



**BIODIVERSITY CONSERVATION**

**FOR ECO-HOUSING**

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## **Biodiversity Conservation for Eco-housing**

Conversion, destruction and fragmentation of habitat are the single greatest threats to biodiversity. Humans have dramatically transformed landscapes to accommodate our needs for housing, transportation, food, fiber, recreation, and a host of other uses. Even places that provide open space, like public parks, hills and water bodies, may have diminished habitat value because of inadequate management, over-use, invasion by harmful exotic species, or contamination from external sources.

### **1.0 RELEVANCE TO ECOHOUSING**

Just as housing is an essential human need so is biodiversity conservation the need for sustainable development. It may be discovered that those places with gentle topography, water, mild climates and other features so attractive to people are also important for wildlife. Construction, especially through the building of structures, impervious surfaces and roads, destroys and fragments habitat and disrupts ecological processes. Invasive species thrive and pollution increases in these disturbed environments, causing numerous additional problems for native species and their habitat.

A building can be truly eco- friendly only when constructed with the least impact on the biodiversity. The impacts of construction activity are not restricted only to the actual building site but it also impacts the biodiversity at the site of disposal of construction waste, site of disposal of excavated material, at the burrowing sites for aggregate, sand, soil for bricks etc. Most of these areas are within the fringes of a city and therefore these secondary impacts need consideration.

Ecological needs are most appropriately addressed at broad scales, like at regional or state levels. At this scale, it may be possible to identify large blocks of relatively undisturbed land that provide good habitat for a broad range of species and allow natural disturbances like floods, fire, and hurricanes to shape the landscapes as they would under more natural conditions. At the macro level to address biodiversity in relevance to eco-housing, we consider it at two levels the city level and at the site level.

### **2.0 BIODIVERSITY CONSERVATION AT CITY LEVEL**

At the Pune city level various efforts are being taken to designate and conserve certain areas as biodiversity zones in the proposed development plan. The focus of these broad scaled conservation plans is on habitat protection efforts in the 23 new fringe villages that are being incorporated into the city's jurisdiction.

## 2.1 Landuse

Pune city comprises of five major habitats, the grasslands /scrub lands, the hills and forested lands, the agricultural lands, the river basins and the settlement areas. As seen from the table below from 1967 to 1998 there has been an increase of 24% in the area under settlement.<sup>1</sup> This increase is directly proportional to the decrease in the agriculture and grassland/scrubland areas.

### Landuse change at Pune Metropolitan Region

Landuse Category	Area Under Each Category (%)	
	1967	1998
Settlements	17.33	41.00
Agriculture	61.26	42.11
Water sheets	02.25	02.25
Hills and Forest	07.64	07.64
Grassland and scrub	11.52	07.00
Total	100.00	100.00

Source: - Geography of Pune Urban Area - S. B. Nalawade, Dept of Geography, Fergusson College Pune.

It can therefore be concluded that the habitats that are most impacted are the agricultural and grassland habitats. These habitats support a wide variety of faunal species such as insects, amphibians, butterflies that are impacted by the change of land use.

## 2.2 Biodiversity Habitats in Pune city

Pune city has various areas that are rich in biodiversity. These areas because of their thick tree cover not only act as the lungs of the city but also provide a haven for a large number of floral and faunal species. These areas can be categorized as a. Natural Resources and b. manmade resources.

### 2.2.1 Natural Resources

- Hills:** The city is surrounded by hills such as NDA hills, Katraj, Sinhagad, Vetal tekdi, Bhamburda, Hanuman tekdi, Taljai and Parvati- Pachgaon hills. These hill forests support nearly a fifth of the butterfly species that depend upon the food plants on these hills. These hills also exclusively host over a sixth of the bird species, seldom seen elsewhere in the city campus.<sup>2</sup>

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<sup>1</sup> Geography of Pune Urban Area - S. B. Nalawade, Dept of Geography, Fergusson College Pune.

<sup>2</sup> Ranwa Brochure – [www.ranwa.org](http://www.ranwa.org).

- 2. Water bodies:** The Mula and Mutha rivers provide habitat to a large number of reptiles, amphibians, birds and above all it supports the aquatic ecosystem in the city harbouring large number of fish population.

The hills and the water bodies of the city are the natural habitats to many of the faunal community. There has been habitat loss and habitat change due to which there has been a decline in the number of amphibians, reptiles, mammals, butterflies, birds and even insects. Amphibians are on the verge of decline and extinction because of habitat loss along the riverbed due to constructional activities. These areas therefore need to be conserved and impacts of any kind of human activities should be avoided.

The deterioration of fish population from Mula River is due to industrial effluent poured into it. The Mutha River is also much polluted because of the domestic waste and can support only few hardy varieties of fishes.

Tree snakes are affected due to fuel wood collection activity on the hills. Many of the snakes are also killed by the people visiting these area, hence certain areas on the hills should be restricted so that quiet spots can be developed which do not have any human interference.

Due to the removal of grass and shrubs and destruction of natural grassland there has been a decline in the number of insects. This has also resulted in the number of insectivorous species of birds to decline over the years. Hence in the city few areas of grassland and shrubs should be developed and the weeds that grow in the rainy season should be allowed to grow until their breeding season is over.

### **2.2.2 Manmade Resources:**

- 1. Parks:** Peshwe Park, Sarus Baug, Rajiv Gandhi Zoo, Sambhaji Park, Kamla Nehru Park have been able to sustain a certain amount of birds, insects, reptiles and mammals as these parks have matured trees. The Pune city has 60 existing public gardens and an additional 36 are proposed or being developed. These landscaped areas host some rare species of flora, which attract various faunal species too.
- 2. Manmade Lakes:** The Katraj Lake and Pashan lake, which have been formed by damming the rivers, and the Lakaki Lake formed from an excavated quarry, provide a habitat for a large number of birds and aquatic species.
- 3. Institutions and Public areas:** Law College, Fergusson College, University of Pune, Shaniwar Wada, Cantonment areas and certain areas such as temples and churches have been supporting nesting, feeding and roosting sites to many of the birds, butterflies, insects, mammals and even reptiles.

## **2.3 Sensitive Microhabitats**

In and around built-up areas, habitat conservation is more challenging. Blocks of habitat are fragmented into small patches. Streams may flow under streets and buildings. Native

vegetation has been replaced with introduced species. Human activities introduce contaminants of all sorts. However, important microhabitats remain and are deserving of protection and special management.

Within the city exist certain specific areas that either have a rare or endangered tree located or form an important habitat area for certain faunal species. The city has many residential areas with tree avenues along roadsides, these are matured trees and provide feeding, nesting and roosting sites for many birds, mammals, and insects. Historical structures, old wadas, temples, churches, and mosques tend to have matured trees and also some water bodies in their building complexes, these too provide a large number of insects, birds and mammals with nesting and roosting sites. These areas are considered as sensitive habitats and need to be conserved to sustain the biodiversity of the city.

A list of certain such specific sites identified by various experts in Pune is given below. This is not an all-inclusive list and a builder should take measures as recommended below to conserve the sensitive areas identified on the site or in the neighbourhood.

### **FLORA**

**List of heritage tree of Pune and their location.** (*Refer Annexure 1*)

**List of exotic trees in Pune and their location.** (*Refer Annexure 2*)

**List of certain rare floral species in Pune and their location.** (*Refer Annexure 3*)

### **FAUNA**

**List of sensitive habitats of faunal importance.**

1. The important roosting sites for the birds are Peshwe Park, Sarus Baug, Vaikuntha Crematorium, Police Parade Ground, Agriculture College, Pune University campus, Fergusson College Campus and Bund Garden – Koregaon Park, Empress Garden, Empress Garden Belt, Fruit Research Station (Aundh – Khadki).
2. All the hill slopes and hilltops especially the Bhamburda Vanvihar, Parvati Panchgaon and Mhatoba Shrine hill are rich in biodiversity and are a part of the faunal movement corridor.
3. The CME campus has a huge natural patch of babul plantation with marshy area. This area is favoured by a large number of insects, birds, reptiles and amphibians.
4. The Naik Island at the Mula and Mutha confluence has few trees, which support the largest number of bats. The campus of the District Magistrates bungalow near the Sangam Bridge is also a sensitive habitat for various avifauna species.
5. River courses downstream of Khadakwasla Dam and Vittalwadi area are rich in biodiversity.
6. The various lakes in and around the city, Khadakwasla Lake, Pashan lake, Katraj Lake, Lakaki Lake are habitats for various migratory and local bird species.
7. The Bird Sanctuary on the Mula Mutha River.
8. Roosting habitat for crows and egrets at K.T. Weir near Nand on the way to Pirangut from Baner.
9. Presence of rare fish species have been found in Bund Garden Yerawada area which are found to be declining in number because of introduction of exotic

- species which are of commercial importance. Thus this area needs to be protected and conserved.
10. Few genera of ants have been found restricted to Bhamburda and Pachgaon hills and thus should be conserved.
  11. Roosting sites of Flying Foxes that are sensitive:
    - a) The largest colony is near Sangam Bridge in the campus of the District Magistrates bungalow.
    - b) Fruit Research Station ( Aundh – Khadki)
    - c) On Karve Road near Mrutyunjay Temple.
    - d) At Khadakwala dam.

## 2.4 Recommendations for conservation at city levels

1. A builder should check whether any of the above mentioned sites are in the near proximity of his/her construction site and should ensure that these sites are not impacted by the activities on his/her building site.
2. PMC needs to take efforts to identify and conserve the sensitive microhabitats on public lands.
3. Plantation along public roadways and nallahs should be done with native vegetation with the intent to conserve the biodiversity of the city.
4. Certain damaged areas may be suitable for restoration. It is important to strategically conserve undeveloped lands in urbanizing areas to provide important connectivity between surrounding less developed landscapes.
5. There is a need to develop urban forest and urban farmlands as parts of cities. *Refer to box below.* These will provide breathing areas for the city as well as maintain the biodiversity of the city.
6. The impacts of activities such as excavation for aggregate, soil for bricks, and digging of sand from dry river beds should be monitored and measures taken to mitigate them.

**Urban forests** can be defined as tracts of land reserved or developed as green spaces, with a variety of native vegetation. Examples of these are the Hyde Park in London, Central Park in New York, Lalbaugh in Bangalore and Botanical Garden in Howrah. Urban forests provide shade, beauty, and habitat for urban wildlife. Properly planted trees and other urban vegetation can reduce heating and cooling costs, intercept and store rainwater, improve air quality, and increase property values and local tax bases. Properly cared for and well-managed urban forests can provide benefits that far exceed their management costs. Urban forests can also bring communities of people together and form connections between humans and the urban flora and fauna.

**Urban Farmlands** – Similar to Urban forest, it would be beneficial to have areas as urban farmlands within the city as green spaces. In new development zones, especially in the 23 additional villages recently included in the city limits, certain plots of lands that were originally farmlands should be preserved by providing incentives to the owner to maintain the farms and develop the area as a eco-tourism and agricultural tourism spot. This would help to create open breathing spaces in the city and enrich the biodiversity of the area.

## 3.0 SITE SPECIFIC CONSERVATION

Changes of land use from non-residential to a residential use or even a low-density use to a high-density use impacts the ecology of the area. Biodiversity conservation is site specific and the needs for conservation on each site would be different.

Biodiversity conservation for eco-housing has to be done before the site is built upon and not as a remedial action after the natural system has been destroyed. Thus site-specific conservation should be considered in a two-prong method, a) conservation of the existing natural habitats b) Remedial measures to restore and promote the natural biodiversity of the area.

**a) Conservation of the existing natural habitats**

1. The first step is to inventorise the naturally occurring flora and fauna on the site with the involvement of taxonomy experts and other experts. Conduct a detailed ecological survey of the site to identify floral species of trees, shrubs and even weeds. Identify the faunal species present and survey their habits in the area.
2. The natural drainage pattern on the site, its topography and slopes are also an important component of its biodiversity. These should be studied and taken into consideration during design stage. The first, second and third order streams should be maintained and not filled for leveling.
3. Based on the site inventory report identify pockets of microhabitats that need to be left undisturbed. The building layout should be designed with the aim of conserving these areas.
4. It is important to do a study of the movements of fauna in the area. A corridor study of the site and immediate surrounding area to understand the movements of fauna and the impact of construction activity on the path should be conducted, especially for those sites closer to hills forest patches.
5. The destruction of natural habitat could be because of absence of co-ordination between the various activities in the construction process. Developing a logical framework that provides a sequence of activities that ensures protection of the biodiversity of the area should be prepared. Measures should be identified to conserve the biodiversity at every stage of the design and construction activity.
6. Transplantation of trees – Not all trees require to be transplanted. Sometimes the cost of transplantation may be exorbitant, compared to the cost of planting a sapling of that species.
7. Based on the site inventory trees that need to be conserved at its present location, and trees that can be transplanted should be prioritized.
8. It should be noted that although the emphasis is on conserving and developing native vegetation trees. If existing non-native trees/exotic species exist on the site, these should not be cut to be replaced by native vegetation.

**b) Remedial measures to restore and promote the natural biodiversity of the area.**

Once the site has altered it is impossible to regain the original natural biodiversity of the area. Remedial actions are therefore focused towards creating a conducive urban niche for the flora and fauna that have been displaced from the site.

1. Plant only native species in the landscaped area. Plant trees of species that existed naturally on the site before development.

2. Alternate paths should be identified and developed for the fauna movement wherever old paths have been altered.
3. Landscape for the building should be designed to integrate the conserved pockets of microhabitats.
4. Create urban niches to form environments conducive for fauna. *Refer to Need for Creating Urban niches in Report on Native Fauna of Pune.*
5. Landscape of the building should be designed to recreate the natural connections of the site with the surrounding area and not in isolation.
6. Provide for areas of natural growth in the landscape design that would allow weeds and seasonal plants to grow, as these would attract insects and consequently other fauna.
7. Buildings should not only have landscaped areas but also provide for children playgrounds where games such as cricket can be played.

#### 4.0 FUTURE MEASURES

To promote biodiversity conservation for eco-housing there are various measure that need to be taken. These measures would create a resource base that can assist individual builders to access the impacts of the project on the biodiversity of the region.

1. Damage to biodiversity and impacts from construction are many a times mainly because of absence of knowledge and awareness. Builders, civil engineers and architects need to be educated on ways to conserve the biodiversity during development stages.
2. A training Programme for Architects, Landscape architects and civil engineers.
3. There exists a need to generate a larger awareness regarding the impacts of the construction activity on the environment. Public awareness needs to be created to educate the buyer of residential properties of the importance of eco-friendly construction.
4. Need to prepare a detailed study of movements of fauna in Pune city from surrounding areas.
5. Need to prepare a GIS based biodiversity map of Pune, which displays the various Biodiversity habitats and sensitive microhabitats of Pune.
6. Prepare Gardens of Pune GIS based database, with information about the various species of flora and fauna present in each garden.
7. PMC should develop a list of trees that are recommended for transplantation. This list should be flexible enough, to permit changes depending upon the site inventory for selecting trees for transplantation.
8. One exercise that requires to be undertaken would be for experts to visit four sites that are under construction and record the various activities undertaken that are changing/destroying the biodiversity of the area.
9. Approximately 30,000 acres of Defense Land (Cantonment Board) exists in and around Pune City, much of this land is barren. These lands if planted with trees and preserved would provide the City of Pune with the much needed green cover.

## Annexure 1

### List of heritage tree of Pune and their location.

Compiled by – Prof. S. D. Mahajan & Mr. S. Inghalikar

Sr. No.	Botanical name	Vernacular Name	Location best seen at
1	<i>Mammea suriga</i> (Buch- Ham. Ex. Roxb.) Kosterm	Surangi	Popular, Deccan Gymkhana
2	<i>Murraya paniculata</i> (L.) Jacq.	Kunti	Smriti Karyalaya, Deccan Gymkhana
3	<i>Pterospermum acerifolium</i> Willd.	Muchkund	Sane Dairy, Bhandarkar road
4	<i>Albizzia lebbek</i> (L.) Bth.	Shirish	Film India Road
5	<i>Albizzia amara</i> Boiv.	Kala shirish	ARAI Road
6	<i>Ehretia laevis</i> Roxb.	Anjan	Near Rajaram Bridge, Karve Road
7	<i>Ehretia aspera</i> Roxb.	Datrang	ARAI Road
8	<i>Salix tetrasperma</i> Roxb.	Valunj	In front of Bhawe School, Karve road
9	<i>Schembra</i> sp.	Makhar	M.I.T. Paud Road
10	<i>Morinda pubescens</i> J.E.Sm.	Bartondi	Padale Place, Nal Stop
11	<i>Manilkara</i> sp.	Khirmi	Law College Road
12	<i>Cochlospermum religiosum</i> (L.) Alst.	Ganeri	Near Chitranjan Vatika, Model Colony
13	<i>Creteva adansonii</i> Ssp. odora (Buch. Ham.) Jacobs.	Vayvarn	Sailesh Society, Karvenagar
14	<i>Sapindus laurifolius</i> Vahl.	Ritha	Fergusson Road
15	<i>Capparis grandis</i> L.	Panchunda	Parvati Foothill
16	<i>Madhuka longifolia</i> Mecbr.	Moha	Agricultural College, Ganeshkhind Road
*17	<i>Amoora Rohituka</i> W.& A.	Rakhtrohida	Jogeshwari
18	<i>Clerodendron phlomidis</i> L. f.	Eeran	Ayurveda Rasashala, Karve Road
*19	<i>Alianthus excelsa</i> Roxb.	Maharukh	Fergusson Road
*20	<i>Holoptelea</i> sp.	Vavla	Parvati
21	<i>Saraca indica</i> L.	Sitecha ashok	In front of P.Y.C. Gate
*22	<i>Aegle marmelos</i> , Corr.	Bel	Near Pandit Bunglow, L.C.Road
*23	<i>Feronia</i> sp.	Kavath	Fergusson Road
24	<i>Mitragyna</i> sp.	Kalam	Prabhat Road to Bhandarkar Road
25	<i>Derris scandens</i> Benth.	Garud vel	Prabhat Road to Bhandarkar Road
*26	<i>Santalum album</i> L.	Chandan	Law College Road
27	<i>Bombax ceiba</i> L.	Savar	Dandekar Pull, Sinhagad Road
28	<i>Butea frondosa</i> Koing	Palas	Kasat Chemical, Karve Road
29	<i>Caryota urens</i> L.	Bhelari maad	Aryabhushan Press, Fergusson Road
30	<i>Alstonia scholaris</i> , R. Br.	Satvani	Fergusson Road
31	<i>Ougeinia oajainensis</i> Hochr.	Kala palas	Garware College, Karve Road
32	<i>Callophyllum inophyllum</i> L.	Undi	Garware College, Karve Road
33	<i>Garcinia indica</i> Chois.	Kokam	Shruti Mangal Karyalaya, Apte Road
34	<i>Caesalpinia bonducella</i> Flem.	Sagargota	Behind Kirloskar Cummins
*35	<i>Pongamia pinnata</i> Pier.	Karanj	Wadeshwar , Fergusson Road

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36	<i>Dolichandrone falcata</i> Seem.	Medasinghi	Near Pune University Nursery
37	<i>Heterophragma</i> sp.	Varas	S.N.D.T Road.
<b>Sr.No.</b>	<b>Botanical name</b>	<b>Vernacular Name</b>	<b>Location best seen at</b>
38	<i>Adhatoda beddomei</i> C.B.Clarke	Adulsa	Belbaug, Laxmi Road
39	<i>Capparis zeylanica</i> L.	Vaghati	ARAI Road, LaxmiNagar Road, Parvati Foothill
40	<i>Cordia myxa</i> L.	Bhokar	Market Yard Road
41	<i>Terminalia arjuna</i> W. & A.	Arjun	S.P. College, Tilak Road
42	<i>Terminalia belerica</i> Roxb.	Beheda	Ashtang Ayurved College
*43	<i>Ficus</i> sp.	Nandruk	Pune University
*44	<i>Boswellia</i> sp.	Salai	Law College Hill
*45	<i>Odina</i> sp.	Moya	Law College Hill
46	<i>Schleichera</i> sp.	Kusumb	Law College
47	<i>Dichrostachys</i> sp.	Sigam kati	Modi Ganpati, Narayan Peth
*48	<i>Phyllanthus emblica</i> L.	Amla	Mrutunjay Society, Kothrud
*49	<i>Cassia fistula</i> L.	Bahava	Dhanukar Colony
50	<i>Bauhinia racemosa</i> Lam.	Apta	Law College Hostel
51	<i>Vallisneria spiralis</i> Spr.	Vish-mougri	Alka Theature / Law College Road
52	<i>Cordia rothii</i> Roem & Schult.	Gondan	Apte Road to Vaishali Hotel
53	<i>Anogeissus sericea</i> Brand.	Reshmi dhavda	Patrakar Nagar / Wadiya Hospital
54	<i>Dillenia indica</i> L.	Motha karmal	Patrakar Nagar
55	<i>Lagerstroemia reginae</i> Roxb.	Taman	Swanand Society, Saharkarnagar
*56	<i>Neolamarkia cadamba</i> , Miq.	Kadamb	Laxminarayan, Satara Road
57	<i>Mimusops elengi</i> L.	Bakul	Shaniwarwada
*58	<i>Dalbergia paniculata</i> Roxb.	Funshi	Tulsibaugwale Co. First Lane
*59	<i>Phoenix sylvestris</i> Roxb.	Shendi	Swekar Hotel, Nal Stop
60	<i>Wattakaka</i> sp.	Hirandodi	Parvati Foothill
61	<i>Pergularia</i> sp.	Utarn	Parvati Foothill
62	<i>Solanum verbascifolium</i> L.	Kutri	Left Lane of Shaniwarwada
63	<i>Gmelina arborea</i> Roxb.	Shivan	Swanand Society, Saharkarnagar
64	<i>Maerua</i> sp.	Mirva	Vadjai Road, Saharkarnagar
65	<i>Spondias pinnata</i> (L. f.) Kurz.	Ambada	Prabhat Road
66	<i>Barringtonia acutangula</i> Gaert.	Nevar	Road in front of Karnatak School, Erandwana

\* These trees are not important as Heritage trees, but have been included in the list so that tree lovers can identify and see the species in its full form.

## Annexure 2

### List of Exotic trees in Pune and their location.

Compiled by – Prof. S. D. Mahajan & Mr. S. Inghalikar

Sr.No.	Botanical name	Vernacular Name	Location best seen at
1	<i>Acrocarpus</i> sp.	Tokfal	Mayur Colony, Kothrud
2	<i>Adansonia</i> sp.	Gorakhchinch	Desai Bungalow, Koyaji Road, Camp
3	<i>Melochia</i> sp.		Gol Market, Aundh Road
4	<i>Tabubia argentia</i>		Road in front of P.Y.C. Gate
*5	<i>Tabubia rosea</i>		Saras Baug
6	<i>Castanospermum</i> sp.	Australian ceshnut	In front of New English School, Pantancha Goth
*7	<i>Kigelia</i> sp.	Cannon ball	Balgandharva, J.M.Road
8	<i>Markhamia</i> sp.		BMCC Road
*9	<i>Sterculia foetida</i> L.	Jangli badam	Nal Stop
10	<i>Erythrina</i> sp.	Pandhara Pangara	Apte Road
11	<i>Bixa</i> sp.	Shendri	Ideal Colony, Kothrud
12	<i>Bryonia</i> sp.		Mahajani Path, Bhandarkar Raoad
13	<i>Bauhinia</i> sp.	Kanchanraj	Agharkar Institute
14	<i>Bauhinia semla</i> Wunderlin	Semal kanchan	Agharkar Institute, Mitramandal
15	<i>Bauhinia variegata</i> L.	Pandhara Kanchan	Gokhale Institute, BMCC Road
16	<i>Peltophorum</i> sp.		Swekar Hotel Road
17	<i>Cassia</i> sp.		Agricultural College to Ganeshkhind Road
*18	<i>Cassia grandis</i> L.f.		Navsahyadri Society, Karve Road
*19	<i>Cassia javanica</i> Spr.		Ganesh Malla, Dattawadi
*20	<i>Tabubia</i> sp.		Venkateshwara, Sinhagad Road
21	<i>Colvillea racemosa</i> Boj. Baltt. & Mill.	Manimohar	Tilak Smarak Mandir
*22	<i>Parkia biglandulosa</i> W.&A.	Chendufali	Prabhat Road
23	<i>Guazuma</i> sp.		Law College Road
24	<i>Averrhoa</i> sp.	Kamarak	Prabhat Road to Bhandarkar Road
25	<i>Lagerstroemia</i> sp.		Prabhat Road to Bhandarkar Road
*26	<i>Diospyros perigrina</i> (Gaertn) Gurke	Temru	Bhandarkar Road
*27	<i>Ceiba pentandra</i> (L.) Gaertn.	Pandhara savar	Natraj, Deccan Gymkhana
*28	<i>Sweitenia mahagonii</i> (L.) Jacqb.	Mohgany	Prabhat Road
*29	<i>Khaya</i> sp.		Lal Mahal to Sakal Office
30	<i>Gmelina asiatica</i> L.	Kali Shivan	Corporation, Nava Pull
*31	<i>Millingtonia hortensis</i> L.f.	Buch/ Akashnimb	Film Institute, Law College Road
32	<i>Atrocarpus</i> sp.	Nir phanas	Prayag Hospital, Deccan Gymkhana
*33	<i>Terminalia catappa</i> L.	Badam	Kasat Chemicals, Karve Road
34	<i>Citharexylum</i> sp.	Sitaranjan	Senapati Bapat Road

Sr.No.	Botanical name	Vernacular Name	Place
35	<i>Bignonia</i> sp.		Balgandharva, J.M.Road
36	<i>Chameodaraelegans</i> sp.		In front of Congress Bhawan
37	<i>Cupressus</i> sp.		Manohar Karyalaya
38	<i>Couroupita guianensis</i> Abul	Kailashpati	Kamla Nehru Park Road
39	<i>Delonix</i> sp.	Pandhara gulmohar	Parvati
40	<i>Avocado</i> sp.		Bharti Niwas Society, Prabhat Road
41	<i>Pinus</i> sp.		Mayur Colony, Kothrud
42	<i>Elaeis</i> sp.		Training College, Laxmi Road
*43	<i>Areca catechu</i> L.	Supari	Natu Baug, Bajirao Road
*44	<i>Broussonetia</i> sp.		Agricultural College Chowk
45	<i>Elaeodendron</i> sp.		Law College
46	<i>Araucaria</i> sp.		L.I.C.Colony, Karvenagar
47	<i>Chorizia</i> sp.		In front of Lakaki Bungalow, Model Colony
48	<i>Pseudobombax</i> sp.		Swanand Society, Sahakarnagar
49	<i>Amherstia</i> sp.	Urvashi	Pakharbaug, Bavdhan
50	<i>Cycas</i> sp.		Nal Stop to Law College Road

\* These trees are not important as Heritage trees, but have been included in the list so that tree lovers can identify and see the species in its full form.

### **Annexure 3**

#### **List of certain rare floral species in Pune and their location.**

Compiled by – Dr. Vinaya Ghate

<b>Sr.No.</b>	<b>Botanical name</b>	<b>Vernacular Name</b>	<b>Place</b>
1	<i>Alstonia machrophylla</i> Wall		Model colony Post Office lane, Mithapali estate- Bank of India's compound
2	<i>Bauhinia hookeri</i> F. Muell.	Shwetkanchan	Maharashtra Vidyan Vardhini
3	<i>Bauhinia retusa</i> Roxb.		Maharashtra Vidyan Vardhini
4	<i>Calophyllum inophyllum</i> L.	Undi	Garware College, Karve Road
5	<i>Castanospermum australe</i> lunn		Ghatge Patil Transport Office Lane, opp New English School on Tilak road.
6	<i>Chorisia speciosa</i> St.		Model Colony, Yena bungalow compound, Paud road
7	<i>Citharexylum subserratum</i> Sw.	Sitaranjan	Training College Campus, Sadashiv Peth, Sambhaji Park and Tulsibaug
8	<i>Commifera mukul</i> Engl	Guggul	Jawaharlal Nehru Medicinal Plants Museum and Garden
9	<i>Couropita guayanensis</i> Aubl	Gauripati	Kamla Nehru Park
10	<i>Duabunga sonnerationides</i> Ham.		Forest Dept. Nursery Hadapsar
11	<i>Harpulia zanguebarica</i>		Botany Dept. University of Pune
12	<i>Hura crepitans</i> L.		Maharashtra Vidyan Vardhini
13	<i>Madhuka longifolia</i> Macrb.	Moha	Agricultural College, Ganeshkhind Road
14	<i>Mammea suringa</i> Kostcrm	Surangi	Popular, Deccan Gymkhana
15	<i>Ochna squarrosa</i> L.	Kanak champa	Botany Dept. University of Pune
16	<i>Ougeinia oajainensis</i> Hochr.	Kala palas	Garware College, Karve Road
17	<i>Parmentiera cereifera</i> Seem.		Botany Dept. University of Pune