

WILDLIFE MITIGATION MEASURES PLAN

WILDLIFE MITIGATION MEASURES PLAN FOR DIVERSION OF 0.9856HA OF FOREST LAND IN S.F.NOS. 954-956, 959-965, 970-972, 977 & 978 (PART-1) (0.21.12), (PART-2) (0.11.44) (PART-3) (0.66.00) OF AYARANAPALLI PANCHAYAT, SHOOLAGIRI TALUK, KRISHNAGIRI DISTRICT, WHICH IS CLASSIFIED AS "UN-ASSESSED WASTE - VANASARAGAM" FOR 110KV TRANSMISSION LINE FROM RAYAKOTTAI - KELAMANGALAM ROAD TO TATA ELECTRONICS COMPANY.

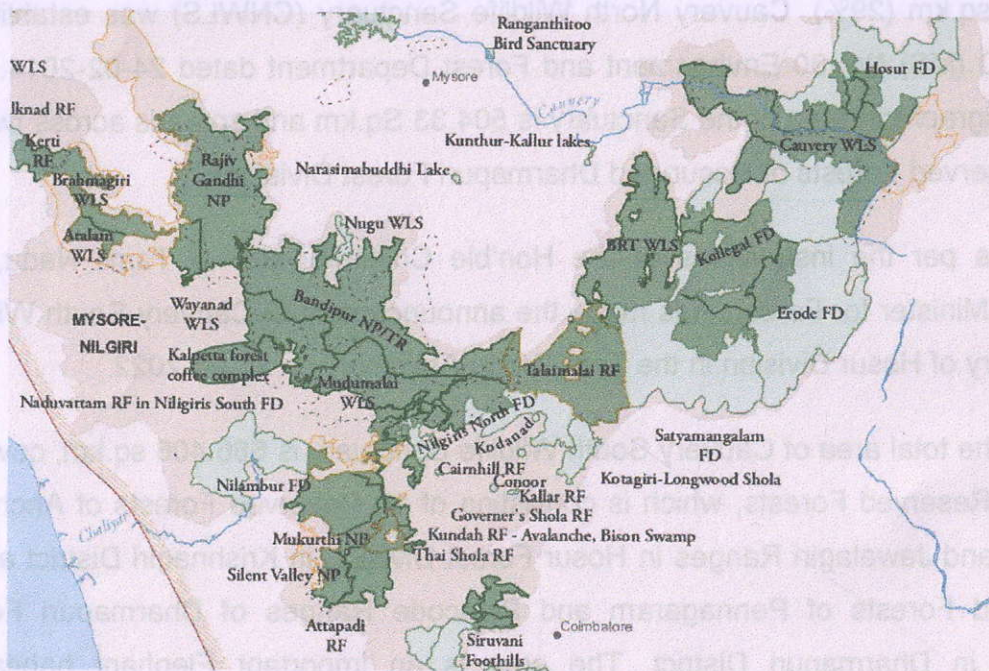
The total geographical area of Krishnagiri District is 5143 sq.km, out of which the total area under forests in Hosur Forest Division in Krishnagiri District is 1491.64sq.km (29%). Cauvery North Wildlife Sanctuary (CNWLS) was established vide G.O (MS) No. 30 Environment and Forest Department dated 24-02-2014. The total geographical area of the Sanctuary is 504.33 Sq.km and spreads across twenty four Reserved Forests of Hosur and Dharmapuri Forest Divisions.

As per the instructions of the Hon'ble Chief Minister of Tamil Nadu, the Hon'ble Minister for Forests has made the announcement of Cauvery South Wildlife Sanctuary of Hosur Division in the Tamil Nadu Assembly on 26-04-2022.

The total area of Cauvery South Wildlife Sanctuary is 686.406 sq.km, covered with 20 Reserved Forests, which is consisting of 15 Reserved Forests of Anchetty, Urigam and Jawalagiri Ranges in Hosur Forest Division in Krishnagiri District and 5 Reserved Forests of Pennagaram and Palacode Ranges of Dharmapuri Forest Division in Dharmapuri District. The area is an important Elephant habitat in Southern India and is critical for a large number of riverine species dependent on river Cauvery. The proposed area is a contiguous stretch of forests. It is located between the Cauvery North Wildlife Sanctuary of Tamil Nadu and Cauvery Wildlife Sanctuary in the state of Karnataka.

This Division is known for their rich floristic and faunal diversity. It accounts for 468 species of Plants, 36 species of Mammals, 272 species of Birds and 172 species of Butterflies which includes rare, endemic and endangered species such as Grizzled Giant Squirrel, Four-horned antelope, Leopard, Elephants, Dhole, Sloth bear etc.

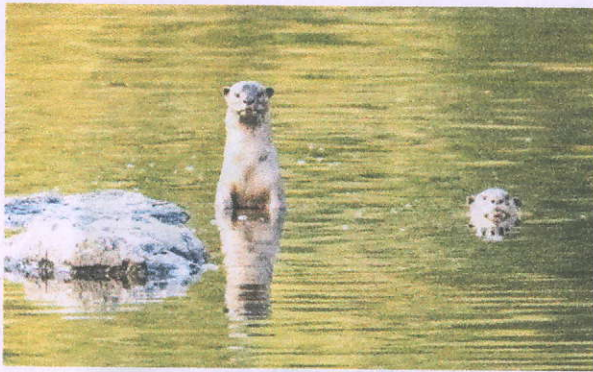
Hosur Forest Division is part of the Nilgiri - Eastern Ghats Elephant Reserve. The contiguous landscape of forests that spread across Tamil Nadu and Karnataka provides an ideal habitat for various forms of wildlife. This Division has connectivity to the complex landscapes comprising the Nilgiri hills of Tamil Nadu, Bandipur - Nagarhole Protected Area of Karnataka, Wyanad of Kerala, Biligiri Ranganatha Swamy Temple Sanctuary of Karnataka adjoining the Sathiyamangalam Tiger Reserve and Dharmapuri Forest Divisions. This contiguous and complex landscape helps in migration of wildlife and hence serves as a potential corridor for large mammals such as Asian elephants, Bengal Tiger, Leopard, etc.



The movement of wildlife especially Elephants can be feasible only through various protection and conservation measures.

This division has rich in biodiversity, these species depend directly on the riparian reserve forests like *Deccan Mahseer*, *Hump backed Mahseer*, *Soft shelled turtles*, *Grizzled Giant Squirrel*, *Smooth-coated Otter*, *Marsh Crocodile*, *Four-horned Antelope*, *Lesser Fish Eagle*, etc., are red-listed and are in urgent need for focused conservation efforts and protection of their habitat. Significant trees such as *Terminalia arjuna*, *Hardwickia binata*, *Madhuca longifolia*, *Diospyros malabarica* etc., occur here.

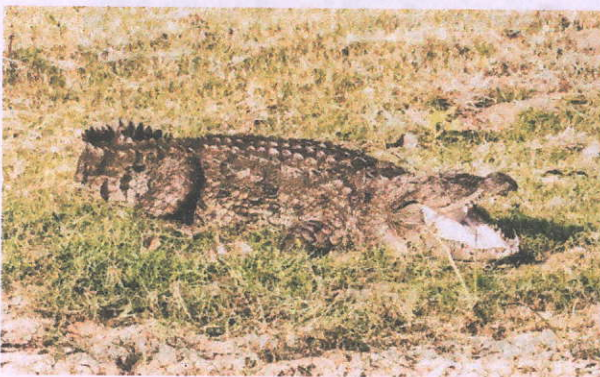
Smooth-coated Otter



Grizzled Giant Squirrel



Marsh Crocodile



Asian Elephant



Leith's softshelled turtle



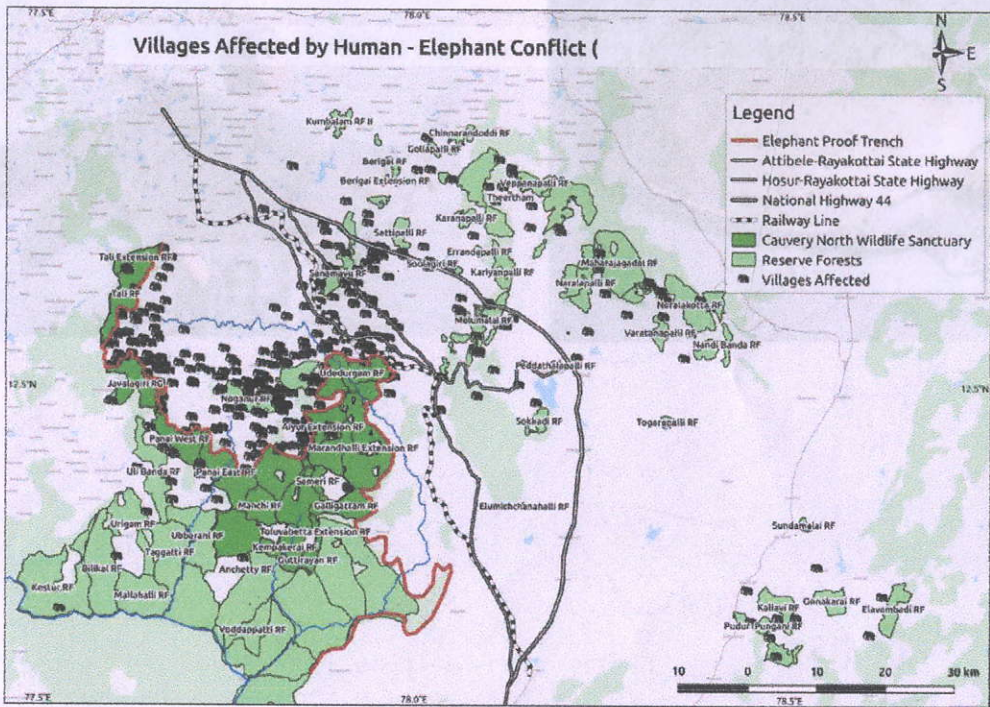
Humpback Mahseer



Map showing movement of crop raiding elephants in Hosur Forest Division

The map displays the Hosur Forest Division, which is divided into several ranges: Hosur Range, Jawalagiri Range, Rayakotta Range, and Denkanikotta Range. It also shows the Udedurgam Reserve Forest (RF) and the Panai RF. The map is bordered by the Tamil Nadu State to the west and the Kanyakumari State to the south. A legend in the bottom right corner indicates that red arrows represent 'Forward movement' and blue arrows represent 'Return movement'. The map shows numerous red and blue arrows indicating the paths of crop-raiding elephants across the forested areas and into the surrounding agricultural land.

Forests of Hosur.

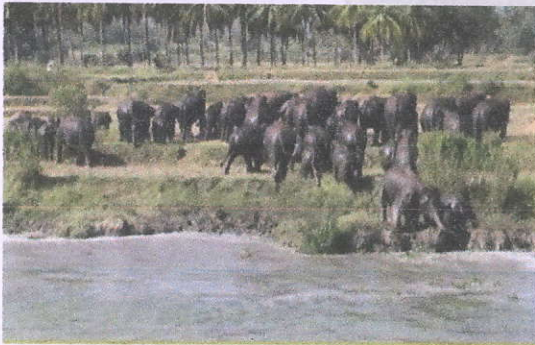


Elephant movement season:

When the grass and other palatable species dry out in winter and further during summer inside the forest areas, the Elephants moved outside the Reserve Forest areas for their favourite crop Ragi, Horse gram, Sugarcane, Banana, Vegetables and also for water. The *movement season is from October – April* coinciding with the harvest season of these crops and elephants move along the forest fringe areas which have around 150 - 200 villages & hamlets. During this season, herds of 40-70 Elephants are come out from the Reserved forests.

During such movement, conflicts like crop damages, property damages, human casualties, etc., are found to happen due to the disturbance caused by humans, leading to Human - Elephant Conflict, which is very common in this tract. Peak conflict season is November-March. Majority of the affected areas are in Denkanikottai, Jawalagiri, Rayakottai, Hosur, Shoolagiri, Veppanapalli, Maharajakadai areas, because of the movement of elephants from Thally RF, Jawalagiri RF, Denkanikottai RF, Noganoor RF, Udedurgam RF and Sanamavu RF.

Herd of Elephants in Agriculture land



Risk of safe guarding public life



Crop damage



Human casualty



2:00

LTE



Prakash Javadekar ✓

2 h · 🌐

Happy to know that a sub adult female elephant who fell into an open well in Dharmapuri in Tamil Nadu was rescued by the forest team after hours of operation, which included supplying food also. It was a 50 feet deep well that the elephant fell into.

Commendable work by the team and kudos to the elephant also for her will.



Background information:

Details of damages caused by Elephants

Sl. No.	Details	Average incidents per year	Average compensation amount distributed	Average area affected	Crops damaged by Wild animals
1.	Crop damages	900 – 1000 Nos.	75 – 80 lakhs	200 – 250 ha	Trampling and Consumption: Ragi, Paddy, Tomato, Carrot and other Flower crops.
2.	Human Casualties	8 – 10 Nos.	35 – 40 lakhs	--	--

To fulfill the requirements of food, water and also for reproducing the healthy offspring, there has been an increase in the movement of elephant herds into the human habitation and hence incidences of crop raid, cattle and human injury has also been in increasing trend.

Elephant being the Schedule-I animal and also the flagship species of this division, hence protecting this animal has been one of the main objectives of the Division. Apart from protection of this wildlife, the Division also has a major role in protecting the welfare of the local people.

All across the lands where elephants raid crops, thousands of farmers spend the nights guarding over crops from the harvest time. They spend the daytime tending their fields and running their daily lives. Due to this, the sleep of the farmers is severely disturbed and their health is also affected.

Compensation for crop damage is perceived as being a cumbersome process and too little too late, creating a bitter feeling among the farmers. This anger and frustration is directed at the staff, often agitated against the forest department. The most commonly heard position among the farmers is that "the Forest department should keep 'their' elephants inside the forests". The management of wildlife and also dealing with conflict situation has become a herculean task.

In order to control damages caused by elephants and confine the elephants within the Reserved Forests in Hosur Forest Division, the Forest Department have taken various preventive and mitigation measures like Elephant Proof Trenches, Solar Fence, Stone wall fence, Steel wire rope fence, Solar powered steel wire rope fence and Hanging solar fence and engagement of Anti-Poaching Watchers for elephant driving. Forest department have constructed several artificial waterholes, Check dams, Percolation Ponds to provide water facilities to animals inside forest with solar power energized system. All across the lands where elephants raid crops, hundreds of poor farmers spend the nights guarding over crops at the harvest time.

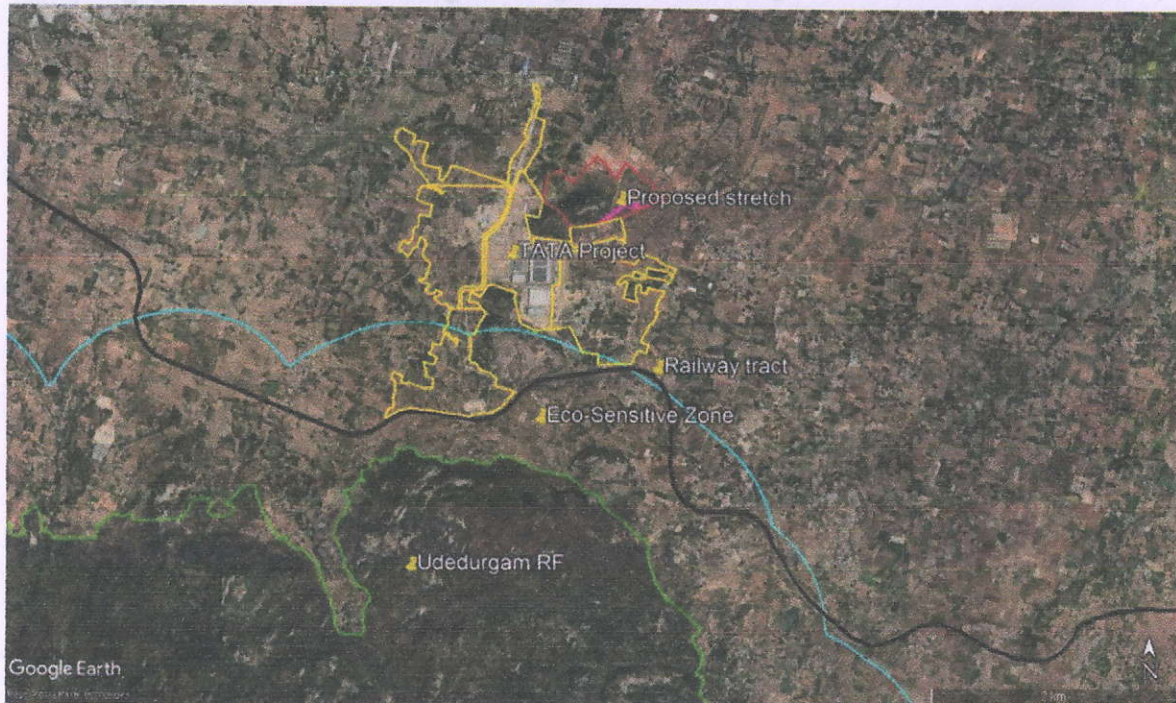
Train hit:

In a painful incident of 5 Elephants died due to train hit on Kelamangalam-Rayakottai track during March 2003 in Hosur Forest Division. Again, death of 2 Elephants due to train hit took place in this division on 04-02-2013.

Train hit during 2013



Map showing the proposed site, TATA Electronic Company and the boundary of Udedurgam RF (Cauvery North Wildlife Sanctuary)



Movement of elephants near the proposed site



Road accidents:

From 2015, Elephants were involved in 4 road accidents on the busy National Highway (NH-7). A calf was killed in a collision involving a small car. The adults blocked the road and are said to have trampled the small car. The driver escaped unhurt. In the second incident, a bus swerved to avoid an elephant near Sanamavu RF and jumped the median onto oncoming traffic. The driver and a few passengers were injured. In the third incident, a tusker collided with a bus near Krishnagiri and broke a tusk. The injured tusker has still not returned on reverse migration and is thought to have lost the confidence to cross the highway. It has since killed three persons till date at the time of this writing.

- On 03-02-2015 one elephant calf was hit by a car and died near Dakshina Thirupathi temple on NH-7.
- On 20-01-2016 one male elephant got injured while trying to cross NH-7 near Krishnagiri Collectorate. It had moved halfway but could not cross the centre barricade and tried to move back during which it was hit by a speeding bus.
- On 04-07-2016 one Mahna elephant got injured while trying to cross NH-7.
- On 15-01-2021, one Male elephant was died while trying to cross NH-7 in Sanamavu RF.

Elephants crossing NH-7 at Shoolagiri



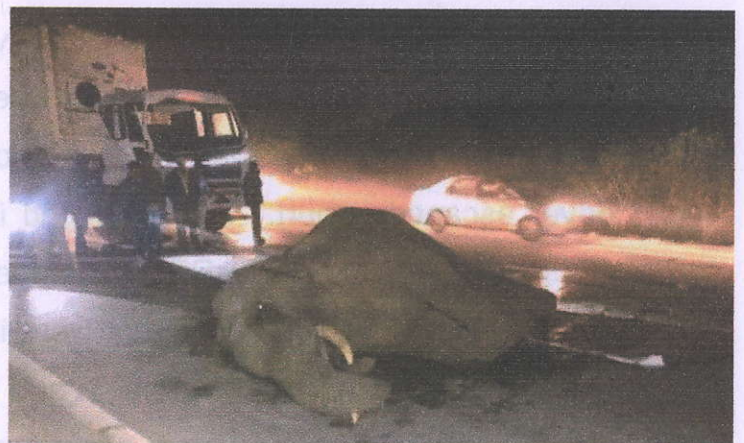
Elephants crossing the State Highway at Sanamavu RF



Road accident near Sanamavu RF on 04-07-2016



Road accident at Sanamavu RF on 15-01-2021



Proposal under Forest (Conservation) Act 1980:

A proposal for the erection 110KV Transmission line from Rayakottai - Kelamangalam Road to TATA Electronics Company passing through S.F.Nos. 954-956, 959-965, 970-972, 977 & 978 (Part-1) (0.21.12), (Part-2) (0.11.44) (Part-3) (0.66.00) to an extent of 0.9856ha of Ayaranapalli Panchayat, Shoolagiri Taluk, Krishnagiri District has been uploaded by the User Agency i.e. the Executive Engineer, TLC / TANTRANSCO, Dharmapuri through online. As per Revenue Record, the proposed site is classified as "Un-assessed Waste - Vanasaragam" land which defined as "Forest".

The Wildlife Warden, Hosur has inspected the proposed site with the Forest Range Officer and the staff of Rayakottai Range on 02-09-2022.

Wildlife Mitigation Measures Plan:

The seasonal movement of elephants from adjoining Bannerghatta and Cauvery Wildlife Sanctuary of Karnataka through the contiguous forest patch of Thally, Jawalagiri of Hosur Forest Division and then move to Reserved Forests like Noganur, Denkanikottai, Udedurgam, Sanamavu, Shoolagiri, Melumalai and Maharajagadai Reserve Forests of Hosur Division. The movement season is from *October – April* every year. During this season, herds of 40-70 Elephants are come out from the Reserved Forests.

The proposed site is located about 2.10km away from Udedurgam RF, which is part of Cauvery North Wildlife Sanctuary. The elephants migrated out from the Reserved Forests of Udedurgam RF and move to Sanamavu RF for crop raid by crossing many villages / hamlets in this area. A railway line is also running at nearly 2.00km distance from the proposed site towards the direction of RF. Train accidents in the past have happened in this stretch which led to death of seven elephants. The elephants which move from Udedurgam RF to Sanamavu RF are also impacted by National Highways (NH-44). Hence, to contain elephants within the contiguous forest areas, a Wildlife Mitigation Plan at a cost of Rs. 7.65 Crore is prepared to upload in the PARIVESH online web portal.

The same proposal has been submitted to the Principal Chief Conservator of Forests and Chief Wildlife Warden, Chennai for the approval.

PROPOSED WILDLIFE MITIGATION PLAN

Sl. No.	Details of proposed works	Qty.	Rate (Rs. in lakhs)	Per	Amount (Rs. in lakhs)
1.	Erection of Steel wire rope fence	10.00 km	50.00	km	500.00
2.	Clearing of Invasive alien species				
i)	1st year clearance of invasive alien species cleared area.	50.00 ha	0.4758	ha	23.79
ii)	2nd year maintenance for invasive alien species cleared area.	50.00 ha	0.357	ha	17.84
iii)	3rd year maintenance for invasive alien species cleared area.	50.00 ha	0.230	ha	11.51
3.	Construction of water troughs with bore-well and solar powered motor	5 No.	20.00	Nos.	100.00
4.	De-silting of existing waterholes	10 No.	4.00	Nos.	40.00
5.	Contingencies for unforeseen expenditures.	LS		LS	1.86
Total cost for the year 2022-2023					695.00
Add 10 % extra cost escalation for 2023-2024					69.50
Grand total					765.00

Detailed justification for the proposed works:

1. Erection of Steel wire rope fence

In order to minimize man – animal conflict, avoid human death, reduce crop damages, creation of advanced barricades in the form of Steel Wire Rope Fence with RCC structure would be more effective and would reduce the maintenance costs unlike the Elephant Proof Trenches, which gets silted over the year time. This wire rope fencing is largely maintenance free and cost effective. This is a new innovative method being devised for implementation. This fence will be erected in the most vulnerable points where elephants are frequently coming out and thus, will be effective in reducing the human-animal conflict.

The steel wire rope fence is based on the successful fence developed at Addo Elephant National Park of South Africa. The Addo fence made use of discarded tram rails for vertical fence post and discarded elevator cables for wire rope.

The Steel Wire Rope fence has been designed work as a physical barrier capable of withstanding the physical strength of elephants. By contrast, psychological barriers are dependent on unreliable factors such as solar power and the assumption that elephants can be deceived all the time.

The Steel Wire Rope fence erected in Hosur forest division was designed starting from a clean slate. Various prototype components were prepared and tested using Kumki elephants at Theppakadu elephant camp in Mudumalai Tiger Reserve. These experiments provided starting figures of elephant force capacity to help in the design process.

The field trial was conducted in Jawalagiri range of Hosur forest division in the wild and the fence performance was monitored with the help of camera traps. The shortcomings in the design were then overcome by making incremental changes which were again tested against wild elephants. The fence can be further improved by incorporating a solar hanging fence into it to discourage elephants from touching the fence.

An effective elephant proof barrier has now evolved after nearly 3 years of continuous improvements. This fence uses Precast RCC posts and galvanized steel wire rope and eucalyptus spacers to create a versatile, maintenance free, physical barrier that is completely Elephant Proof.

The Steel wire rope fence with precast reinforced concrete pillar has been erected under Tamil Nadu Innovation Initiatives (TANII) Scheme for a length of 10km along the boundary of Jawalagiri and Thally Reserved Forests in Cauvery North Wildlife Sanctuary during 2018-2019. Jawalagiri Range experiences very high HEC due to migratory elephants from Bannerghatta National Park in Karnataka. Hence this range was chosen for erection of the experimental Steel Wire Rope fence. The fence was erected along the most vulnerable villages along the forest boundary.

Due to the erection of these barriers, resulted gradually decreasing in the crop damages in the Ranges of Hosur and Rayakottai caused by elephants.

Comparative analysis of Crop Damage

Name of Range	Before fencing			After fencing		
	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Hosur	415	300	387	274	130	53
Rayakottai	16	165	2	0	0	22

Steel Wire Rope Fence erected along the boundary of Jawalagiri RF



The Additional Principal Chief Conservator of Forests and Chief Wildlife Warden has inspected the Steel Wire Rope Fence in Jawalagiri RF



The Additional Principal Chief Conservator of Forests (Wildlife) has inspected the Steel Wire Rope Fence in Jawalagiri RF



Proposed Stretches in the Udedurgam RF:

The total length of Udedurgam RF is 44km, in which, the proposed vulnerable stretch for the erection of Steel Wire Rope Fence is 10.00km.

2. Maintenance for Steel wire rope fence for 3 years:

The wire rope fencing is largely maintenance free and cost effective. However, it requires clearance along the fence, maintenance of path and eucalyptus spacers etc.

3. Clearing of Invasive Alien Species

Alien species such as Lantana camera, Chromolaena, Parthenium hysterophorus, Eupatorium adenophorum and Prosopis juliflora are one of the anthropogenic mediated ecological perturbations threatening forest and its biodiversity. Besides impacting ecosystem services, these invasive plant species are preventing natural ecological succession and changing the community structure and composition.

Among the invasive species, Lantana infestation is very high and is seen occupied throughout the division area and has become the greatest threat to the survival of wildlife. The species is spreading at an accelerating rate and hence control and eradication of Lantana would be a top priority. Presence of lantana

infestation restricts the growth of grass species, which serves as nearly 60% of feed source of elephants. Population of native browser species which constitute the rest 40% of diet of elephant is also declining due to invasive nature of lantana. Several efforts were made to remove this species from the forest and they are uprooted in order to overcome their reoccurrence.

The method of removal will be uprooting using site-specific tools and equipment. Appropriate mechanization, protective equipment and tools such as long handled shears, uprooting jacks, crow bars, topical tick and mite repellents, etc., shall be provided to persons employed in removal of Lantana.

Special care will be taken around perching trees and water channels to ensure that fresh sprouts from seeds dispersed by perching birds and water are removed in the cleared area.

Removal of exotic as well as indigenous weeds will reduce the competition and assist the growth of fodder species. Broadcasting of seeds of desirable species will supplement naturally growing fodder grass. Thus enhancing the fodder availability to retain the wild animals inside the Reserved Forest to avoid road accidents, crop damages, Property damages, human casualties, etc.

4. Construction of water troughs with bore-well and solar powered motor

During dry season and drought years, the animals experience the situation of lack of water within cruising distance and start straying into human habitations. It is highly essential to provide water to wild animals during dry season within the limits of their cruising ability, by formation of troughs, external filling of water to the troughs, installation of solar power based bore-wells with water troughs. Ground water may be pumped up and stored in the trough in interior forest areas by using solar pumps for providing water facilities to wildlife.

Proposed for provide drinking water facilities to the wild animals for construction of one water trough with bore-well at a cost a cost of Rs.15 Lakhs / each.

Construction of Water trough with bore-well in Tholuvabetta RF of Denkanikottai Range



5. De-silting of existing waterholes

The number of waterholes currently present are inadequate and not well distributed to the requirement of the area and movement of the wild animals. Most of them get silted during rainfall due to erosion creating scarcity of water especially during summer. Therefore, it is necessary to de-silt in a faced manner from time to time before the monsoon sets and there is a need for creating more waterholes in the sanctuary.

Construction of check dam reduces runoff velocity reducing soil erosion and gulying in the channel and allows sediments to settle out. Check dam will be constructed on the basis of watershed map of the sanctuary area.

Construction and strengthening of waterhole will help in improving the percolation of water under ground and hence increasing the water availability in the area and thus help fodder species in surrounding to regenerate. This will also aid in the avoiding the soil erosion and soil loss.

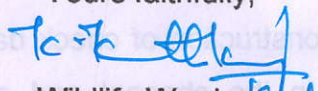
There are many water bodies constructed before 10 - 20 years inside Reserve Forest areas. Now most of them are highly damaged and silted due to rain, flood.

Most of them are get silted up creating scarcity of water during summer. Therefore, it requires immediate repair for storage of water. To overcome shortage of water inside forest areas, more number of water bodies like large percolation ponds and check dams constructed inside Reserve Forest areas of existing water bodies are being de-silted and deepening done to increase the water storage capacity and for providing water facilities to the wild animal during pinch period.

De-silting of waterholes



Yours faithfully,


Wildlife Warden,
Hosur Forest Division,
Hosur.



19/09/2022

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Rs. in Lakhs

Sl. No.	Details of proposed works	Qty.	Rate	Per	Amount	Justification
1	Erection of Steel wire rope fence	10.00	50.00	km	500.00	For control the elephants within the contiguous forest areas and to minimize man - animal conflict.
2	Cleaning of Invasive alien species					
i)	1st year clearance of invasive alien species cleared area.	50.00	0.4758	ha	23.79	Removal of exotic as well as indigenous weeds will reduce the competition and assist the growth of fodder species. Broadcasting of seeds of desirable species will supplement naturally growing fodder grass. Thus enhancing the fodder availability to retain the wild animals inside the Reserved Forest to avoid road accidents, crop damages, Property damages, human casualties, etc.
ii)	2nd year maintenance for invasive alien species cleared area.	50.00	0.357	ha	17.84	
iii)	3rd year maintenance for invasive alien species cleared area.	50.00	0.230	ha	11.51	
3	Construction of water troughs with bore-well and solar powered motor	5	20.00	Nos.	100.00	Provide drinking water facilities to the wild animals for construction of 5 No. of water troughs with bore-well at a cost of Rs. 20 Lakhs / No. as per the guidance of the Forest Officials for the conservation of wildlife and forest.
4	Desilting of existing waterholes	10	4.00	Nos.	40.00	Water harvesting structures will serve as vital source of drinking water to wildlife, reduce surface run-off and imbound water, reduction of soil erosion.
5	Contingencies for unforeseen expenditures and variation in rates.	LS		LS	1.86	To meet the unexpected expenditure.
Total					695.00	
add 10 % escalation for 2023-2024					69.50	
Grand total					765.00	

Wildlife Warden
Hosur Forest Division,
Hosur.

19/09/2022