures are in the range of 10°C to 20°C.

Songbirds

The project area, Songbirds, is in Bhugaon. The total area of the project land is 42 acres. The area is located 18°29' N and 73°45' E with an elevation of 2115 ft from the sea level. Currently, the land is open with agriculture terraces on the riverside with scattered trees & scrubby vegetation. Old growth trees were observed on farm bunds. Different types of scrubby vegetation like acacias with scattered Neem and Pangara trees dominate the landscape vegetation. The only water-way found on the land is the Ram Nadi.

Topography

The land has low to moderate slope. Most of the land is plain due to existing agricultural terraces. The project area has land with plain and moderate slopes. The land has a seasonal stream flowing along its periphery.



SITE LOCATION



CURRENT STATUS OF LAND INTRODUCTION OF THE LOCATION

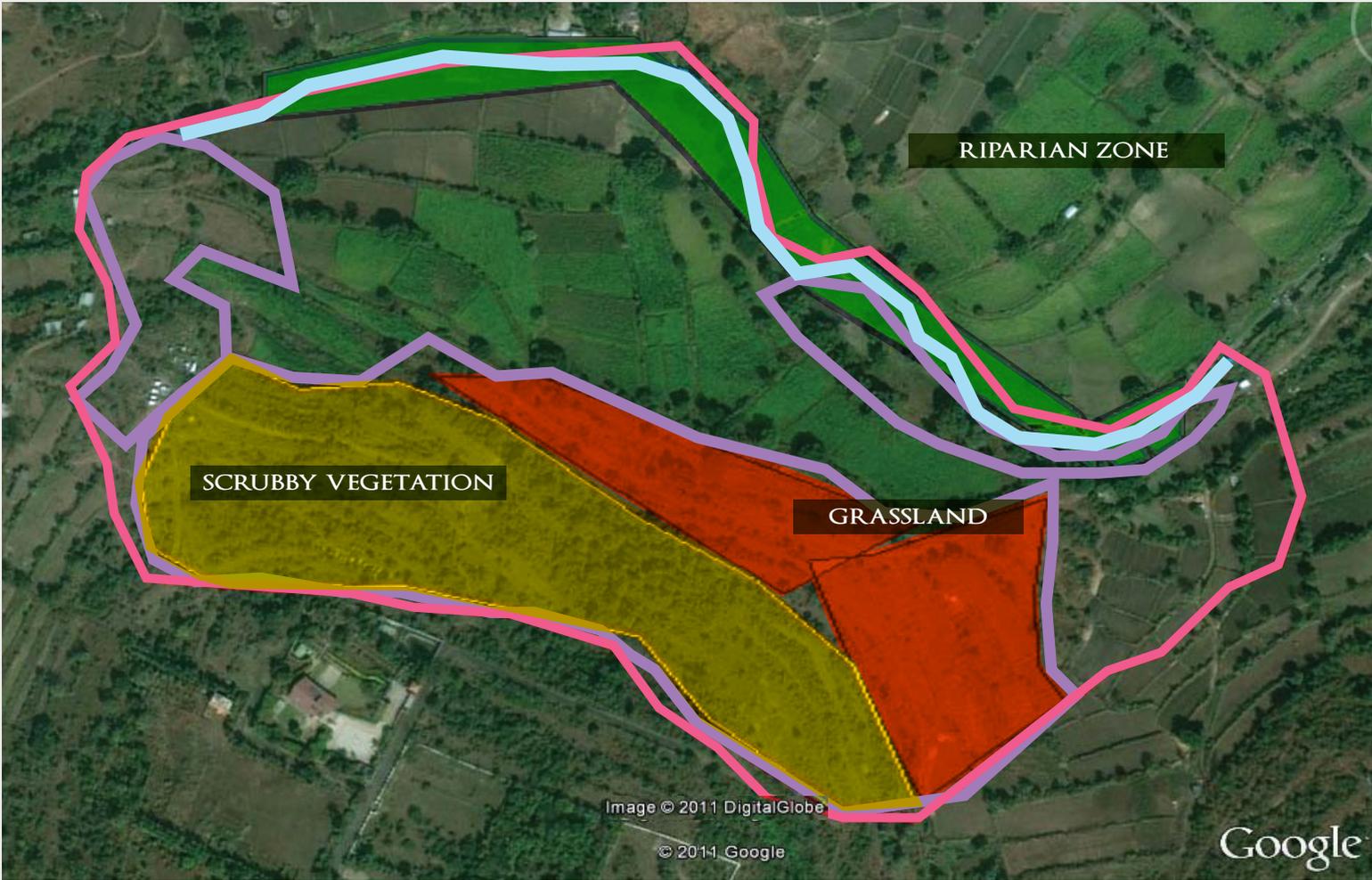
Vegetation

The land can be divided into 3 regions according to the type of vegetation observed. The upper contour of the land shows dry deciduous type of trees including prominent presence of Neem, Pangara, Babhul, Bor. The second patch of the middle contour shows presence of dominant herbs and grasses as there is no canopy cover and the land is directly exposed to the sunlight. The third patch of lower contour shows moist deciduous type of vegetation along the riparian zone (along the stream) including trees like Mango, Jamun, Bhokar, Aain, Pimpal, Umbar.

Fauna

As the land shows mixture of grasses, moderate canopy cover and presence of the stream, birds like sunbirds, pond herons, White eyes, Flycatchers, wagtails, warblers etc are observed. Due to absence of good vegetation cover, animals diversity found is low.

ZONING

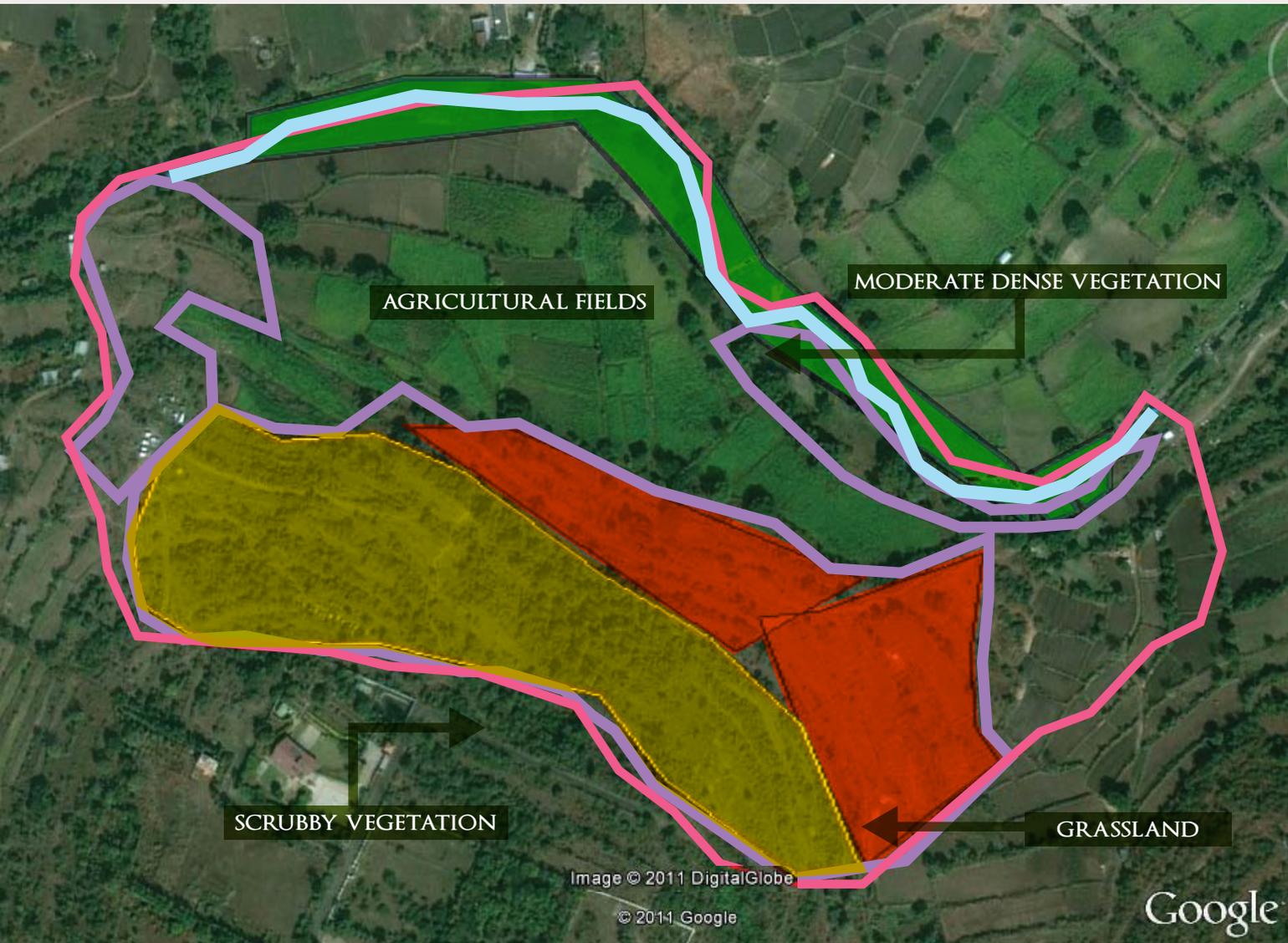




ANALYSIS OF BIO DIVERSITY

Songbirds is spread over an area of more than 40 acres. The land consists of a river 'Ram' along its periphery. The land can be categorized into 4 regions, namely; riparian zone, scrubby vegetation, agricultural fields and grassland. Having understood the basic properties of the land and the biodiversity, we attempt to establish principles for the landscaping of the area.

The riparian zone consists mainly of old grown trees like mango, tamarind, etc along the river bank. The total length of the riparian zone will be approximately 750 m. Thus, due to availability of water (of the river) as well as better canopy proving good shelters for the birds, the diversity of birds observed in this patch was maximum as compared to other regions on this land. The diversity of birds observed also indicates availability of their food i.e. insects, nectar, sag etc in the area.



ANALYSIS OF BIO DIVERSITY

The **scrubby region** is mainly observed on the middle and lower contour of the hillock present on the left side of the area. The type of vegetation observed in this area is mainly deciduous, like, Neem, Babhul, Pangara etc. Nests of few birds & bee hives were observed in this zone.

The **agricultural land** mainly consisted of crops like Rice and Jawar. The edges of these agricultural fields consist of old grown trees which are helping in providing shade to the land, reducing the temperatures during the summers. The roots of the old trees also provide shelter to various insects and reptiles. E.g. various types of lizards were found underneath the roots of the Tamarind tree.

The **grassland region**, comprising a small region in the total area, plays an important role with respect to ecology, as the diversity of insects and butterflies found is more in this region. Flora & fauna are dependent on each other.



ASSOCIATIONS

OBSERVATIONS AT SONGBIRDS PROJECT

Mango-bangul

The bird activity is observed maximum on the mango tree, on which we see presence of bangul (parasite). The nectar from these flowers attracts lot of birds during flowering season. Following birds were observed on trees, hunting for nectar & insects.

Oriental white eye – In number of 8 -10

Warblers – in number of 5-6

Purple rumped sunbird – in number of 4-5

Purple sunbird – in number of 4-5

Red throated flycatcher. – seen in pair, not regularly but occasionally.

Shindi

There is seasonal variation in bird activity. We could observe good number of birds in 2nd week of November on Shindi. These included birds like, Oriental white eye, White browed fantail flycatcher, Purple rumped sunbird, Purple sunbird, Verditer flycatcher (a migratory bird was first sited on this tree. This bird had used the tree probably as passing corridor before going to Western ghats), Thick billed flowerpecker, Common iora, Red vented bulbul. But during the last week of November, a noticeable observation was made, that the birds were not observed on the Shindi when it was in flowering stage and thus was occupied by honey bees. There is also presence of honey bee hive which indicates its interdependence and the linkages. During the flowering period of Shindi, i.e. in the month of December, huge number of bees were observed on the flowers collecting nectar from the flowers. The tree of Shindi is situated near the river bank, but the bee hive is situated on the lower contour of the hillock on other side of the land near the scrubby vegetation.

The birds like sunbirds, oriental white eyes were maximum observed on the trees of Mango, Tamarind and Bor.

The barbets were mainly observed on Karanja and Umbar due to their camouflage with the mentioned trees.



HERBS

No.	Common Name	Scientific Name
1.	Crofton weed	<i>Ageratina adenophora</i>
2.	Goat weed	<i>Ageratina conyzoides</i>
3.	Blue mink	<i>Ageratum houstonianum</i>
4.		<i>Alternanthera tenella</i>
5.	Blood flower	<i>Asclepias curassavica</i>
6.		<i>Cassia uniflora</i>
7.	Kurdu	<i>Celosia argentea</i>
8.		<i>Corchorus fascicularis</i>
9.		<i>Corchorus olitorius</i>
10.		<i>Indigofera linifolia</i>
11.	Star glory	<i>Ipomea hederifolia</i>
12.	Lantana	<i>Lantana camara</i>
13.	Congress grass	<i>Parthenium hysterophorus</i>
14.		<i>Tridax procumbens</i>
15.		<i>Urena obata</i>
16.	Chikat gonad	<i>Xanthium strumarium</i>
17.		<i>Acanthospermum hispidum</i>
18.		<i>Alysicarpus</i>
19.		<i>Barleria prionotis</i>
20.		<i>Biophytum reinwardtii</i>
21.		<i>Canavalia Africana</i>
22.	takla	<i>Cassia tora</i>
23.		<i>Crotolaria calycina</i>
24.		<i>Euphorbia hirta</i>
25.		<i>Grewia helicterifolia</i>
26.		<i>Hedyotis longifolia</i>
27.		<i>Hibiscus tetrophyllus</i>
28.		<i>Ipomea criocarpa</i>
29.		<i>Commelina</i>
30.		<i>Cassia mimosoides</i>



HERBS

No.	Common Name	Scientific Name
31.		<i>Trichodesma indicum</i>
32.		<i>Cardiospermum helicacabum</i>
33.		<i>Desmodium velutinum?</i>
34.		<i>Leucas urticifolia</i>
35.		<i>Rivea</i>
36.		<i>Aspidopteris cordata</i>
37.		<i>Indigoera glandulosa var</i>
38.		<i>Indigofera codifolia</i>
39.		<i>Malvastrum cormandelianum</i>
40.		<i>Rungia repens</i>
41.		<i>Spilanthus calva</i>
42.		<i>Tephrosia tinctoria</i>
43.		<i>Teramnus labialis</i>

CLIMBERS

No.	Common Name	Scientific Name
1		<i>Ipomea obscura</i>
2		<i>Ipomea muricata</i>
3		<i>Ipomea hederifolia</i>
4	Anantmul	<i>Hemidesmus indicus</i>
5	Suparnika	<i>Cryptolepis buchani</i>



TREES

No.	Common Name	Scientific Name
1.	Ain	<i>Terminalia tomentosa</i>
2.	Apta	<i>Bauhinia racemosa</i>
3.	Amba	<i>Mangifera indica</i>
4.	Asana	<i>Bridelia retusa</i>
5.	Babhul	<i>Acacia nilotica</i>
6.	Bahava	<i>Cassia fistula</i>
7.	Bhokar	<i>Cordia dichotoma</i>
8.	Bibba	<i>Semecarpus anacardium</i>
9.	Bor	<i>Ziziphus mauritiana</i>
10.	Chinch	<i>Tamarindus indica</i>
11.		<i>Grewia species</i>
12.	Henkel	<i>Maytenus senegalensis</i>
13.	Karanja	<i>Pongamia pinnata</i>
14.	Kate Sawar	<i>Bombax malabaricum</i>
15.	Kavath	<i>Limonia acidissima</i>
16.	Khair	<i>Acacia catechu</i>
17.	Kuda	<i>Holarrhena pubescens</i>
18.	Maharukh/ Mahaneem	<i>Ailanthus excelsa</i>
19.	Moha	<i>Madhuca indica</i>
20.	Moi	<i>Lannea coromandelica</i>
21.	Mokha	<i>Schrebera swietenoides</i>
22.	Neem	<i>Azadirachta indica</i>
23.	Pangara	<i>Erythrina suberosa</i>
24.	Patangi	<i>Dalbergia melanoxylon</i>
25.	Phashi	<i>Dalbergia lanceolaria</i>
26.	Sag	<i>Tectona grandis</i>
27.	Salai	<i>Boswellia serrata</i>
28.	Shewga	<i>Moringa pubescens</i>
29.	Shindi	<i>Phoenix sylvestris</i>
30.	Umbar	<i>Ficus racemosa</i>
31.	Wad	<i>Ficus benghalensis</i>
32.	Waras	<i>Heterophragma quadriloculare</i>
33.	Waval	<i>Holoptelea integrifolia</i>



INSECTS

No.	Common Name	Scientific Name
1	Buffalo tree hopper	<i>Leptocentrus taurus</i>
2	Crimson tailed marsh hawk	<i>Orthretum pruinosum</i>
3	Senegal golden dartlet	<i>Ischnura senegalensis</i>
4	Globe skimmer	<i>Pantala falvenscens</i>
5	Stick praying mantis	<i>Schizocephalus bicornis</i>
6	Grass insect	<i>Necrosia spp</i>



REPTILES

No.	Common Name	Scientific Name
1	Checkered keelback	Xenochrophis piscator
2	Common cobra	Naja naja
3	Indian Rat Snake	Ptyas mucosa
4	Salea lizards	Nilgiri Salea
5	Southern Green Calotes	Calotes calotes

MAMMALS

No.	Common Name	Scientific Name
1	Mongoose	Herpestidae
2	Bats	Rhinolophus rouxii



BUTTERFLIES

No.	Common Name	Scientific Name
1.	Lemon Pansy	<i>Junonia lemonias</i>
2.	Danaid Eggfly	<i>Hypolimnus missipus</i>
3.	Common grass yellow	<i>Eurema hecabe</i>
4.	Angled castor	<i>Ariadne ariadne</i>
5.	Plain tiger	<i>Danaus chrysippus</i>
6.	Common Crow	<i>Euploea core</i>
7.	Common Jezebel	<i>Delias eucharis</i>
8.	Blue pansy	<i>Junonia orthiya</i>
9.	Yellow Pansy	<i>Junonia hierta</i>
10.	Common Gull	<i>Cepora nerissa</i>
11.	Common Emigrant	<i>Catopsilia pomona</i>
12.	Blue tiger	<i>Tirumala limniace</i>
13.	Crimson rose	<i>Atrophaneura hector</i>
14.	Maculate lancer	<i>Salanoemia sala</i>
15.	Dark Cerulean	<i>Jamides bochus</i>

LIST OF BIRDS



Ashy prinia
Prinia socialis
Silvidae



Alexandrine Parakeets
Psittacula eupatria
Psittacidae



Barn swallow
Hirundo rustica
Hirundinidae



Black drongo
Dicrurus macrocerus



Baya Weaver
Ploceus philippinus
Passeridae



Black redstart
Phoenicurus ochruros
Muscicapidae



Black winged kite
Elanus caeruleus
Accipitridae



Common lora
Aegithina tiphia
Corvidae



Common rose finch
Carpodaceus erythrinus
Fringillidae



Coppersmith barbet
Megalaima haemacephala
Megalaimidae



Common quail
Coturnix coturnix
Phasiandae



Common tailorbird
Orthotomus sutorius



Golden oriole
Oriolous oriolus
Corvidae



Great tit
Parus major
Paridae



Greenish Warbler
Phylloscopus trochiloides
Cisticolidae



Grey wagtail
Motacilla cinerea
Passeridae



Indian Pond heron
Ardello grayi
Ardeidae



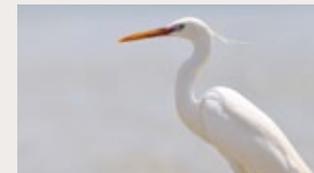
Indian cormorant
Phalacrocorax niger
Phalacrocoracidae



Indian robin
Saxicoloides fulicata
Muscicapidae



Jungle babbler
Turdoides striatus
Silvidae



Little egret
Ergetta garzetta
Ardeidae



Oriental magpie robin
Copsychus saularis
Muscicapidae



Oriental skylark
Alauda arvensis
Alaudidae



Oriental white eye
Zosterops palpebrosus
Zosteropidae

Common Name
Scientific Name
Family

Common Name
Scientific Name
Family

LIST OF BIRDS

LIST OF BIRDS



Purple rumped/sunbird
Nectarinia zeylonica
Nectarinidae



Purple sunbird
Nectarinia asiatica
Nectarinidae



Red throated/flycatcher
Ficedula parva
Muscicapidae



Red vented bulbul
Pycnonotus cafer
Pycnonotidae



Small bee eater
Merops orientalis
Meropidae



Small minivets
Pericrocotus cinnamomeus
Corvidae



Small blue kingfisher
Alcedo atthis
Alcedinidae



Tree pipit
Anthus trivialis
Passeridae



Wire tailed swallow
Hirundo smithii
Hirundinidae



Wood sandpiper
Tringa glareola
Scolopacidae



White breasted waterhen
Amaurornis phoenicurus



White throated/kingfisher
Halcyon smyrnensis
Dacelonidae

Common Name
Scientific Name
Family

LIST OF BIRDS



Red wattled lapwing
Vanellus indicus
Charadriidae



Rufous tailed shrike
Lanius isbellinus
Lanidae



Rufous treepie
Dendrocitta vagabunda
Corvidae



Scaly breasted munia
Lonchura punctulata
Passeridae



Verditer flycatcher
Eumyias thalassina
Muscicapidae



White browed wagtail
Motacilla maderaspatensis
Passeridae



White throated fantail
Rhipidura aureola
Muscicapidae



White wagtail
Motacilla alba
Passeridae



Yellow footed green/pigeon
Treron phoenicoptera
Columbidae

Common Name
Scientific Name
Family



OUR CONCEPT FOR DEVELOPMENT

Keeping the landscape in mind, and our vision for it we resolved to use eco friendly designs and concepts so that we could accommodate the habitats of the existing plants, animals, insects and butterflies in Songbirds. We created Directive Principles for the landscaping of Songbirds

Low on water consumption

This will eventually decrease the need for watering system and the maintenance of the system.

Low on maintenance

Cutting of hedges, tree shapes, lawns should be minimal. The plants should be allowed to grow as per their natural growth patterns and shapes.



Less area under lawns

Plants would be allowed to grow on different topographical areas, giving rise to a differentiation.

Less use of cement in open spaces

Instead, we chose to use open soil, sand and stone. This will allow more percolation of rainwater and cause the monsoon vegetation to bloom during the season.

Plant more trees & perennial shrubs that will get established in first 3 years of landscape development.

Create habitats and plantations in such a way that they accommodate as well as invite fauna.



ZONAL PROPOSAL FOR SONGBIRDS

Riparian zone

The area along Ram river will be protected & improved with bank treatment, special plantations, ponds, etc to conserve this special habitat that can attract good diversity of birds and insects. There will be a dense planting zone consisting of: Tree hedge (2-3 rows) with riparian tree species adjacent to bank, bank protection using local stone walls, various theme parks interconnected by walk ways, transition from one park to other to be seen in connecting walk way and themes for parks eg. Wetland garden.

Tree corridors

The tree corridors will provide habitats & movement patches for fauna. These are planned in terms of roadside avenue, hedges along walkways, boundary plantation and stream side plantations.

Stepping stones

Single trees or cluster of shrubs are planned across the built-up area to act as stepping stones for fauna movement. This will also include shrub hedges or flower beds in between buildings, podiums, parking areas.

Gardens

All the open spaces are properly planned with concepts of Eco-landscaping serving as good habitats for fauna apart from conserving resources & energy. This includes private gardens, common gardens and open spaces like grounds.

LOCATION MAP

PAUD ROAD

THE BRIDGE

FARMLAND

REPARIAN ZONE

Songbirds Boundary

MAIN ENTRANCE GATE

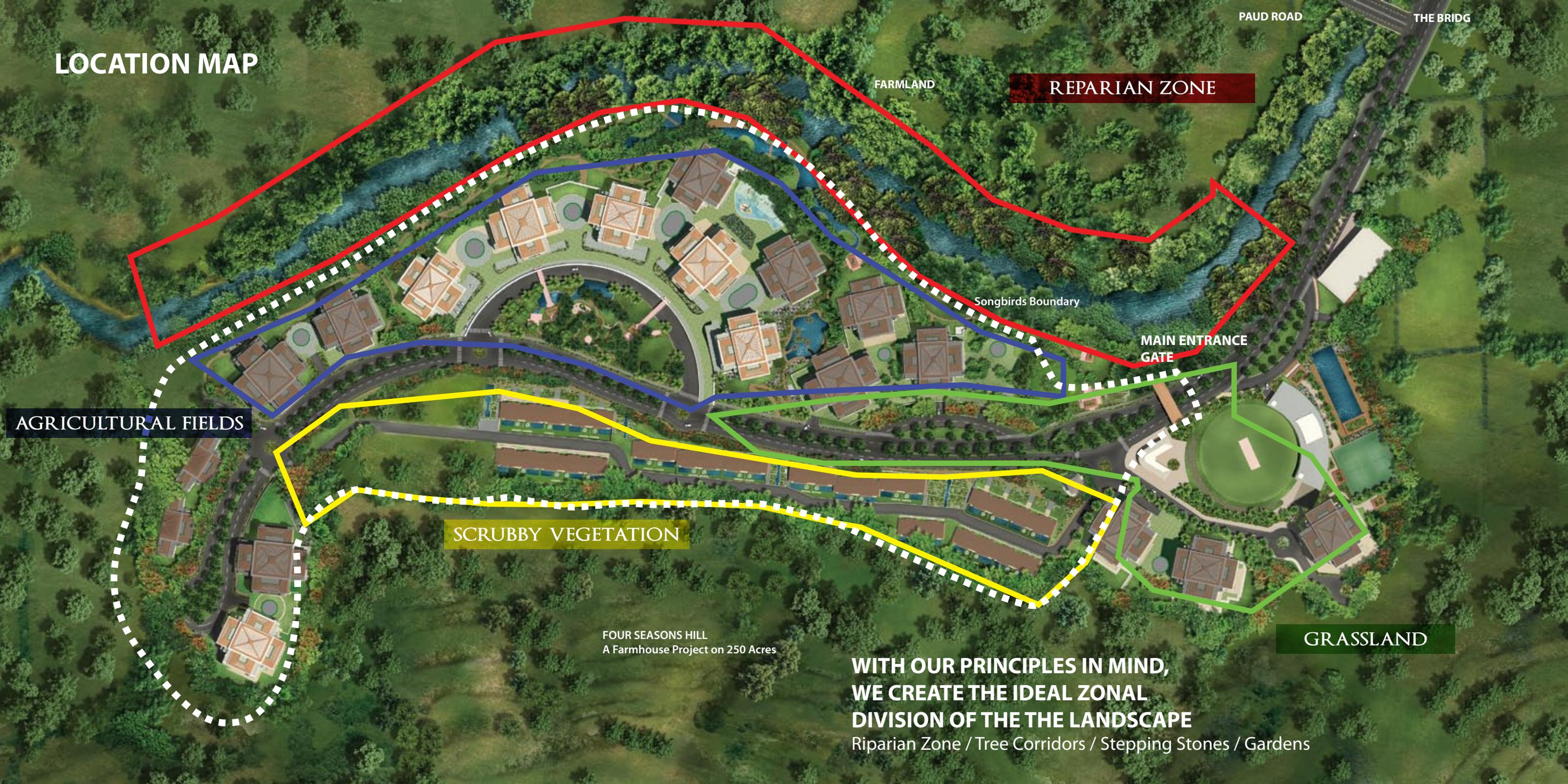
AGRICULTURAL FIELDS

SCRUBBY VEGETATION

GRASSLAND

FOUR SEASONS HILL
A Farmhouse Project on 250 Acres

WITH OUR PRINCIPLES IN MIND,
WE CREATE THE IDEAL ZONAL
DIVISION OF THE THE LANDSCAPE
Riparian Zone / Tree Corridors / Stepping Stones / Gardens



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