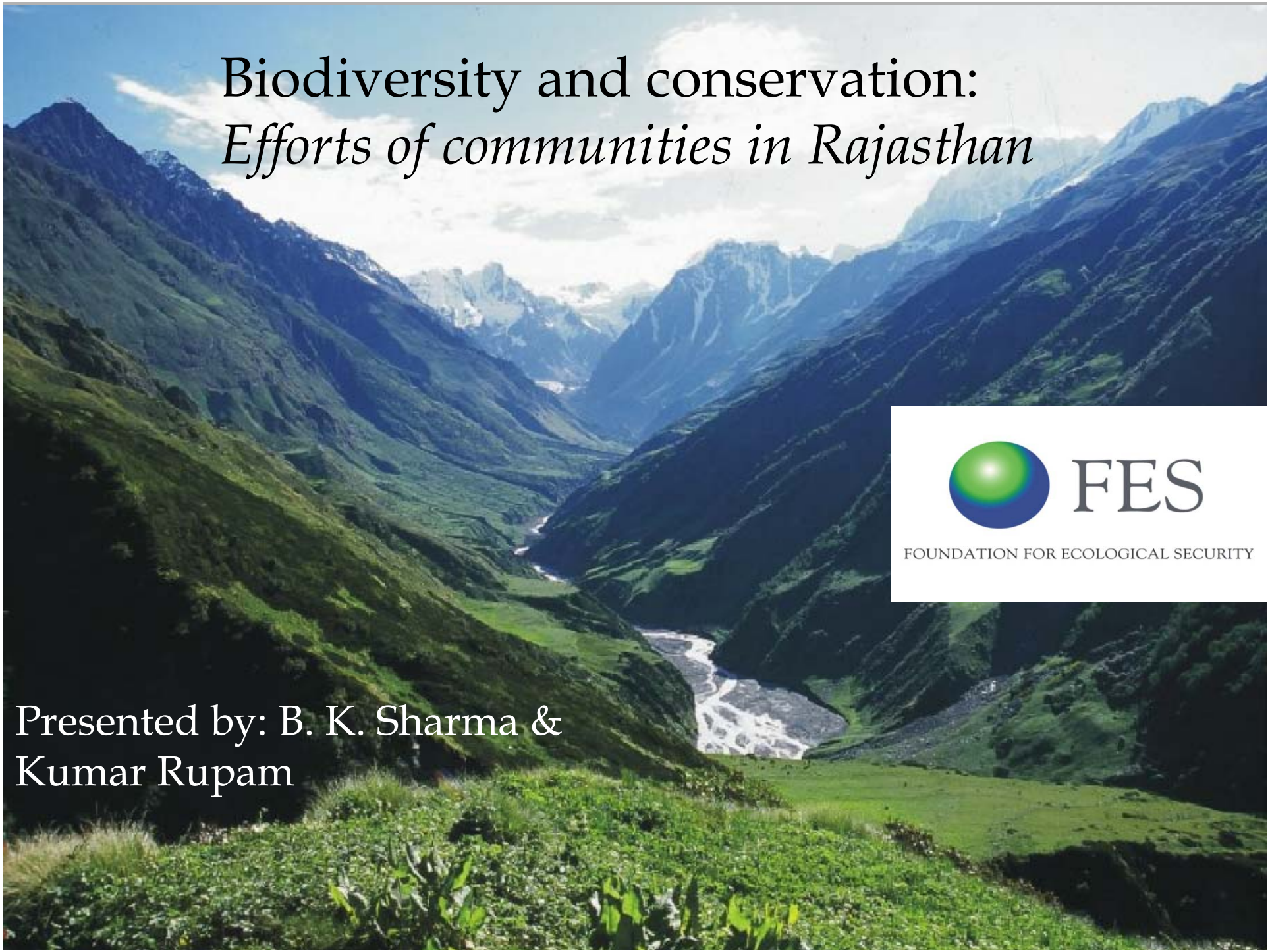
Biodiversity and conservation:
Efforts of communities in Rajasthan



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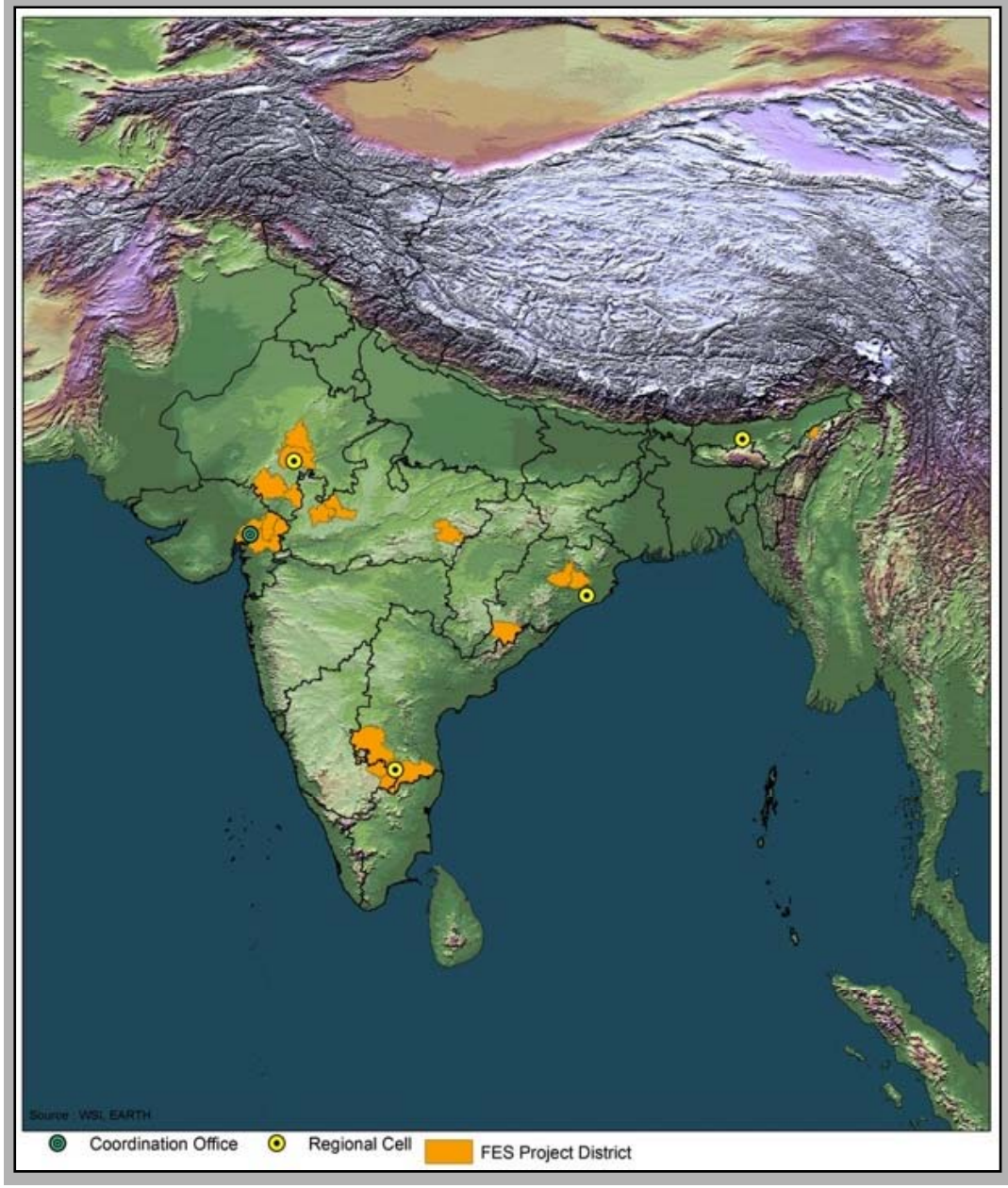
FOUNDATION FOR ECOLOGICAL SECURITY

Presented by: B. K. Sharma &
Kumar Rupam

Our Presence



We work;

in six eco-regions of the country

with 2998 village institutions

with 278 thousand rural families

about 162 thousand ha of commons and forest

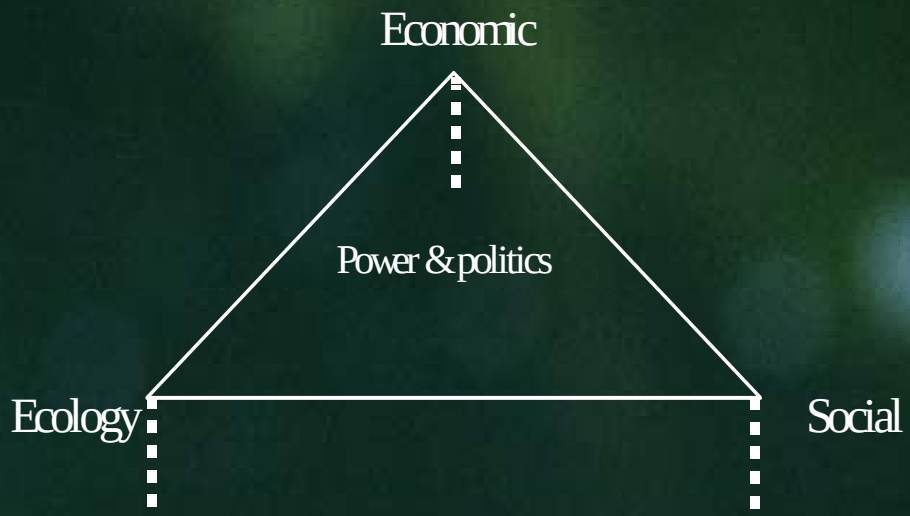
in 23 districts of seven states

focusing on processes through long-term presence in each location.

11 Field Teams, 4 Regional Offices, I RSO.

About 230 staff members

Our Leanings



- Ecological Security is the foundation for sustainable development
- Commons – as they are the physical, institutional and political spaces of the poor
- Conservation and poverty alleviation go hand in hand

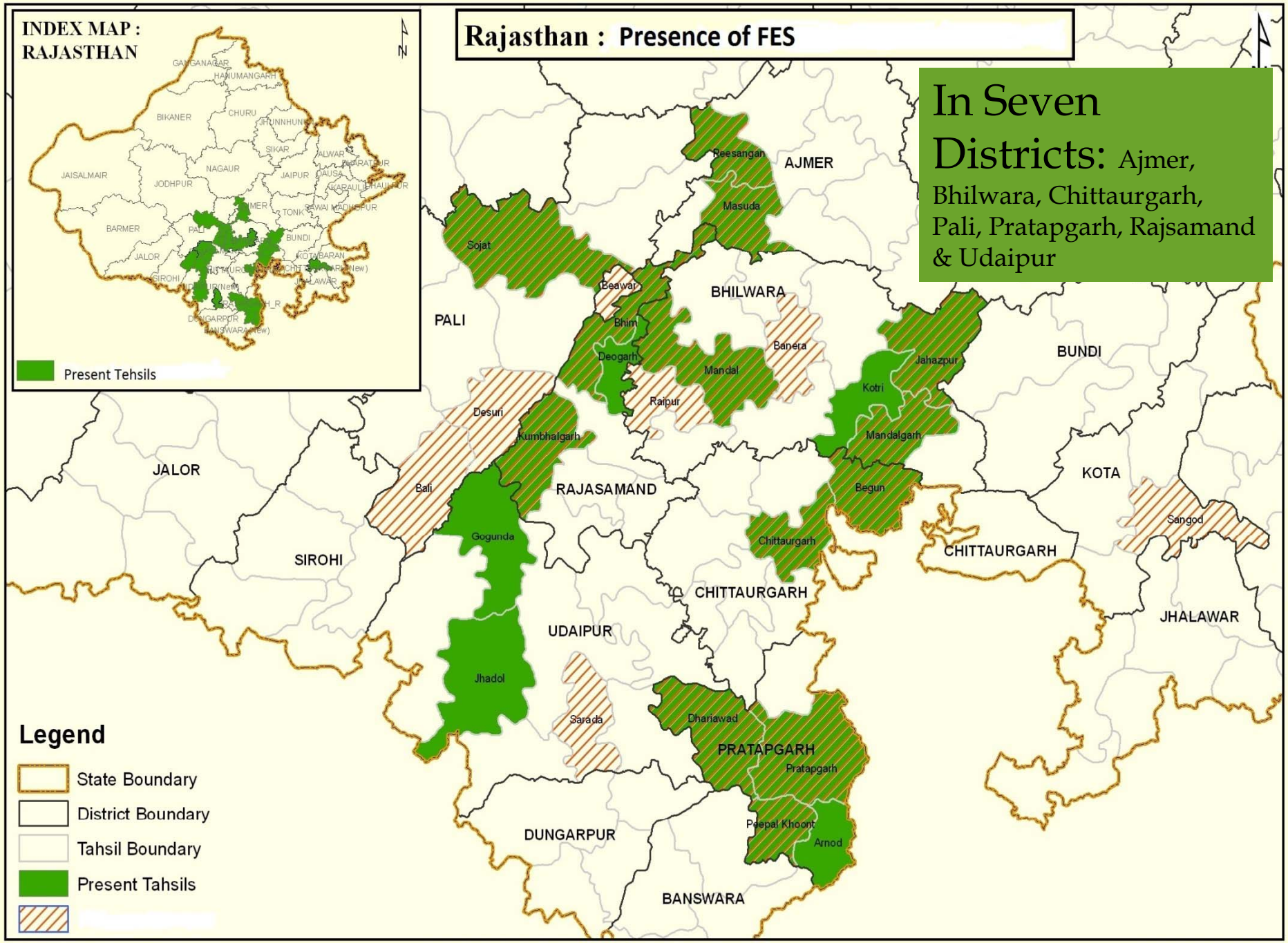
Basic tenets

- **Ecological Restoration** – work on strengthening hydrological, nutrient flows and biodiversity in forest and commons dominated landscapes.

- **Commons and community institution** – build on local community institutions, revive collective action and strengthen tenure arrangements over commons

- **Conservation and livelihood** – search for suitable alternatives to highlight practices and principles of natural resource based livelihoods that are ecologically sound and economically rewarding.

In Rajasthan


INDEX MAP :
RAJASTHAN
Present Tehsils
Rajasthan : Presence of FES
In Seven Districts: Ajmer, Bhilwara, Chittaurgarh, Pali, Pratapgarh, Rajsamand & Udaipur
Reesangan
Masuda
Sojat
Beawar
Bhim
Deogarh
Mandal
Banera
Raipur
Desuri
Kumbhalgarh
Bali
Gogunda
Jhadol
Sarada
Jahazpur
Kotri
Mandalgarh
Begun
Chittaurgarh
Sangod
Dhariawad
Pratapgarh
Peepal Khoont
Arnod
AJMER
BHILWARA
PALI
BUNDI
JALOR
SIROHI
RAJASAMAND
UDAIPUR
CHITTAURGARH
KOTA
JHALAWAR
DUNGARPUR
PRATAPGARH
BANSWARA
Legend
State Boundary
District Boundary
Tahsil Boundary
Present Tahsils

Rajasthan: At a glance

- Seven Districts: Ajmer, Bhilwara, Chittaurgarh, Pali, Pratapgarh, Rajsamand & Udaipur
- Around 33,328 ha of common land brought under community's governance
- Directly engaged with 780 habitations and 251 gram panchayats
- Around 358588 lives touched through various inteventions

Key issues

- Degradation of commons, forest and biodiversity loss
- Widespread poverty
- Weakened conservation-livelihoods linkages
- Increasing vulnerability due to climatic factors
- Governance of natural resources- at local level and policy environment


Our Engagement

Focus on commons

-Advocating for the importance of commons – *Regional , National and International level*
- Role in drafting commons policy for the Rajasthan
- Campaign for the commons
- Building capacities for the management of commons – *Prakriti Karyashala*

Work at Landscape

- Administrative boundaries often do not match ecological boundaries
- Strengthening inter-linkages of resources for sustainable livelihoods

Appropriate Institutional Arrangements and Linkages

- People led processes, Local self governance institutions
- Broad basing decision making and pro-poor.
- Strengthening collective action – commons
- Appropriate tenure arrangements

Efforts of the institutions

- Developing systems and mechanisms for managing natural resources
- Preparing participatory plans
- Mapping and developing common lands
- Outlining roles and responsibilities for every sections of the community

Building Capacities – *Prakriti Karyashala*

- Focus on strengthening local self governance of natural resources
- Identification , skill building and hand holding cadre of local para – workers to assist the village institutions
- Developing a cadre of rural volunteers for strengthening planning, implementation, monitoring, review of activities and Governance of resources
- Nurturing local stewardship through MAP, Federations and other regional forums

Ecological Restoration

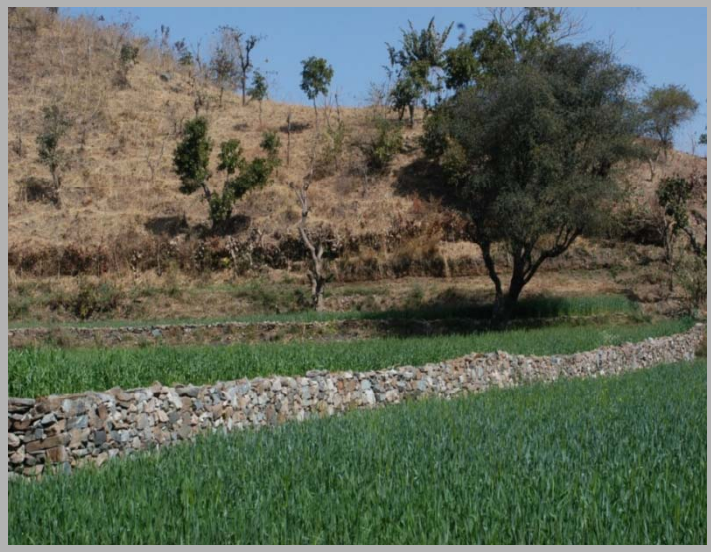
Interventions based on understanding of local conditions;
Ecological, Geo-hydrological, Social and Economical

Interventions aimed at improving:

- Hydrological regime
- Biomass and biodiversity
- Soil conservation and mineral cycles

Ecological Health Monitoring

- Geology and hydrology
- Soil nutrient monitoring.
- Eco-profiles, Baseline data on floral and faunal diversity
- Preparing Conservation Action Plans
- Regular collection of biomass data of enclosure plots, water table of selected wells, rainfall data, Crop data etc with the help of local Para workers



Strengthening conservation - livelihood linkages

- **A strong sense of belonging to their habitat**
- **Manage a complex landscape mosaic**
- **Building resilience for climate variability**

Energy Conservation

- Promotion of biogas
- Promotion of energy efficient and smokeless chulha
- Experimenting with solar cookers and lights

Assessment of Biodiversity in Kumbhalgarh, Phulwari-ki-Nal and Sitamata Wildlife Sanctuaries of Rajasthan – *A Conservation Perspective*

Foundation For Ecological Security (FES)
No.18, New Ahinsapuri,
Fatehpura, Udaipur,
Rajasthan.

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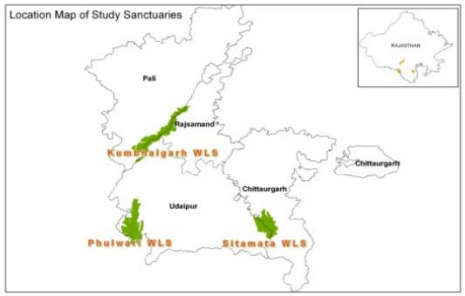
Area, Location & Ecological Significance



Details	KWLS	PWLS	SWLS
Area Km^2	610.53km^2 (600.18km^2 RF & 10.35km^2 PF)	511.41 km^2 (365.92 km^2 RF & 145.49 km^2 PF)	422.95 km^2 (359.60 km^2 RF & 63.35km^2 PF)
Location	Udaipur, Pali & Rajsamand	Udaipur	Udaipur, Pratapgarh & Chittorgarh
No.of Blocks	34 Forest Blocks	11 Forest Blocks	28 Forest Blocks
Ecological Significance	Ecotone - hill forests of Aravallis and Thar Desert located in the west	Forests contiguous - North Gujarat Region.	Inter junction of the Aravalli & Vindhyan hill ranges and Malva Plateau
	Barrier, checking the eastward extension of the desert	Largest viable forest tract among the fragmented forest belt of Rajasthan	Exhibits all habitats in the Aravalli hill ranges
	Western most limit of Teak forest	Western most limit of Teak forest	North-western limit of Teak-Bamboo forests and the fauna occurring there in

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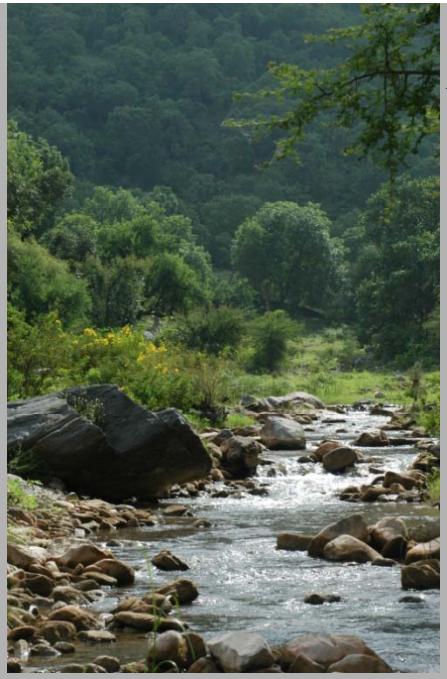
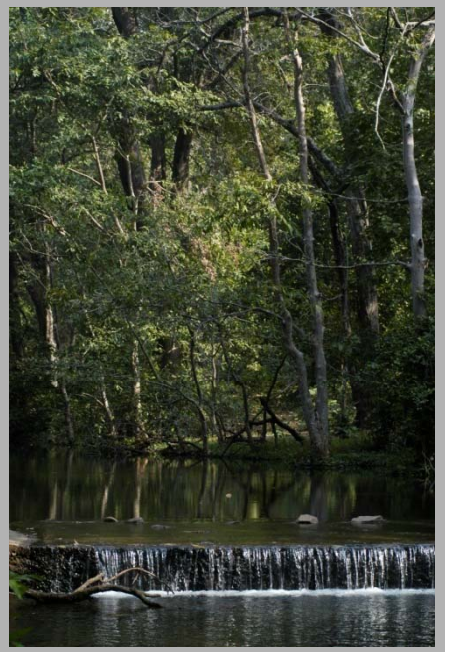
Biodiversity Value – Floral Species Richness

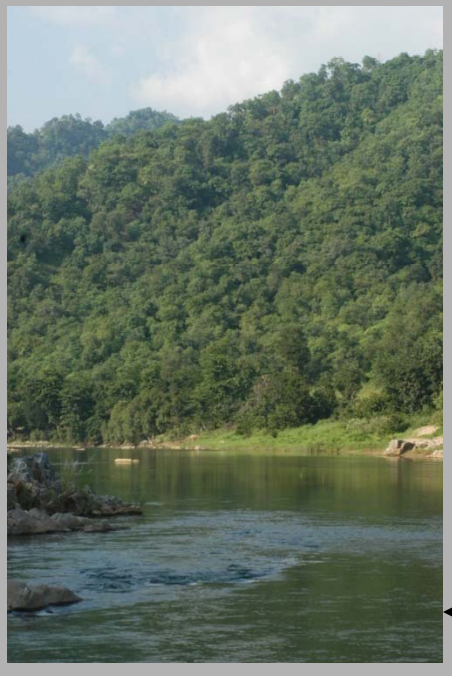
Groups		KWLS	PWLS	SWLS
Lower Plants	Pteridophytes	13	12	18
	Bryophytes	15	11	43
	Mushrooms	24	22	36
Higher Plants	Trees	120	113	128
	Shrubs	116	101	110
	Climbers	27	31	29
	Herbs	247	264	258
	Grasses	67	67	65
	Sedge	8	10	9
	Parasite	3	5	4
	Orchids	0	5	8
Total		640	641	708
Threatened Species		26	27	27



← Kumbhalgarh WLS

Sitamata WLS →





Phulwari-ki-Nal WLS ←

Biodiversity Value – Faunal Species Richness

Groups	KWLS	PWLS	SWLS
Butterflies	100	73	82
Spiders	12	9	18
Amphibians	12	13	14
Reptiles	38	35	35
Birds	258	214	282
Mammals	39	42	46
Total	469	386	477
Conservation Significance	16	10	16
Pollinators	105	80	77
Pest Controllers	110	93	96
Seed Dispersers	27	23	22


White browed Fantail


Grey Pansy


Burrowing Frog


Russel's Kukri


Sambar


Signature Spider

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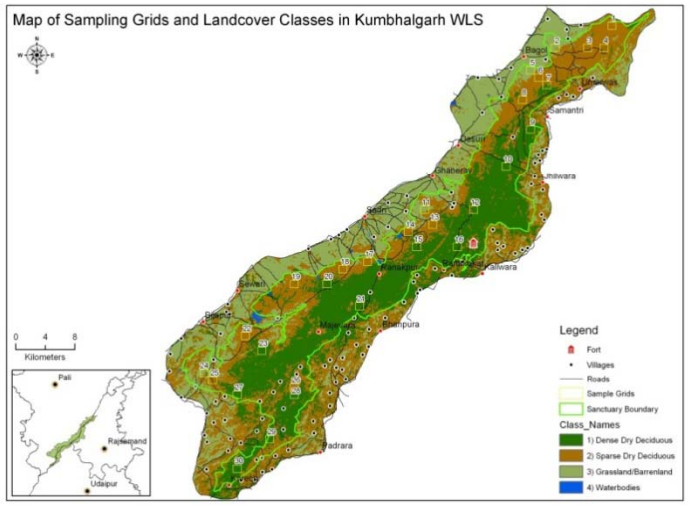
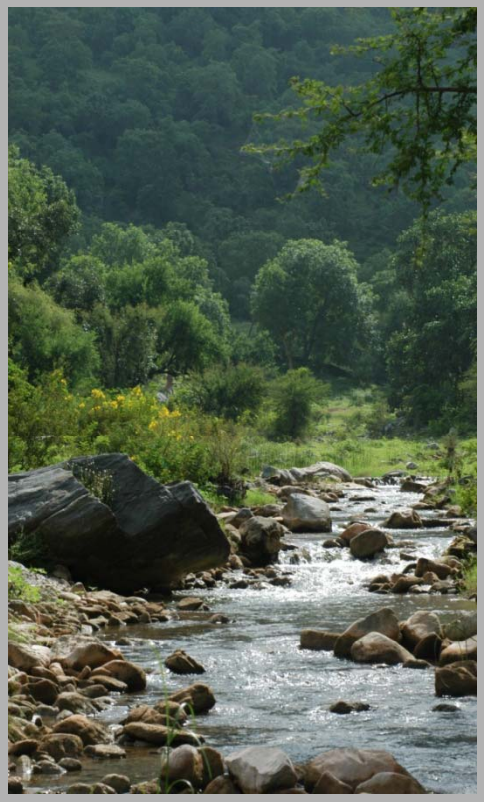
Floral & Faunal Richness In Different Vegetation Types of Kumbhalgarh WLS

Life Forms	No. of Species			
	Dry Deciduous		Moist Deciduous	Tropical Thorn
	DDDF	SDDF		
Tree	**71**	57	43	37
Shrub	**61**	39	28	**51**
Climber	23	7	10	6
Herb	**86**	80	74	**107**
Grass	**39**	27	15	36
Sedge	2	1	6	1
Parasite	2	2	0	0
Orchids	0	0	0	0
Butterflies	**26**	18	20	**39**
Amphibians	0	0	2	1
Reptiles	6	8	7	**15**
Birds	**71**	58	58	**121**
Mammals	**26**	22	20	**25**





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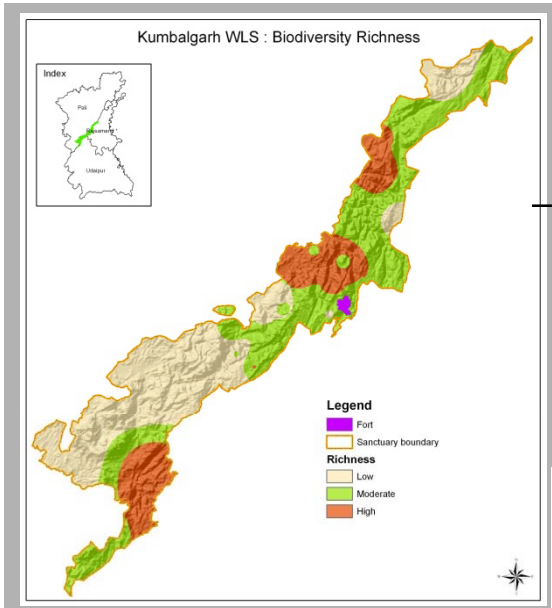
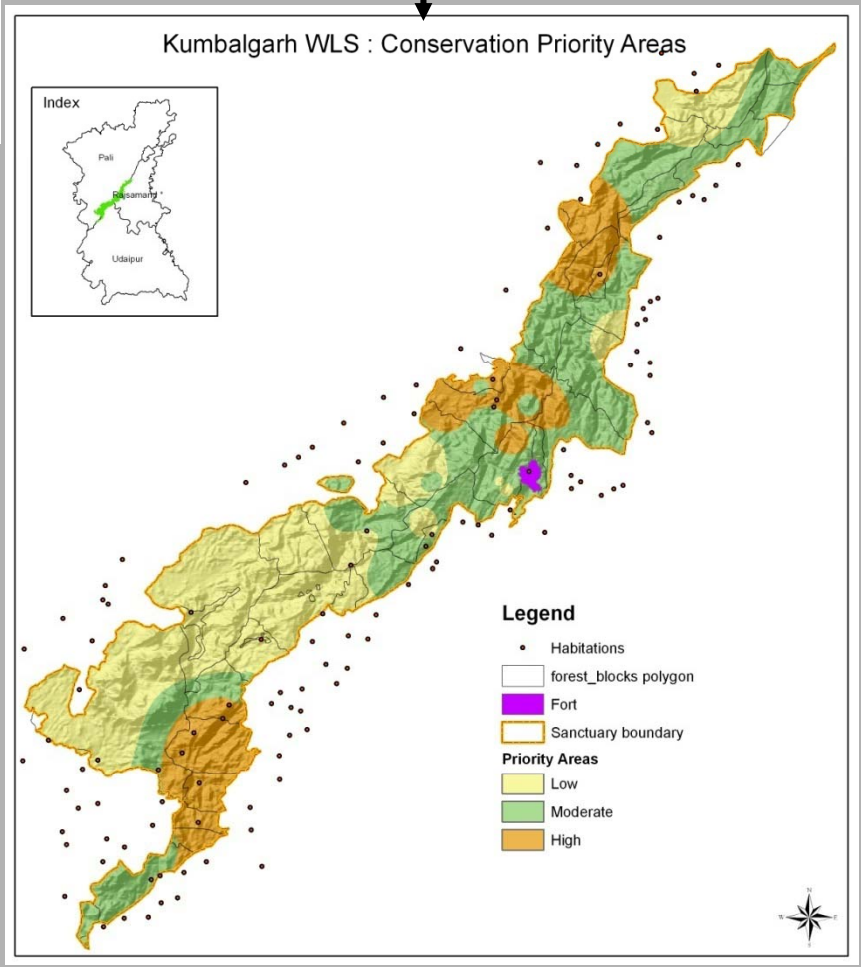
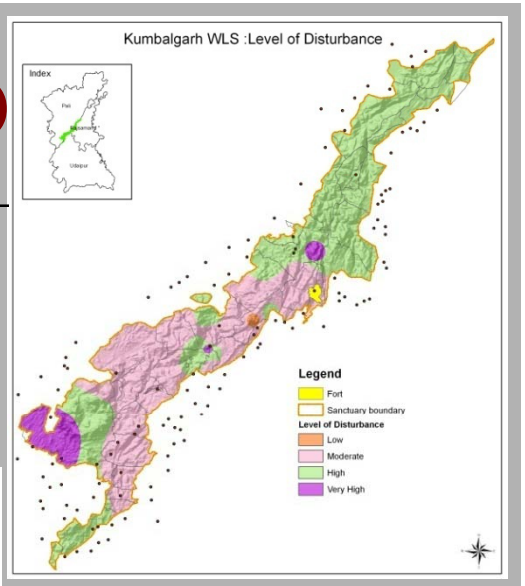
Conservation Priority Areas (CPAs)



Mod to low Biodiversity Richness areas are more

7 Blocks -High,
18 Moderate,
9 Low





Disturbance is mod to high

17 Blocks High
16 Moderate
1 Very high

11 Blocks High Priority,
17 Moderate
6 Low
Palar, Roopnagar, Desuri,Ghanerao, Bagol, Bokhada, Umarna, Semud, Bisma, Padrada, Mamadev ki Bugh

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Conservation Priority Areas (CPAs)

✓**High Biodiversity Richness Areas are less, compared to Mod & Low**

✓**High & Mod Disturbance Areas with High threatened and High Biodiversity are the the Areas of Priority for Conservation Action.**

✓**If disturbance not controlled in High diversity and High Threatened Species Areas - decrease and lead to biodiversity loss.**

✓**Most of the CPAs lies in the Thorn mixed forest (TMF), and Sparse Deciduous forest (SDDF) in Kumbhalgarh WLS.**

Conservation Action Plan (CAP) Following – The Nature Conservancy (TNC)

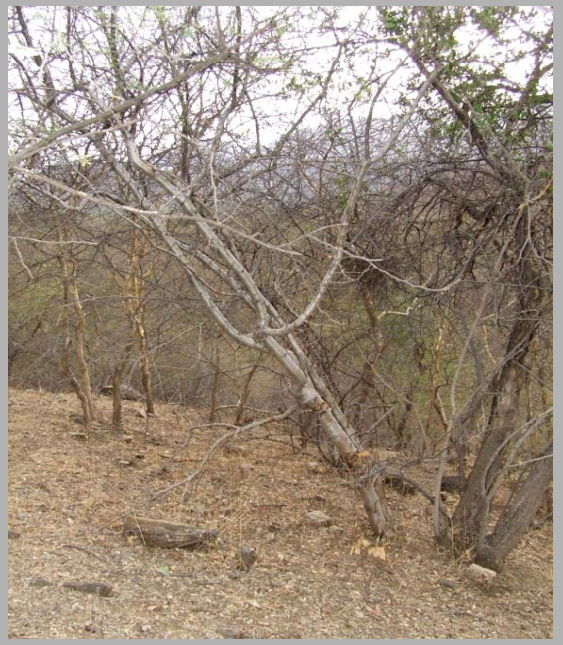
(TNC 2007)

Kumbhalgarh WLS

Ecological Systems i.e. CPAs or Thorn-mixed Forest, Sparse Dry deciduous forest and rocky areas. Threatened species present : White-naped Tit, *Commiphora wightii, Sterculia urens,* Starred Tortoise

Ecological Communities for e.g. 15 species of Raptors Long-billed Vulture Egyptian Vulture Eurasian Eagle Owl, Indian White-rump Vulture

Species specific conservation for e.g. Leopard, Sloth Bear, White-naped Tit, Grey Junglefowl, *Sterculia urens, Bosewelis serreta, Commiphora wightii*



Species specific conservation

Leopard – Top Predator – Present in all forest types

Ecological Attribute: Lack of favorable sized prey

Critical Threats	Conservation Action	Indicators of Monitoring
➢Habitat Loss for small sized to medium sized prey species ➢Spread of invasive species which have taken over grazing areas ➢ Low availability of fodder ➢Competition from livestock especially in the periphery areas	✓Regulating grazing around the villages ✓Removal of Invasive species and restore short perennial *fodder (grass) species for medium to small prey. ✓Removal of tall grasses. ✓Extensive engagement with local communities to evolve strategies for reducing pressure	❖Abundance in medium to small sized prey species. ❖Frequency of sighting of animals. ❖Frequency of indirect evidence for e.g. tracks, scats, diggings etc. ❖Scat analysis- remains of livestock in leopard scat.

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Sloth Bear – Seed Disperser & Flagship species
Ecological Attribute – Decrease in Habitat.

Critical Threats	Conservation Action	Indicators of Monitoring
➢Habitat Loss- Low availability of food, Decrease in population of fruiting trees, Low availability of Big trees resulting in low number of Bee-hives. ➢Low availability of termite mounds and ant nests because of livestock movement (soil loss). ➢ Forest Fire- results in death of fallen seeds consequently results in low regeneration. ➢Spread of Invasive species- lack of space for regeneration of trees, shrubs and climbers.	✓Restoration of *fruiting trees. ✓Restoration of *big sized trees. ✓Removal of invasive species. ✓Soil and moisture conservation measures ✓Plantation of fruiting trees in village environs and proper protection by VFCs/ EDCs. ✓Regulatory grazing even in Protected plots ✓Extensive education program and dialogue with local communities.	❖Relative abundance of tracks, digging and droppings. ❖Frequency of sighting of animals in different age and size classes. ❖Richness and abundance of fruiting and big sized trees, shrubs and climbers. ❖No. of bee-hives and ant nests in the landscape. 

***Fruiting species:** *Zizypus mauritiana, Ficus benghalensis, Syzygium cumini, Carissa spinarum, Cordia dichotoma Grewia elastica, G. flavescens, G. tiliifolia*

***Big sized Trees:** *Terminalia bellerica, T. tomentosa, T. arjuna*, and *Ficus benghalensis, F. religiosa, F. racemosa*

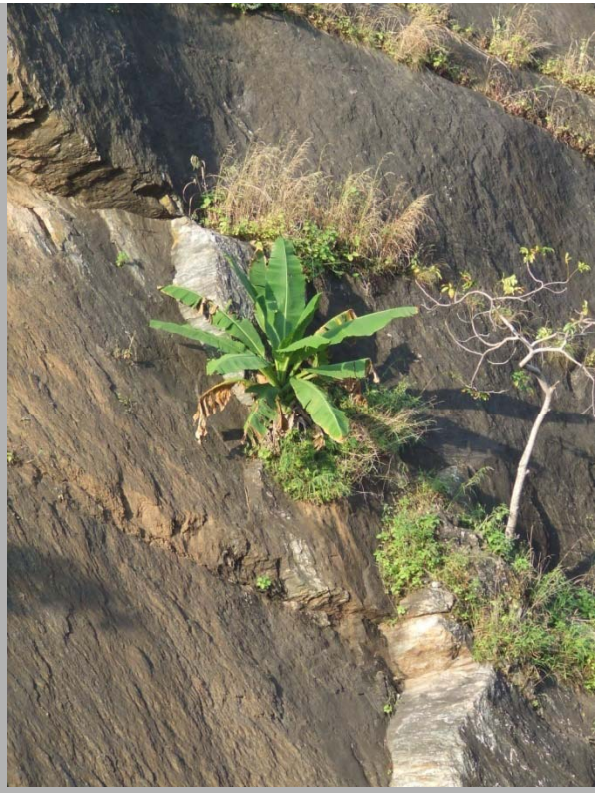
Pied Tit – Indicator of Tropical Thorn and *Anogeissus pendula* mixed Thorn forest
Ecological Attribute: Low availability of nesting sites & low numbers

Critical Threats	Conservation Action	Indicators of Monitoring
➢Habitat Loss- Cutting, lopping and encroachment in thorn forest ➢Low availability of big-sized thorn trees. ➢Low Availability of nest holes. ➢Low availability of thorn patches ➢ Forest Fire & Overgrazing- results in death of fallen seeds consequently results in low regeneration.	✓Planting of Thorn species especially Acacias. ✓Stringent Protection (through support of VFCs/ EDCs) – Patches with large sized thorn trees and individuals of large sized thorn tree. ✓Regulate grazing - increase protection – increased natural regeneration. ✓Enhance nesting sites - Provide nest boxes; Soil & Moisture Conservation – to provide improved conditions for natural regeneration and growth of saplings; ✓Soil and moisture conservation ✓Extensive education program.	❖No.of White-naped Tits ❖No.of Individuals sighted at single spot – Breeding success ❖Number of nest holes and boxes occupied 

Thorn species: *Acacia nilotica, A. leucophloea, A. senegal, Prosopis cineraria, Maytenus emarginatus*

Grey Jungle Fowl – Prefers Forest with Undergrowth
Ecological Attribute: Restricted to certain dense patches

Critical Threats	Conservation Action	Indicators for Monitoring
➢Spread of Invasive species: *L. camara* inside & *Prosopis juliflora* in the buffer areas and close to boundary; ➢Overgrazing – Decrease in forest undercover & trampling of eggs (ground nest). ➢Loss of habitat – Decrease species providing natural ground cover; ➢Fire – loss of habitat and nests	✓Restoration - Immediate removal of *P.juliflora* & systematic and phased removal of *L. camara*; ✓Planting of shrubs, straggling shrubs & small trees along small nullahs and streams and lower to middle slopes in all the degraded forest types; ✓Regulate grazing - Along the boundaries and buffer zones & environs of villages ✓ Stringent protection – restored habitats, control of fire support by VFC/EDC villages inside and along boundary & buffer villages outside ✓Extensive education program.	❖No.of jungle fowls ❖Frequency of sighting of jungle fowls ❖Sightings of different age and sex classes ❖More sighting in the restored habitats 



The Ultimate goal and Long term endeavor is to work towards setting up of

"SOUTHERN ARAVALLI BIOSPHERE"

Thank You

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