

# **Iringole Kavu**

## **A Potential Biodiversity Heritage Site in Kerala**

### **A Study Report**



**Prepared by**

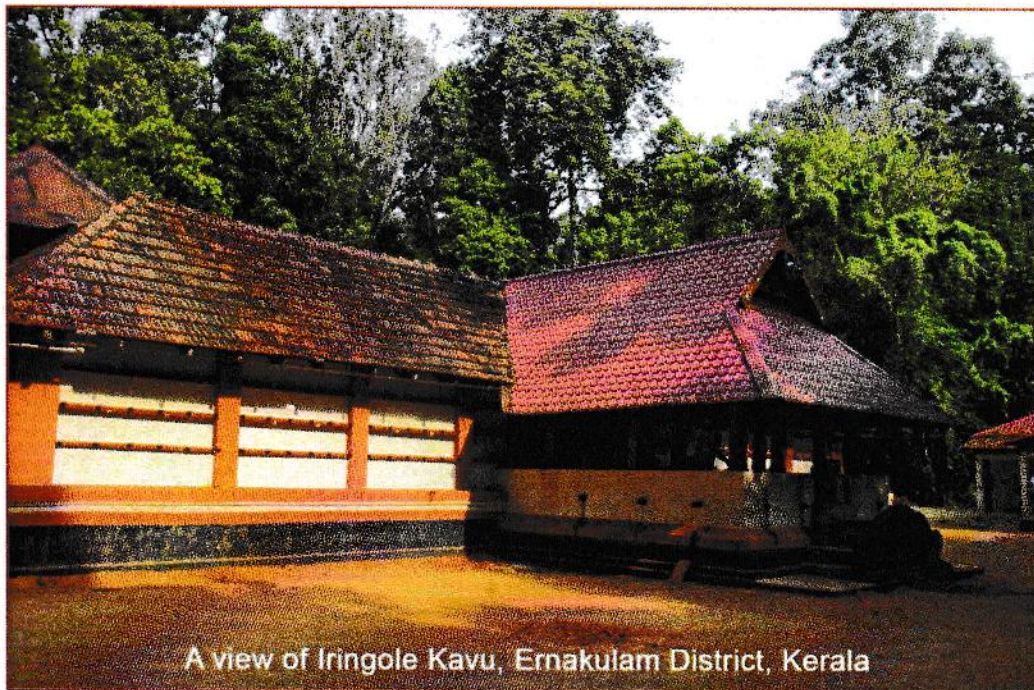
**U.M. Chandrashekhara**  
**Kerala Forest Research Institute Sub Centre**  
**Nilambur**

**Submitted to**  
**Kerala State Biodiversity Board, Thiruvananthapuram**



## 1. INTRODUCTION

Sacred groves represent patches of forests protected by assigning them as the abode of Gods and Goddesses. In India, in spite of a general very high land to man ratio, sacred groves have survived under a variety of ecological situations. Sacred groves are considered as one of the land use systems with ecological and socio-cultural importance in the region. Well conserved sacred groves may be compared with the regional natural forests for various ecological attributes. Very often, in a given region, the stand quality of sacred groves is better than that of several natural forests. Sacred groves are also the treasure of rare and endemic species. Sacred groves often serve as the last refuge for many wild plants and animals. The role of well managed sacred groves as the gene-pool gardens for *in-situ* conservation of genetic resources has been appreciated by many workers. In fact, sacred groves can also be considered as gene-banks of several economically important plants. Being the landscape unit in a rural landscape, the sacred grove performs several ecological functions, which directly or indirectly can help in the maintenance of ecosystem health of all interacting landscape units. Iringole Sree Bhagavati Kavu (here after Iringole Kavu) in Kerala is one such sacred grove of the country. In this report, ecological and socio-cultural dimensions of Iringole Kavu- a potential place to be declared as Heritage Site are presented.



A view of Iringole Kavu, Ernakulam District, Kerala

## 2. LOCATION DETAILS

Iringole Kavu ( $10^{\circ} 06' 31.20$  N;  $76^{\circ} 30' 01.54$  E) is located 2 km away from Perumbavoor town between Perumbavoor and Kothamangalam on Aluva- Kothamangalam road (Figure 1). The KavU is located about 500 m towards the south direction from the main road (Figure 2). Nedumbassery is the nearest airport, which is 22 km away. Aluva and Ernakulam are the railway stations, which are 18 km and 42 km away respectively from Iringole. Iringole KavU covers about 16 ha area (Figure 3) with about 15.6 ha area covered by a typical lowland evergreen forest and the remaining about 0.4 ha area, in the middle of the forest, comprising the temple complex. The temple and the forest were once owned by 32 *illoms* (residence of brahmins). They now come under the Travancore Dewaswom Board. Day to day activities related to the sacred grove will be carried out by the Iringole Sree Bhagavathy Kshethra Upadeshaka Samithi. The Secretary, Iringole Sree Bhagavathy Kshethra Upadeshaka Samithi, Iringole, Perumbavoor, Ernakulam District may be contact to know more about this sacred grove.

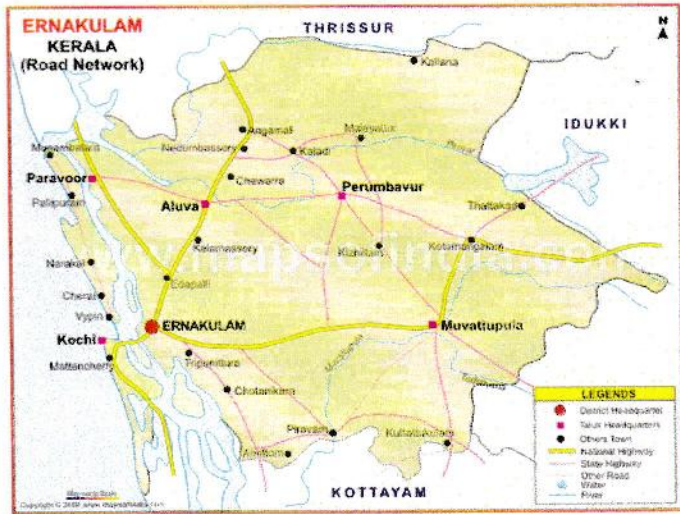


Figure 1. The road map of Erakulam District, Kerala showing the location of Iringole Kavay

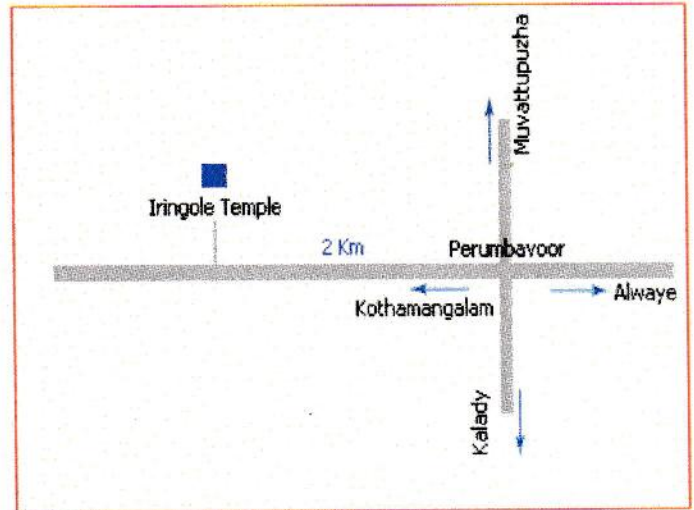


Figure 2. A schematic diagram indicating the location of Iringole Kavay.

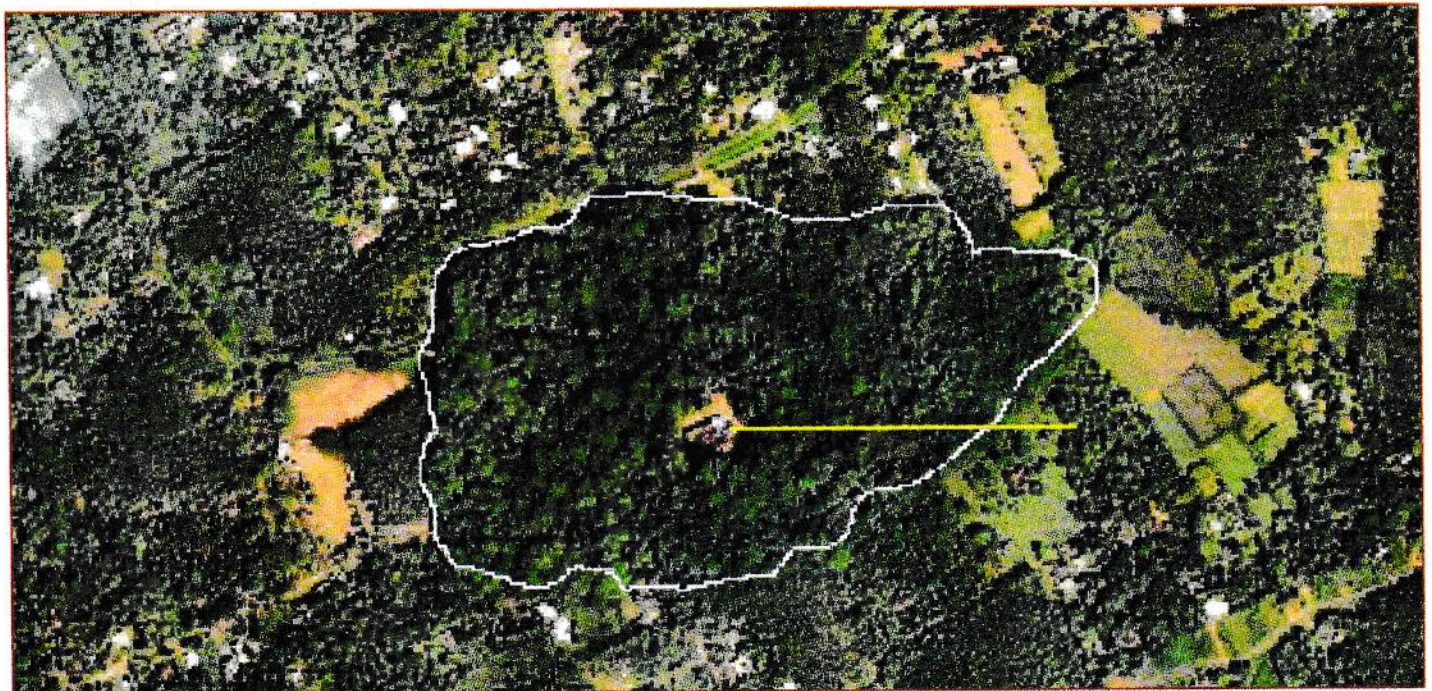
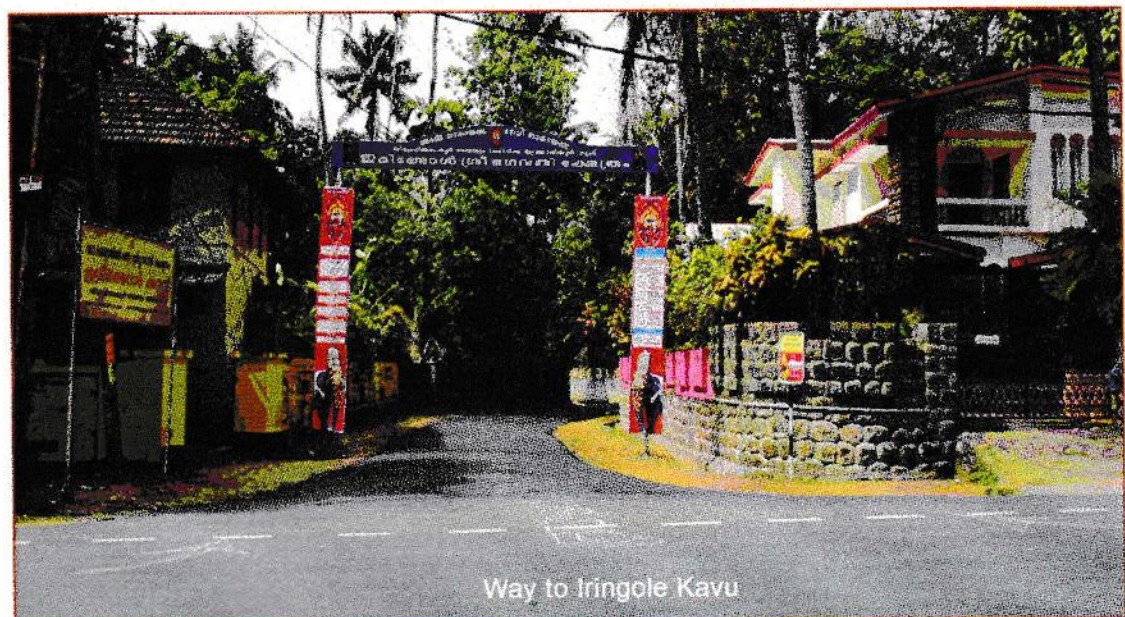


Figure 3. A satellite map showing the forest and temple complex of Iringole Kavay.



### 3. BRIEF DESCRIPTION OF THE SPIRITUAL AND CULTURAL BACKGROUND OF IRINGOLE KAVU

According to the book published by the Iringole Kavu, the main deity Bhagavati of the grove is Yogamaya of Bhagavatha. The story goes this way. Mother Earth, unable to bear the burden of sins committed by evil kings and rulers, appealed to Brahma, the Creator for help. Brahma prayed to the Supreme Lord Vishnu, who assured him that he would soon be born on earth to annihilate tyrannical forces. One such evil force was Kamsa, the ruler of Madhura and his people were utterly terrified of him. On the day Kamsa's sister Devaki was married off to Vasudeva, an akashvani or voice from the sky was heard prophesying that Devaki's 8th son would be the destroyer of Kamsa. Thus Kamsa imprisoned Devaki and Vasudevan and in fear and fury he killed their seven sons. Vasudevan decided to save his eighth son from the danger at any cost. The parents shifted baby Sree Krishna to Dhwaraka soon after he was born and placed another girl baby in the cradle. Kamsa decided to kill the girl baby too; yet realising she was not the eighth son of Vasudevan. He lifted the baby furiously above his head, but miraculously the baby became a supernatural power and remained in the atmosphere as "IRRINNOLE". Later this area was named as "IRINGOLE". It is believed that the gods and goddesses surrounded the power in the forms of trees and plants. And later the area developed into a beautiful thick forest.

It is believed that the main deity (Bhagavati) in this Kavu present in her original three forms of power namely in the form of Saraswathy (the power of knowledge) during morning time, Vana Durga (the power of forest) in the noon and Bhadra kali (the power of fury and termination) during night. For the rituals perfumes and fragrant flowers are not allowed. Only the flowers of chethi (*Ixora coccinea*) and thamara (lotus; *Nelumbo nucifera*) and leaves and flowers of thulasi (*Ocimum sanctum*) are used.

The temple and the forest were once owned by 32 *illoms* (residence of brahmins). However, even from the earlier times the sacred grove had cultural linkages with the *Pulaya* community. The grove was very much associated with the agriculture in the surrounding area. For instance, the traditional *vithidal*, on the *Sankranthi* day of the Malayalam month of *Kumbham* is being conducted outside the temple. That day marks the first harvesting of the rice and offering it first to the deity for the thanks giving offer. Involvement of different communities, associated with agriculture, in the traditional functions and rituals, clearly indicate the cultural importance of this sacred grove in the rural landscape. Mainly three festivals are also celebrated in the grove. While, *Pooram*- annual festival usually held in March every year, *Thrikarthika*- the deity's birth day is celebrated on the *Kartika Nakshatram* (star) in the Malayalam month of *Vrischikam* (November – December). On the *Karthika* day of every month species pooja will be performed, as this day is associated with the birth star of the deity.

### 4. FLORA AND FAUNAL DIVERSITY IN IRINGOLE KAVU

Iringole Kavu, situated at an elevation of 43 m above mean sea level receives an average annual rainfall ranges between 3200 to 3400 mm with heavy rainfall during southwest monsoon season (nearly 67% of total rainfall of the year) followed by northeast monsoon. The mean monthly maximum temperature ranges from 28.1 to 31.4°C and the minimum ranges from 23.2 to 26°C. The maximum temperature occurs during March and April months and the minimum temperature occurs during December and January months. The humidity ranges from 68 to 89% during morning hours and 64 to 87% during evening hours. The maximum humidity is observed during May to October months. The soil is lateritic, well drained, acidic with mean pH value of 4.82 and low in organic carbon content (0.74%) (Chandrashekara and Sankar, 1998).

In Iringole Kavu, toally 49 tree species were recorded (Table 1). *Hopea ponga* and *Artocarpus hirsutus* are the dominant species in all three stages namely mature tree (individuals with gbh more than 30.1 cm), sapling (individuals with 10.1 to 30.0 cm gbh) and seedlings (individuals with girth <10.0 cm and height <1 m). The estimated total aboveground biomass, annual increment in biomass and net primary productivity of tree components in this Kavu are 7,72,884 Kg ha<sup>-1</sup>, 8,084 Kg ha<sup>-1</sup> yr<sup>-1</sup> and 19,000 Kg ha<sup>-1</sup> yr<sup>-1</sup> respectively. These values are comparable to those obtained for several relatively undisturbed evergreen and semi-evergreen forest stands in Kerala. The size class distribution of trees in Iringole Kavu showing a typical exponential curve with a clear preponderance of stems of small girth classes indicates the better regeneration potential of the site (Figure 4).

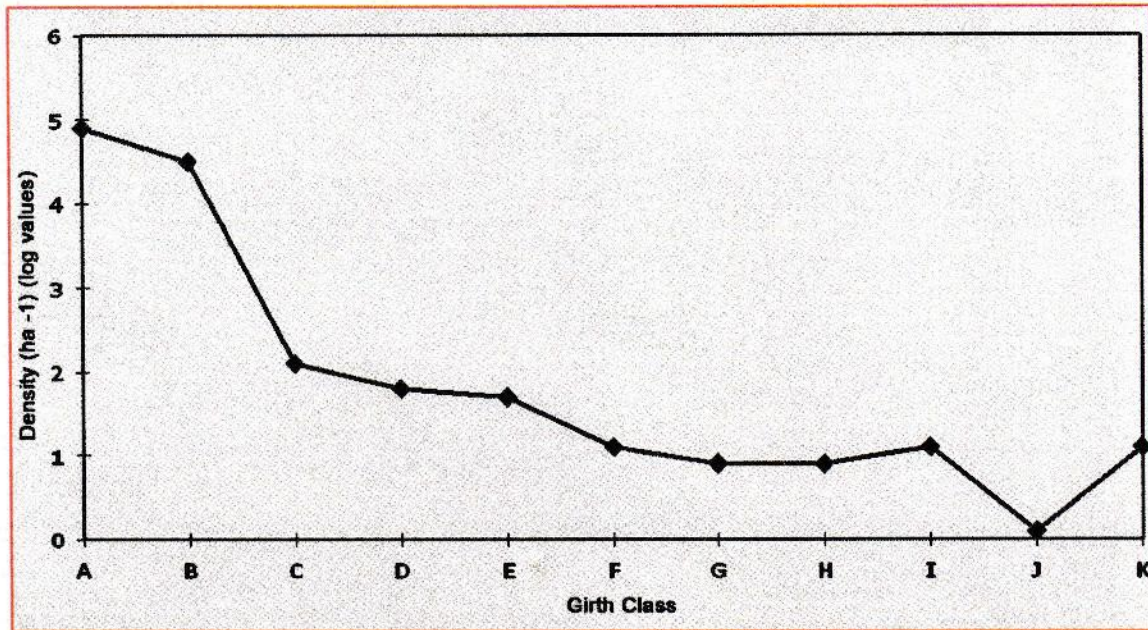


Figure 4. Density (plants ha<sup>-1</sup>) distribution of tree seedlings, saplings and mature trees into size-classes in Iringole Kavu



Table 1. Tree species recorded from Iringole Kavu (Source: Chandrashekara and Sankar, 1998).

Species	Family	Common Name
<i>Adenanthera pavonina</i>	Mimosaceae	Manchadi
<i>Aglaiia elaeagnoidea</i> *	Meliaceae	Punyava
<i>Antiaris toxicaria</i> **	Moraceae	Maravuri
<i>Antidesma montanum</i>	Euphorbiaceae	Putharavalli
<i>Antidesma menasu</i>	Euphorbiaceae	Putharaval
<i>Antidesma zeylanicum</i>	Euphorbiaceae	Tathalmaram
<i>Aporusa bourdillonii</i> ***	Euphorbiaceae	Vetti
<i>Aporusa lindleyana</i>	Euphorbiaceae	Vetti
<i>Arenga wightii</i>	Arecaceae	Malan thengu
<i>Artocarpus hirsutus</i> ***	Moraceae	Anjili
<i>Borassus falbellifer</i>	Arecaceae	Karimpana
<i>Canthium umbellatum</i>	Rubiaceae	Irumbarappan
<i>Celtis timoresensis</i>	Ulmaceae	Vellakuyyan
<i>Caryota urens</i>	Arecaceae	Choondappana
<i>Cinnamomum malabathurum</i> **	Lauraceae	Vayana
<i>Ficus tsjahela</i>	Moraceae	Chela
<i>Ficus mysorensis</i>	Moraceae	Chela
<i>Ficus virens</i>	Moraceae	Cherala
<i>Flocourtia montana</i>	Flocourtiaceae	Charalapazham
<i>Garcinia gummi-gutta</i>	Clusiaceae	Kodappuli
<i>Holigarna arnottiana</i> ***	Anacardiaceae	Cheru
<i>Hopea parviflora</i> ***	Dipterocarpaceae	Irumbakam
<i>Hopea ponga</i> ***	Dipterocarpaceae	Naikambakam
<i>Hydnocarpus pentandra</i> ***	Flacourtiaceae	Kattumarotti
<i>Ixora brachiata</i>	Rubiaceae	Marachethi
<i>Litsea laevigata</i> ***	Lauraceae	-
<i>Macaranga peltata</i>	Euphorbiaceae	Vattamaram
<i>Mammea suriga</i>	Clusiaceae	Shurum punna
<i>Mangifera indica</i>	Anacardiaceae	Mavu
<i>Mesua ferrea</i> ***	Clusiaceae	Nanku
<i>Mallotus tetracoccus</i>	Euphorbiaceae	Vattakumbil
<i>Myristica malabarica</i> ***	Myristicaceae	Pathiripoovu
<i>Nothopegia beddomei</i> **	Anacardiaceae	Paecheru
<i>Pajanelia longifolia</i>	Bignoniaceae	Payyani
<i>Olea dioica</i>	Oleaceae	Edana
<i>Persea macrantha</i>	Lauraceae	Kulamavu
<i>Polyalthia fragrans</i> ***	Annonaceae	Nedunar
<i>Prunus zeylanica</i>	Rosaceae	Attanariponga
<i>Quassia indica</i>	Simaroubiaceae	Njotta
<i>Streblus asper</i>	Moraceae	Paruvamaram
<i>Strychnos nux-vomica</i>	Loganiaceae	Kanjiram

\*, Endemic to peninsular India; \*\*, Endemic to Western Ghats, India;

\*\*\*, Endemic to South-western Ghats, India.

(cont'd).

Table 1 (cont'd). Tree species recorded from Iringole Kavu (Source: Chandrashekara and Sankar, 1998).

<i>Syzygium cumini</i>	Myrtaceae	Njaval
<i>Syzygium rubikundam</i>	Myrtaceae	Pillanjaval
<i>Trema orientalis</i>	Ulmaceae	Amathali
<i>Tabernaemontana heyneana</i> **	Apocynaceae	Kundalappala
<i>Vateria indica</i> ***	Dipterocarpaceae	Painimaram
<i>Vitex altissima</i>	Verbenaceae	Mylellu
<i>Wrightia tomentosa</i>	Apocynaceae	Thondipala
<i>Zanthoxylum rhetsa</i>	Rutaceae	Mullilam

\*, Endemic to peninsular India; \*\*, Endemic to Western Ghats, India;

\*\*\*, Endemic to South-western Ghats, India.

An unpublished research report entitled 'Ecosystem structure and dynamism, biodiversity and human dimensions and their linkages of Iringole Sacred Grove in the Western Ghats of India' (KFRI Research Project Number 519/06) provides the information on insect, spider, amphibians, reptiles and mammal diversity in Iringole Kavu. In this grove, 38 species of spider (Table 2), 8 species amphibians (Table 3), 75 species of insects (Table 4,) 14 species of reptiles (Table 5) and 9 species of mammals (Table 6) were identified.

Table 2. Spiders in Iringole Kavu (Source: Unpublished report of KFRI 519/06).

<i>Argiope anasuja</i>	<i>Hippasa greenalliae</i>
<i>Argiope pulchella</i>	<i>Leucauge pondae</i> *
<i>Argyrodes ambalikai</i>	<i>Leucauge tessellata</i>
<i>Asemonea tenuipes</i>	<i>Nephila kuhlii</i>
<i>Bavia kairali</i> *	<i>Nephila pilipes</i>
<i>Cyrtophora cicatrosa</i>	<i>Olios iranii</i>
<i>Cyrtophora unicolor</i>	<i>Opadometa fastigata</i>
<i>Diaea elongata</i>	<i>Oxyopes javanus</i>
<i>Epeus indicus</i> *	<i>Oxyopes lineatipes</i>
<i>Epeus tener</i>	<i>Oxyopes quadridentatus</i>
<i>Eriovixia excelsa</i>	<i>Oxyopes rufisternum</i>
<i>Eriovixia laglaizei</i>	<i>Oxyopes sunandae</i> *
<i>Gasteracantha geminate</i> +	<i>Parawixia dehaani</i>
<i>Hasarius adansoni</i>	<i>Pisaura gitae</i> *
<i>Hermippus arjuna</i> +	<i>Poecilotheria striata</i> *
<i>Hersilia savignyi</i>	<i>Psechrus torvus</i>
<i>Heteropoda latreille</i>	<i>Telamonia dimidiata</i>
<i>Heteropoda nilgirina</i> *	<i>Thomisus lobosus</i> *
<i>Heteropoda venatoria</i>	<i>Thomisus pugilis</i>

\*, Endemic to India; +, Endemic to India and Sri Lanka

Table 3. Amphibians in Iringole Kavu (Source: Unpublished report of KFRI 519/06).

<i>Bufo melanostictus</i>	<i>Philautus pulcherrimus</i> *
<i>Euphlyctis cyanophlyctis</i>	<i>Philautus variabilis</i>
<i>Hoplobatrachus tigerinus</i>	<i>Polypedates pseudocruciger</i> *
<i>Philautus charius</i> *	<i>Sylvirana temporalis</i> *

\*, Endemic to Western Ghats

Table 4. Insects in Iringole Kavu (Source: Unpublished report of KFRI 519/06)

<b>LEPIDOPTERA</b>	<b>HYMENOPTERA</b>
<i>Cethosia nietneri*</i>	<i>Apis indica</i>
<i>Curetis thetis*</i>	<i>Camponotus compressus</i>
<i>Danaus chrysippus</i>	<i>Delta conoidus</i>
<i>Elymnias hypermnestra</i>	<i>Dyodercus cingulatus</i>
<i>Euploea core</i>	<i>Eucophylla smaragdina</i>
<i>Eurema hecabe</i>	<i>Ropalidia spatulata</i>
<i>Graphium sarpedon</i>	<i>Sceliphron coromandelicum</i>
<i>Hypolimnas bolina</i>	<i>Sceliphron madraspatnam</i>
<i>Ixias pyrene+</i>	<i>Spex fabricii</i>
<i>Junonia iphita</i>	<b>COLEOPTERA</b>
<i>Kaniska canace</i>	<i>Alaus speciosus</i>
<i>Leptosia nina</i>	<i>Dyndymus sanguineus</i>
<i>Loxura atymnus</i>	<i>Epepeotes uncinates</i>
<i>Mycalesis perseus</i>	<i>Xylotrupes gideon</i>
<i>Neptis jumbah#</i>	<b>HEMIPTERA</b>
<i>Pachliopta aristolochiae</i>	<i>Cletus bipuntanks</i>
<i>Pachliopta hector+</i>	<i>Dictophara viridissima</i>
<i>Papilio clytia</i>	<i>Dindymus sanguineus</i>
<i>Papilio dravidarum*</i>	<i>Dysdercus cingulatus</i>
<i>Papilio helenus</i>	<i>Kalidasa lanata</i>
<i>Papilio polymnestor+</i>	<b>DICTYOPTERA</b>
<i>Papilio polytes</i>	<i>Leptomantris parva</i>
<i>Parantica aglea</i>	<b>PHASMIDA</b>
<i>Pareronia valeria</i>	<i>Carausius morosus</i>
<i>Parthenos Sylvia#</i>	<i>Phyllium crurifolium</i>
<i>Psolos fuligo</i>	<b>ODONATES</b>
<i>Tanaecia lepidea#</i>	<i>Aethrimanta brevipennis</i>
<i>Tirumala limniace</i>	<i>Ceriagrion cerinorubellum</i>
<i>Troides minos*</i>	<i>Copera marginipes</i>
<i>Ypthima huebneri</i>	<i>Copera vittata</i>
<b>Moths</b>	<i>Cratilla lineata</i>
<i>Astictopterus jama</i>	<i>Diplocodes trivialis</i>
<i>Enmonodia vespertito</i>	<i>Neurothemis fulvia</i>
<i>Hyposidra infixaria</i>	<i>Neurothemis tullia</i>
<i>Hyposidra talaca</i>	<i>Neurothemis tullia</i> , <i>Neurothemis tullia</i>
<i>Ischyja manlia</i>	<i>Orthetrum sabina</i>
<i>Mocis frugalis</i>	<i>Palpopleura sexmaculata</i>
<i>Pericallia recini</i>	<i>Trithemis festiva</i> ,
<i>Perina muda</i>	<i>Trithemis pallidinervis</i>
<b>DIPTERA</b>	<i>Vestalis gracilis</i>
Cuckoo wasp	<b>THYSANURA</b>
<i>Xylocopa verticalis</i>	<i>Lepisma saccharina</i>

\*, Endemic to Western Ghats; +, Endemic to India and Sri Lanka; #, Protected under Wildlife Act



Table 5. Reptiles in Iringole Kavu (Source: Unpublished report of KFRI 519/06).

<i>Ahaetulla nasutus</i>	<i>Hemidactylus frenatus</i>
<i>Calotes calotes</i>	<i>Lissemys punctata punctata</i>
<i>Calotes versicolor</i>	<i>Mabuya carinata</i>
<i>Cnemaspis kandiana</i>	<i>Mabuya macularius</i>
<i>Dendrelaphis tristis</i>	<i>Melanochelys trijuga coronata</i>
<i>Elaphe helena</i>	<i>Ptyas mucosus</i>
<i>Hemidactylus brooki</i>	<i>Xenochrophis piscator</i>

Table 6. Mammals in Iringole Kavu (Source: Unpublished report of KFRI 519/06).

<i>Bandicota bengalensis</i>	<i>Paradoxurus hermaphroditus</i>
<i>Cynopterus sphinx</i>	<i>Prionailurus viverrinus</i>
<i>Funambulus palmarum</i>	<i>Rattus norvegicus</i>
<i>Lepus nigricollis</i>	<i>Rattus rattus</i>
<i>Macaca radiata</i>	

## 5. WATER BODIES IN IRINGLOLE KAVU

Iringole Kavu is associated with two fresh water ponds. The people residing adjacent to the grove believe that these water bodies to certain extent indirectly meet the water needs agricultural fields. They also believe that the nutrients flow through the sacred groves to adjacent crop lands enrich the soil. Linkages between the sacred groves and agro-ecosystems were also realized by the local people. For instance, according to the local people, Iringole kavu is the abode of various organisms whose food chain is connected through prey-predator interactions. The birds and bats find their natural nesting places in the grove. They, in addition to their scavenger role check the insect and pest population. The bird droppings rich in phosphorus replenish the phosphorus deficient soil of the region. Snakes and mangoose find their home in sacred groves. The snake controls the rodent population, which if left unchecked will destroy the crops of the locality. The snake population is kept under check by the mangoose. Insect fauna, particularly the bees make their hives in sacred grove and facilitate the cross-pollination of many plant species of the locality.

## 6. BIODIVERSITY SIGNIFICANCE

Iringole Kavu is harboring several endemic and rare, threatened and endangered flora and fauna. For instance, *Canthium travancoricum*, *Cinnamomum malabathrum*, *Dalbergia horrida*, *Hopea parviflora*, *Hopea ponga*, *Ixora lanceolaria*, *Polyalthia fragrans*, *Psychotria flavida*, *Vepris bilocularis*, *Amorphophallus commutatus*, *Artocarpus hirsutus* and *Curcuma calcarata*- all are endemic to the Southern Western Ghats are seen in the grove. Species like *Ampelocissus indica*, *Glycosmis macrocarpa*, *Nothopegia beddomei* and *Vepris bilocularis* which fall under rare species category, critically endangered species like *Hopea ponga*, *Hopea parviflora* and vulnerable species like *Aporosa bourdillonii*, *Myristica malabarica* and *Begonia trichocarpa* are present in the grove. Several insects and spiders which are endemic to the Western Ghats or India noticed in this grove are listed in Tables 2, 3, and 4.

## 7. LANDUSE AND LAND COVER ADJACENT TO IRINGLOLE KAVU

Iringole Kavu is surrounded by residences, paddy fields, rubber and coconut groves and homegardens. Due to change in adjacent landscape units (eg. from coconut gardens to rubber gardens) and also heavy wind in the year 1998, several trees in the northern side of the grove have fallen down. Thus, changes in landuse pattern adjacent to sacred grove can trigger the alteration of forest stand structure and also the composition in sacred grove

Table 5. Reptiles in Iringole Kavau (Source: Unpublished report of KFRI 519/06).

<i>Ahaetulla nasutus</i>	<i>Hemidactylus frenatus</i>
<i>Calotes calotes</i>	<i>Lissemys punctata punctata</i>
<i>Calotes versicolor</i>	<i>Mabuya carinata</i>
<i>Cnemaspis kandiana</i>	<i>Mabuya macularius</i>
<i>Dendrelaphis tristis</i>	<i>Melanochelys trijuga coronata</i>
<i>Elaphe helena</i>	<i>Ptyas mucosus</i>
<i>Hemidactylus brooki</i>	<i>Xenochrophis piscator</i>

Table 6. Mammals in Iringole Kavau (Source: Unpublished report of KFRI 519/06).

<i>Bandicota bengalensis</i>	<i>Paradoxurus hermaphroditus</i>
<i>Cynopterus sphinx</i>	<i>Prionailurus viverrinus</i>
<i>Funambulus palmarum</i>	<i>Rattus norvegicus</i>
<i>Lepus nigricollis</i>	<i>Rattus rattus</i>
<i>Macaca radiata</i>	

## 5. WATER BODIES IN IRINGLOLE KAVU

Iringole Kavau is associated with two fresh water ponds. The people residing adjacent to the grove believe that these water bodies to certain extent indirectly meet the water needs agricultural fields. They also believe that the nutrients flow through the sacred groves to adjacent crop lands enrich the soil. Linkages between the sacred groves and agro-ecosystems were also realized by the local people. For instance, according to the local people, Iringole kavau is the abode of various organisms whose food chain is connected through prey-predator interactions. The birds and bats find their natural nesting places in the grove. They, in addition to their scavenger role check the insect and pest population. The bird droppings rich in phosphorus replenish the phosphorus deficient soil of the region. Snakes and mangoose find their home in sacred groves. The snake controls the rodent population, which if left unchecked will destroy the crops of the locality. The snake population is kept under check by the mangoose. Insect fauna, particularly the bees make their hives in sacred grove and facilitate the cross-pollination of many plant species of the locality.

## 6. BIODIVERSITY SIGNIFICANCE

Iringole Kavau is harboring several endemic and rare, threatened and endangered flora and fauna. For instance, *Canthium travancoricum*, *Cinnamomum malabathrum*, *Dalbergia horrida*, *Hopea parviflora*, *Hopea ponga*, *Ixora lanceolaria*, *Polyalthia fragrans*, *Psychotria flavida*, *Vepris bilocularis*, *Amorphophallus commutatus*, *Artocarpus hirsutus* and *Curcuma calcarata*- all are endemic to the Southern Western Ghats are seen in the grove. Species like *Ampelocissus indica*, *Glycosmis macrocarpa*, *Nothopegia beddomei* and *Vepris bilocularis* which fall under rare species category, critically endangered species like *Hopea ponga*, *Hopea parviflora* and vulnerable species like *Aporosa bourdillonii*, *Myristica malabarica* and *Begonia trichocarpa* are present in the grove. Several insects and spiders which are endemic to the Western Ghats or India noticed in this grove are listed in Tables 2, 3, and 4.

## 7. LANDUSE AND LAND COVER ADJACENT TO IRINGLOLE KAVU

Iringole Kavau is surrounded by residences, paddy fields, rubber and coconut groves and homegardens. Due to change in adjacent landscape units (eg. from coconut gardens to rubber gardens) and also heavy wind in the year 1998, several trees in the northern side of the grove have fallen down. Thus, changes in landuse pattern adjacent to sacred grove can trigger the alteration of forest stand structure and also the composition in sacred

Iringole kavu is an age old landscape unit in the rural landscape. Within this sacred grove, it appears that no major landuse shift happened in the recent past.

## 8. THREATS

Associated with faiths, taboos and beliefs over period local people have developed a strong affinity towards temple and the forests of Iringole Kavu. The local people in general, also believe that their livelihood, security and cultural existence are complementary to the blessings of the deity of Iringole kavu. However, due to change in economic and socio-cultural scenario in the region, the forested land of the grove is facing several threats.

They are listed below:

- a) Trespassing and damaging the wildings and established seedlings and poles.
  - b) Illegal collection and removal of firewood and small fallen timbers
  - c) Dumpage of solid waste materials
  - d) Incidence of illegal activities by antisocial elements
  - e) Premature fall of trees due to lack of wind break
  - f) Increase in tourism activity
- a) Trespassing and damaging the wildings and established seedlings and poles.

Illegal entry into the sacred grove and trampling of wildings and established seedlings in some parts of the grove are not uncommon. Similarly, during festivals, people also enter into the forest and trample the established seedlings. These activities are leading to poor regeneration of forest species and invasion of exotic weeds in the grove.

- b) Illegal collection and removal of fire wood and small fallen timbers

Some of the local people also reported the illegal collection and removal firewood and small timbers from the sacred grove.

- c) Dumpage of solid waste materials

In the peripheral region of Iringole Kavu, shopkeepers and some of the residents dump solid waste materials including plastic items, vegetable wastes, kitchen wastes and old cloths etc. The visitors also discard the plastic materials such water bottles, wrappers of food and confectionary items, carry bags etc. in the grove. Dumpage of solid wastes, if not controlled, not only affect the beauty of the grove but also ecological functions of the system.



Solid waste dumped in the Iringole Kavu

#### d) Incidences of illegal activities by antisocial elements

Local people reported that in certain parts of the grove, activities by antisocial elements can be seen often. People also feel that they are unable to control or stop such activities because the antisocial elements even attack them.

#### e) Premature fall of trees due to lack of wind break

In the southern part of the grove, about 6-8 years back a large number of trees have fallen down leading to opening of the canopy and invasion of light demanding exotic weeds. This was mainly due to the lack of wind break adjacent to the grove. Earlier, lands adjacent to the southern part of the grove were occupied by mixed species farms and coconut farms. However, many of these farms have been converted into rubber plantation. In this process of landuse conversion, the windbreak has lost which led to falling of trees during heavy wind.



#### f) Increase in tourism activity

A considerable increase in number of visitors to the sacred grove can be seen in recent years. A large number of visitors do not consider their visit to this grove as an eco-pilgrimage but their visit will be pleasure trips. As a result, they do not give much importance to the sanctity of the grove and integrity of forest ecosystem.

### 9. PROPOSAL FOR MASURES TO OVERCOME THREATS TO IRINGOLE KAVU

Iringole Kavuu represents a community-based conservation area having biodiversity, ecological, traditional, cultural and social importance. This can also become a model sacred grove for effective conservation of biological and cultural diversity through participation of all stakeholders to overcome all existing threats and weaknesses. Thus the management objectives should be to ensure that all activities which adversely affect the conservation and management of forest vegetation of the sacred grove are effectively curtailed and to enhance the biodiversity, ecological and cultural values of Iringole Kavuu.

The traditional institution and present legal framework indicate that the management of the Iringole Kavuu rests with the Travancore Devaswam Board. There is an Advisory Board (Iringole Sree Bhagavathy Kshethra Upadeshaka Samithi) for co-ordinating and monitoring financial aspects with respect to the festivals, functions and general day-to-day activities. This Advisory Board acts as a representative body of devotees. The Travancore Devaswam Board and the Advisory Board are ready to coordinate and implement any activity proposed for better management of the Kavuu. They also mobilize different government and non-government

agencies and devotees for the successful implementation of management activities. They also constantly chalk out future programmes aiming to conservation and sustainable management of Iringole Kavu.

Local and outside devotees, Travancore Devaswam Board, shop owners, youth clubs, near by schools and colleges, Forest Department, Municipality and Panchayat are the major stakeholders of Iringole Kavu. The stakeholders pointed out that their co-operation and support will be there for all the eco-developmental activities envisaged in this Management Plan. Youth clubs of the localities are ready to become active stakeholders by assisting in organizing people, conducting seminars, exhibitions and trainings related to sacred grove conservation. Local schools are ready to organize excursions and field trips to children from other schools also for creating awareness about the multi-fold functions of sacred groves in the rural landscape. Municipality and Panchayath are ready to be active in awareness campaigns that will be a helping hand for the Iringole Kavu Advisory Committee to bringing their issues and problems at a decision and policy making authorities. Discussion with devotees indicated that they are committed to promote eco-pilgrimage and involve in all activities related to conservation and sustainable management of Iringole Kavu.

Following are some of the specific activities proposed for conservation and sustainable management of Iringole Kavu.

#### **A. Awareness programmes**

Regular and continuous awareness programmes need to be organized for different sections of people. The aim of each programme should be to disseminate information such as ecological, cultural, biological and social dimension of sacred groves and also ways and means by which different stakeholder groups can contribute for the conservation and management of sacred groves.

Apart from the scheduled awareness programmes, necessary support should be provided for awareness visits and camps by near by colleges and schools to appreciate the multi-fold importance of Iringole Kavu.

The Advisory Board should constitute a sub-committee comprising of teachers, representatives from youth clubs and NGO's to plan, to co-ordinate and organize awareness programmes.

#### **B. Engaging protection watchers during festival and fire seasons**

During festivals, each day thousands of devotees visit the temple. The visitors are not supposed to enter into the forest and disturb the vegetation and animals there. However, in recent years many visitors disrespect the customs and entering into the forest, which is leading to the destruction of seedlings and poles and loss of many species. Similarly, some parts of the groves are fire prone due to sparse natural vegetation and high infestation of weeds. Therefore, to protect the forest area from the people and fire temporary recruitment of protection watchers is becoming a necessity.

#### **C. Barbed wire fencing to prevent trespassing, litter and biomass removal.**

The barbed wire fence covering about 1 km length around the grove is required to prevent trespassing, dumping of household and market wastes inside the grove and also illegal removal of biomass from the grove. By having the barbed wire fence around visibility of the grove will not be affected. Necessary fund may be made available to the Advisory Board of Iringole Kavu to undertake this task. The Board, however, should make sure that while fencing land is not lost from the Kavu and the vegetation is not affected.

#### **D. De-silting and cleaning the pond**

Of the two fresh water ponds located in the Iringole Kavu one is partially filled with silt. In this pond, profuse algal

growth and accumulation of a large quantity of solid wastes are responsible for poor quality of water. Therefore, de-siltation and cleaning of the pond is needed. This work can be carried out by the Advisory Committee without damaging plants growing around and adversely affecting ambience of the Kavu.

#### **10. MONITORING AND EVALUATION**

An Expert Committee may be constituted by the Kerala State Biodiversity Board to monitor the activity on regular basis. The committee can also give necessary input to the agency/ies for the successful completion of the activities envisaged in the Management Plan. The committee can formulate certain criteria and indicators to evaluate the activities undertaken by different agencies and assess the impact of each activity on promoting conservation and sustainable management of the grove.

ॐ

വന മദ്ധ്യത്തിൽ ഒരു ദുർഗ്ഗാദേവി ക്ഷേത്രം

# ഇരിങ്ങോൾ കാവ്

തിരുവിതാംകൂർ ദേവസ്വം ബോർഡ്

തൃക്കാരിയൂർ ഗ്രൂപ്പ്, ചിററിശ്ശരം സബ് ഗ്രൂപ്പ്

➔ 500 മീറ്റർ

