



Human-Elephant Conflict Mitigation & Infrastructure Audit

Thithimathi – Nagarahole Range – Karmad – Kushalnagar Corridor

Submitted By: Coorg Wildlife Society (CWS)

To: Forest Department, Karnataka & MoEFCC | September 8 , 2026



Executive Summary: The Landscape Crisis

The Landscape Context

High-Density Contact Zone:

One of South India's highest-pressure human-elephant interfaces.

Traditional, interconnected forest pathways have been heavily disrupted. Research shows that Kodagu's critical dry deciduous forest cover—the primary sanctuary for elephants—**declined by 46% over a 20-year span**. Natural grass cover has also been drastically reduced by historic droughts and forest fires, making way for unpalatable, invasive species like *Lantana camara* and *senna*.

The Landscape Context

- **Mega-Infrastructure and Linear Barriers**

The implementation of linear infrastructure projects, including high-voltage power lines, expanded highways, rail proposals, and structures like the Kabini & Harangi Dams, have completely choked seasonal migration corridors.

- **Encroachment**

The change of natural spaces over a period of time into cultivated areas and tribal colonies has blurred the boundaries between the forest and farm. Elephants are highly migratory animals that travel hundreds of kilometres. When their migratory routes are blocked by farms, interaction with humans becomes inevitable.

- **Adaptation Alterations ("Estate-Bred Elephants")**

In a dramatic behavioural shift, some elephant herds have completely stopped returning to the government reserves. Labelled "**estate-bred elephants**", these animals permanently eat, rest, and breed entirely within private / neglected coffee estates, & Devaracadus bringing them into daily contact with plantation labourers.

- **Degradation of existing forests**

The lack of bamboo, extensive teak monoculture & reduction in water holding capacity of tanks within the forests due to siltation along-with large scale invasive species – lantana, senna spectabilis, parthenium, that cover large swathes of the forest floor, has led to sustained lack of fodder in the undergrowth. Additionally, the development within the forest areas with Tribal projects – housing, electrification, road access to these areas, has led to additional disturbance to wildlife within these areas.



Elephant herds within coffee estates



Elephant activity in the Chetthalli Horticulture Farm and Coffee Research Station



Key Observations

- **Seamless Corridors**

Fragmented forests, coffee plantations, and seasonal crops – jackfruit / banana / mango draw herds directly into human habitations.

- **Systemic Failures**

Discontinuous execution of physical barriers creates structural 'funnel traps'.

- **Teak Monoculture**

The large-scale prevalence of teak monoculture within our forests, has led to significant ecological damage, soil erosion & decrease in foliage, this has led to a lack of fodder for the elephants.

- **Silted Trenches**

Monsoonal runoffs completely neutralize Elephant Proof Trenches (EPTs).

- **Un-serviced Fences**

Lack of service / maintenance of on-ground solar/tentacle electrical networks.

- **Targeted Action Needed**

Differentiating management for social family groups vs. persistent solitary bulls.



Broken Rail barricades – Baradi / Nanjarayapatna

Geographic Hotspots & Conflict Drivers

Sector / Range	Landscape Characteristics	Primary Threat & Conflict Drivers – Funnel Traps
Thithimathi Range: Marapala – / Chinni Hadlu - K M Kolli (Ponnapsanthe / Devanur) Laxmanthirtha / Ganaguru Division – Thithimathi Range	Complex coffee estate-forest matrix, heavy commuter traffic, dense undergrowth, human settlements on the fringes.	Herds taking refuge in coffee plantations during daylight; high risk of surprise encounters for estate workers. Some of the primary funnelling routes are mentioned below: Route 1: Elephants migrate from Airyasulli into Marapala, passing directly through the vulnerable hamlets of Ganaguru, Laxmanheertha, and the Sulgodu Beat. Route 2: Direct infiltration from K.M. Kolli to Chenni Hadlu – the largest breach is near the tribal colony of 450 acres, with the Forest Dept being prevented by the tribals from installing rail barricades and EPT, thereby creating a funnel through which the elephants move into cultivated areas – Nokya / Ponnapsanthe / Devanuru Route 3: Movement tracking through Thithimati – Kunjraman Katte – Janagala Hadi to Marapala. Gaps along this route are excessively wide due to completely shattered barricades. River Crossing – There is a marked area of 200 mts on the Laxmantheertha river which requires a special structure consisting of reinforced cement poles as this is embedded in the riverbed, to prevent elephants from using this vulnerable spot to exit the reserve
Nagarahole Fringe: Kalhala / Karmad / Gonigedde / Balacove Range gaps	Protected forest core directly bordering agricultural settlements and tribal hamlets.	Territorial pressure from core forests; seasonal movement of tuskers, matriarch herds and Makhanas across perimeter lines. Route 1: Critical systemic vulnerabilities and barrier compromises are concentrated in Bomana Haddi / Gonigadde section / Hulikal Camp / Lakkunda / Chaine hadlu / Kidangi Thodu / Ramanna Kolli Route 2: High-priority mitigation zones include Brahmagiri Colony, Tatekere Hadi, & Kolli Hadi

Geographic Hotspots & Conflict Drivers

Sector / Range	Landscape Characteristics	Primary Threat & Conflict Drivers – Funnel Traps
Maldare Sector - Chenankote	Fragmented buffer zones, patchy canopy, active farmland interface, human settlements on the fringes	Broken physical barriers allowing easy herd infiltration; severe and recurring crop damage (paddy/plantain). A catastrophic fence breach exists where Early Elephant Detection Systems (EPDs) have failed, granting herds unhindered entry into human settlements. Shilpi Estate (Ex-BBTC / Elkhill): Functions as an active, high-traffic transit corridor between forest boundaries and private commercial plantations. The complete absence of physical barriers allows herds to cross seamlessly into agricultural sectors
Kushalnagar / Dubare / Anekad / Maldare Belt	High human density, tourist hubs (Dubare vicinity), riverine crossings.	River bed navigation by elephants; intense spatial pressure at fringe village borders and resort boundaries. High-priority mitigation zones include Anekad, Dubare, Valnoor, & Maldare
Brahamagiri – Parakatgiri / Birunani / Theralu / Kuruchi / Irupu Falls - Brahmagiri Wildlife Sanctuary	Protected forest core directly bordering agricultural settlements	Unserviced / damaged solar fence lines, a total lack of rail barricades and EPT that have not been desilted & repaired over an extended period of time.

Geographic Hotspots & Conflict Drivers

Key elephant corridors connecting the Kodagu (Coorg) landscape to surrounding forest ecosystems in Karnataka and Kerala include:

- **Nagarahole / Brahmagiri / Wayanad Corridor:** Facilitates inter-state transit between Kerala's Wayanad Wildlife Sanctuary at Thopetty and Karnataka's Brahmagiri and Nagarhole landscapes, leading up-to Kabini
- **Dubare – Nagarhole (Tri-Junction) Link:** Connects the Dubare Reserve Forest / Central Kodagu landscape to the northern reaches of Nagarhole National Park bridging fragmented coffee estate patches with contiguous forest reserve. This area is completely fragmented and blocked with intense human activity – resorts, hotels, large residential plots. Farming.
- **Anekad – Pushpagiri Corridor:** Connects the Anekad Reserve Forest with Pushpagiri Wildlife Sanctuary – connecting the Kukke Subramanya area and Bisle Ghat. This corridor allows elephant herds to move between the higher elevations of the Western Ghats and the lower deciduous forests of Dubare / Maldare / Nagarhole.

Physical Barrier Audit: Critical Gaps

Barrier Type	Field Status / Efficacy	Critical Structural Flaws Identified
Rail Barricades	Most effective against adult tuskers	Discontinuous Execution: Isolated 2-5 km stretches left un-joined create severe funneling effects into neighboring unprotected farms. Meenukolli – 13.7 km; Anekadu – 8.3 km; Attur – 5.8 km. A 15KM Rail Barricade is urgently required - Nagrahole, Kahalla Division A critical gap exists at Aiyarsulli / K M Kolli / Marapala tribal hamlets (450 acres – 6 km) Total lack of barricades: - Balecove section leading into Begur section & Wayanad – JP Kandi 40mts; Ganesh Kattada 150 mts; Ponnanna Hadlu 50 mts; Sunbramani Kere 100 mts. Goni Gadde Section – Hulikal Camp 17 km; Lakkunda 1 km;
Elephant Proof Trenches (EPT)	Moderately effective in dry seasons	Siltation & Soil Erosion: Monsoonal runoff fills trenches. Elephants easily breach them by kicking down sidewalls. Attur – 6.2km; Maldare – 7.6 km; Anekadu – 11.1 km; Meenukolli – 16.7 km.
Solar / Tentacle Fences	Low-cost, fast deployment deterrent	Maintenance Failures: Overgrown vegetative grounding, fallen branches, and power cuts leave prolonged zero-voltage entry windows. Meenukolli – 23.8 km; Anekadu – 7.3 km; Attur – 6 km.

Physical Barrier Audit: Critical Gaps



Aiyarasulli / K M Kolli
broken barricades -



Laxmantheertha rivercrossing breach- Ganagur beat , Thitimathi
Range



Kollihadi / Karmad Tribal Colony Opening - NTR

The Legal and Policy Tug-of-War

A core operational paradox deadlocks field mitigation - continuous containment boundaries break down where local communities sit directly inside peripheral buffer zones. Bypassing tribal hamlets to respect land rights leaves open gaps that act as spillways for wild herds.

The executive body remains trapped between contradictory statutory mandates.

The Wildlife Protection Act (1972) & Forest Conservation Act (1980): Mandate strict, continuous ecological demarcation and inviolate wildlife spaces.

The Forest Rights Act (FRA, 2006) & PESA Act: Guarantee ancestral land and habitation rights, protecting indigenous communities from non-consensual enclosure or displacement.

Enforcing physical lines without Gram Sabha approval triggers legal injunctions, while leaving gaps open leads to human casualties and retaliatory elephant electrocutions.



CWS Action Plan & Differentiated Strategy

CONFLICT INCIDENT



FAMILY HERDS

- Soft-release to interior forest
- Active GPS satellite collaring
- Non-aggressive driving (No firecrackers)
- Real-time geofence tracking



HABITUAL BULLS

- Three-Strike rule evaluation
- High-security 50-100 ha enclosure
- Specialized satellite telemetry
- Training as Kumki assets

Current Mitigation Measures & Fatal Flaws

The Forest Department and local groups like the Coorg Wildlife Society (CWS) have utilized several defensive strategies, though structural execution remains a point of friction:

Mitigation Method	Operational Function	Key Limitations / Flaws
Solar Fencing	Delivers a mild, non-lethal electrical jolt to deter elephant entry into estates.	High maintenance requirements; smart elephants frequently break them using logs.
Rapid Response Teams (RRT)	Specialized forest personnel deployed to herd wild animals back into the woods.	Stretched resources; dangerous tracking conditions in dense, private coffee brush.
SMS Early Warning Alerts	Putting radio-collars on matriarch cows to track herds via a mobile app.	Ineffective for uncollared solitary bulls; dependent on local cellular connectivity.
Compensations	Monetary payouts provided by the Regional Forest Office for injuries or crop loss.	Long processing times, administrative delays, and payouts that do not cover true market value.

Pillar I: Infrastructure Overhaul

Continuous Line Fortification: Transition to gap-free railway track barricades embedded in heavy concrete footings. Stream crossings must utilize suspended heavy steel pendulum grates that allow monsoon water flow but block elephant movement.

Hybrid Layouts: Pair deep, bi-annually desilted EPTs with hanging solar tentacle fences offset by 3 meters to prevent elephants from reaching trench edges.

Priority Maldare- Valnoor Action: Execute immediate cable re-installation, energizer repairs, and automated gate enforcement at the Chain Gate colony entry.

Pillar II: Tiered Elephant Management Strategy

Family Herds & Matriarchs: Must be steered via passive driving (strictly avoiding firecrackers to prevent calf separation). Soft-release them into deep core forest zones fitted with active GPS satellite collars.

Habitual Rogue Bulls & Makhanas: Implement a strict "**Three-Strike Rule**". Persistent village intrusion or unprovoked aggression triggers satellite telemetry collaring and relocation.

Specialized Holding Facility: Establish a high-security, 50-to-100 hectare holding enclosure equipped with reinforced rail fencing, natural water bodies, and forage for isolation and veterinary behavioral assessment. Persistent recidivist bulls will be trained at established camps (Dubare, Mattigodu) to become **Kumki assets** for future driving operations.



Open Chain Gate at Maldare leading to a tribal hamlet

Shilpi /Fayaz Estate barricade breach



Pillar III: Socio-Economic Resolutions

Voluntary Relocation Programs (VLR): Provide transparent, generous financial compensation and alternative arable land packages outside reserve limits under NTCA guidelines to establish clear, inviolate corridors.

Early Warning Sensor Networks: Deploy automated SMS and WhatsApp broadcast networks powered by smart solar line-break sensors, seismic ground tools, and night-vision drone units to alert estate managers and local residents instantly.

Human Casualties

The conflict has become highly volatile. Kodagu ranks as one of the worst-affected districts for wildlife encounters in Karnataka, alongside Chamarajanagar. High-profile incidents—such as the recent deaths of a young woman named Pooja and a 56-year-old coffee planter named Mokalamada Rathu—have triggered widespread civil unrest and protests against the state.

Crop and Property Devastation

Farmers suffer severe financial stress due to regular crop raiding. An average farmer in conflict zones encounters multiple instances of animal damage, translating to severe annual economic losses. There is a huge delay in payment of compensation by the department. In affected areas where damage is moderate to heavy, compensation has been delayed and kept pending for many months/ years. This has led to a lot of frustration in the public domain and people hold the forest department accountable when it comes to compensation.

Multilayered Predator Threats

While elephants cause the highest percentage of property damage and human deaths, the conflict is intensified by frequent **leopard attack on livestock and tiger attacks** on humans and livestock, compounding the atmosphere of fear.

Out-Migration

Persistent crop losses and the underlying psychological toll have forced an estimated **15% of farming families to abandon their lands** and migrate to urban areas for alternative livelihoods.

Strategic Interventions: Infrastructure Overhaul

1. Continuous Line Fortification

- **Eliminate Piecemeal Construction:**

Transition immediately to uninterrupted barriers along high-risk zones.

- **Engineering Standard:**

Use reinforced steel rail joints embedded heavily in concrete footings.

- **Secure Junctions:**

Prevent breaches at vulnerable seasonal stream beds, culverts, and drainage points.

2. EPT Overhaul & Hybrid Systems

- **Mandatory Desilting Budget:**

Institutionalize fixed pre- and post-monsoon maintenance budgets for all 4 sectors.

- **The Hybrid Model Layout:**

Pair deep EPT trenches with suspended solar tentacle fences offset by 3 meters.

- **Prevent Dirt Bridges:**

Distance barrier prevents elephants from approaching trench edges to kick down walls.

Strategic Interventions: Technology & Community

3. Elephant Task Force Modernization

- **Advanced Gear:**

Equipping local ETF teams with all-weather vehicles and thermal night-vision.

- **Airborne Surveillance:**

Deploy long-range drone monitoring networks along dense forest perimeters.

- **Early Warning System:**

Automated real-time SMS & WhatsApp broadcast loops for plantation managers and local supervisors.

4. Fence Maintenance Collectives

- **Joint Committees:**

Establish joint Forest Department and Estate Owner maintenance teams under the JFPC.

. The lack of effective barricades around huam settlements in the fringes of the forest boundaries

- **Clear Demarcation:**

Assign precise legal and operational ownership over fence perimeters.

- **Systematic Clearing:**

Allocate dedicated monthly stipends for routine vegetation/undergrowth clearing along lines.

Targeted Bull Management Strategy

Note: Large 500-600 km² enclosed reserves present unviable ecological, financial, and legal constraints under the Wildlife Protection Act (1972). CWS proposes a legally sound, differentiated strategy instead.

Family Herds & Matriarchs

- **Immediate Soft-Release:**

Avoid prolonged holding or family separation near agricultural fringes.

- **Preserve Social Bonds:**

Release quickly into deep core forest zones.

- **GPS Satellite Collars:**

Active monitoring to track group movements and preserve herd integrity.

Dedicated Holding Enclosure

- **Scale & Security:**

50-100 Hectares equipped with reinforced rail and internal solar fencing.

- **Natural Ecosystems:**

Rich internal forage density paired with natural water bodies.

- **Target Cohort:**

Specialized transit/observation center for persistent crop-raiders and fence-breachers.

Kumki Capacity Building

- **Formal Evaluation:**

Irreversibly habituated bulls presentation ongoing life risks undergo camp screening.

- **Camp Integration:**

Practical training at established hubs including Dubare, Mattigodu, and Balle.

- **Operational Assets:**

Problem bulls become critical assets for future tracking and driving operations.

Strategic Recommendations for Co - Existence

To move past temporary stop-gap measures, the [Coorg Wildlife Society](#) and regional conservation teams emphasize treating the crisis on par with a **natural calamity**, utilizing the following institutional reforms:

Mandatory Eco-Sensitive Zones (ESA): Enforcing strict protection over remaining buffer spaces around the Western Ghats and limiting heavy infrastructure expansions (rail lines and commercial highways) through sensitive migratory zones.

Physical Boundary Barriers: Transitioning away from easily broken solar wires toward high-strength rail-barricades along national park boundaries to separate public land from wildlife zones.

Corridor Re-establishment: Government buy-backs of small, critical land patches inside blocked corridors to re-link fractured migratory pathways between Nagarhole and surrounding sanctuaries.

Aggressive Invasive Weed Clearance: Systematically clearing *Lantana camara* from protected state forests and replanting native grasses to naturally draw foraging elephants away from agricultural land.

Inter-Departmental Synchronization: Establishing seamless communications between the Revenue, Forest, Agriculture, and Electricity supply boards (such as CHESCOM) to immediately fix sagging power lines and expedite fair compensation timelines.