GOVERNMENT OF RAJASTHAN
FOREST DEPARTMENT

सत्यमेव जयते

MANAGEMENT PLAN
OF

PHULWARI KI NAL
WILDLIFE SANCTUARY

2025-26 to 2034-35

Submitted by
DEPUTY CONSERVATOR OF FORESTS
WILDLIFE, UDAIPUR (RAJASTHAN)

PREFACE

Phulwari ki nal Wildlife Sanctuary situated amidst the sylvan charms and winding valleys of Aravalli hill Ranges, is spotted with endemic fauna and alluring flora. Geographically the area of this sanctuary falls within revenue limits of Udaipur District of the State of Rajasthan. The tracts forming the Sanctuary, were remained as favourite hunting grounds for the erstwhile rulers of Panarwa, Juda and Umriya States. In 1983 the area was declared as Wildlife Sanctuary under the Wildlife (Protection) Act, 1972. The administration and management control of Sanctuary area had been with the Divisional Forest Officer of Revenue District. Till 1987 the management of Sanctuary area was done on the basis of prescriptions laid down in working plan of Udaipur Forest Division. In the year 1988, the sanctuary was transferred to Wildlife Wing. Since then, the management of Wildlife Sanctuary is being done on the basis of Annual Plans. With an objective to manage the sanctuary on principals of scientific management, the present management plan is prepared for the period of 10 years (2025-2026 to 2034-2035). This management plan includes all the constituents required to manage the Wildlife Sanctuary, Phulwarikinal.

The management plan consists of two parts. Part A of the plan deals with introduction and existing situation in and around Sanctuary area. It has eight chapters. Part B of plan contains the Suggestive Prescriptions for management of the Peripheral Zone of Influence (ZoI) for the next ten years. It contains two chapters. Annexures and maps have been included to make the plan most informative and referable for concerned & field staff.

The management plan is a dynamic document. Though the document period has been 2025-2026 to 2034-2035, it needs periodic review and updating of information. The data will be reviewed constantly through studies, research, monitoring and baseline survey & will be incorporated at a future date.

Udaipur
June 22th, 2025

(Yadvendra Singh Chundawat)
Dy. Conservator of Forests,
Wildlife, Udaipur

ACKNOWLEDGEMENTS

At the very outset we would like to express our gratitude's to Shri Arijit Banerjee, Principal Chief Conservator of Forests and Head of Forest Force, and Ms Shikha Mehra Principal Chief Conservator of Forests and CWLW Rajasthan for providing encouragement, valuable guidance and support which helped us to prepare a meaningful and dynamic document incorporating down to earth proposals for management of Phulwari-Ki-Nal Wild Life Sanctuary.

We are extremely thankful to Shri Rajesh Gupta, APCCF (wildlife) and Shri Seduram Yadav, Chief Conservator of forests, Wildlife Udaipur for valueable suggestations based on which the present management plan has been prepared.

Thanks are extended to Dr. Satish Kumar Sharma for his corporation. Thanks are also due to Shri Kapil Kumar, ACF Phulwari kin al and all the Range Officers, Foresters, Asstt. Foresters, Forest Guards of the Sanctuary posted during the preparatory period of this management plan, for being instrumental in collecting the basic data, maps and relevant information, without which the present document would never have seen the light of the day. Thanks are also due to all the Range officers who are posted in the sanctuary and shared their valuable experiences in giving final shape to this plan. Thanks are also due to local people, who helped in various ways to prepare this management plan.

Last but not the least, we are thankful to all forest officials of the Forest Department, Rajasthan for their guidance and co-operation.

The Management Plan is compilation of management ideas combined with field wisdom. The staff of Phulwari ki nal Wildlife Sanctuary are having rich experiences of local condition. Thanks to all staff members and field workers for inspiring us and sharing the knowledge in formulating the strategies for the management plan.

Udaipur
June 22th, 2025

(Yadvendra Singh Chundawat)
Dy. Conservator of Forests,
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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE STATE

Rajasthan is the largest state in India by area, making up 10% of the country's total land. The state is divided into two unequal sections by the Aravalli mountain ranges, which stretch from the west to the northeast. The area located to the west of the Aravalli range comprises mainly arid and semi-arid regions, forming part of the Indian Thar Desert, with 61 percent of the desert found within Rajasthan. Conversely, the region to the east of the Aravalli range and the southwestern areas have more favorable agro-climatic conditions and host the well-developed forests of Rajasthan. Additionally, the eastern and southeastern regions of the state are enriched by several rivers and streams, teeming with diverse vegetation and wildlife.

Rajasthan's forests fall into two main categories: tropical dry deciduous forests and tropical thorn forests, which are further classified into 20 distinct forest types. The predominant forest types in Rajasthan include Northern Dry Deciduous Forest (40.07%), Anogeissus pendula forest (15.21%), dry deciduous scrub (10.96%), desert dune scrub (06.62%), and desert thorn forest (06.17%). Protected forests make up 3.92% of the

state's total geographical area, encompassing 3 National Parks, 26 Wildlife Sanctuaries, and 36 Conservation Reserves. The state is home to 5 tiger reserves (Ranthambore, Sariska, Mukundara Hills, Ramgarh Vishdhari, and DholpurKarauli) as well as 2 Ramsar sites (Keoladeo National Park and Sambhar Lake). The overall protected area of the state is 13418.11 sq. km.The evaluation carried out by the Indian Forest Survey in 2019 reveals that there are 3,826 wetlands spanning an area of 56,341 hectares within the state's recorded forest area. This includes 284 natural local wetlands covering 21,519 hectares and 1,275 local artificial wetlands covering 28,064 hectares, highlighting the necessity for effective scientific management of forests to enhance these wetlands.

Rajasthan has 9,829 square kilometers of grasslands, which constitutes approximately 2.9 percent of the state's total geographical area. Within these grasslands, there are 375 species of plants and animals from 46 families and 188 genera.

According to the 2011 census, Rajasthan has a population of 68.55 million, accounting for 5.66 percent of India's overall population. The Twentieth Livestock Census conducted in 2019 reported that the total livestock population in the state is 56.80 million, ranking it second highest in the nation for livestock numbers. Of this total, 54.94 million livestock are located in the state's rural areas. This number includes 13.9 million cattle, 13.7 million buffalo, 7.9 million sheep, 2.13 million camels, and 20.8 million goats, with most livestock relying on fodder sourced from forests and forest-based resources, as stall feeding is less common in the region.

According to the India State of Forest Report (ISFR) 2019 published by the Forest Survey of India, communities residing in villages adjacent to

forests rely on these areas for various resources: 8.5 million tonnes of fuel, 112.7 million tonnes of fodder, 3,698 tonnes of bamboo, and 82.4 thousand cubic meters of minor timber. This information highlights the importance of forests and forest-derived resources for the economic and social welfare of the state's population, particularly in rural and forest-dependent villages.

1.2 PROTECTED AREA NETWORK OF THE STATE

Rajasthan is home to a wide variety of plant and animal species, despite the harsh climatic conditions that dominate much of the region. The differences in forest types are quite apparent, transitioning from arid thorn forests in the west to more humid deciduous forests in the east, largely dictated by the rainfall gradient. The ancient Aravalli Mountain range, one of the oldest mountain systems globally (with its name originating from the geological term – Ara Vertical, Valli Mountain), plays a crucial role in influencing both plant diversity (such as the pure stands of Anogeissus pendula forests) and animal diversity.

The forested areas in southern and south-central Rajasthan lie within the hilly landscape of the Aravalli mountains, characterized by steeply uneven terrains. The southeastern region is marked by dry deciduous forests, including tropical dry broadleaf forests that are home to species like Tectona, Acacia, and more.

The Rajasthan Forest Department plays a vital role in protecting threatened and endangered wildlife by creating protected areas for these species and improving habitat quality through active

management strategies. The state includes 3 National Parks, 26 Wildlife Sanctuaries, and 36 Conservation Reserves, all dedicated to this mission, along with 5 tiger reserves.Currently, the more densely wooded regions of the State are primarily found within sanctuaries and national parks, many of which face significant biological stress due to nearby villages. This biological stress diminishes the habitat availability for wildlife and fosters competition for natural resources between large carnivores and humans.

List of Protected Areas in Rajasthan as on Dec.2023

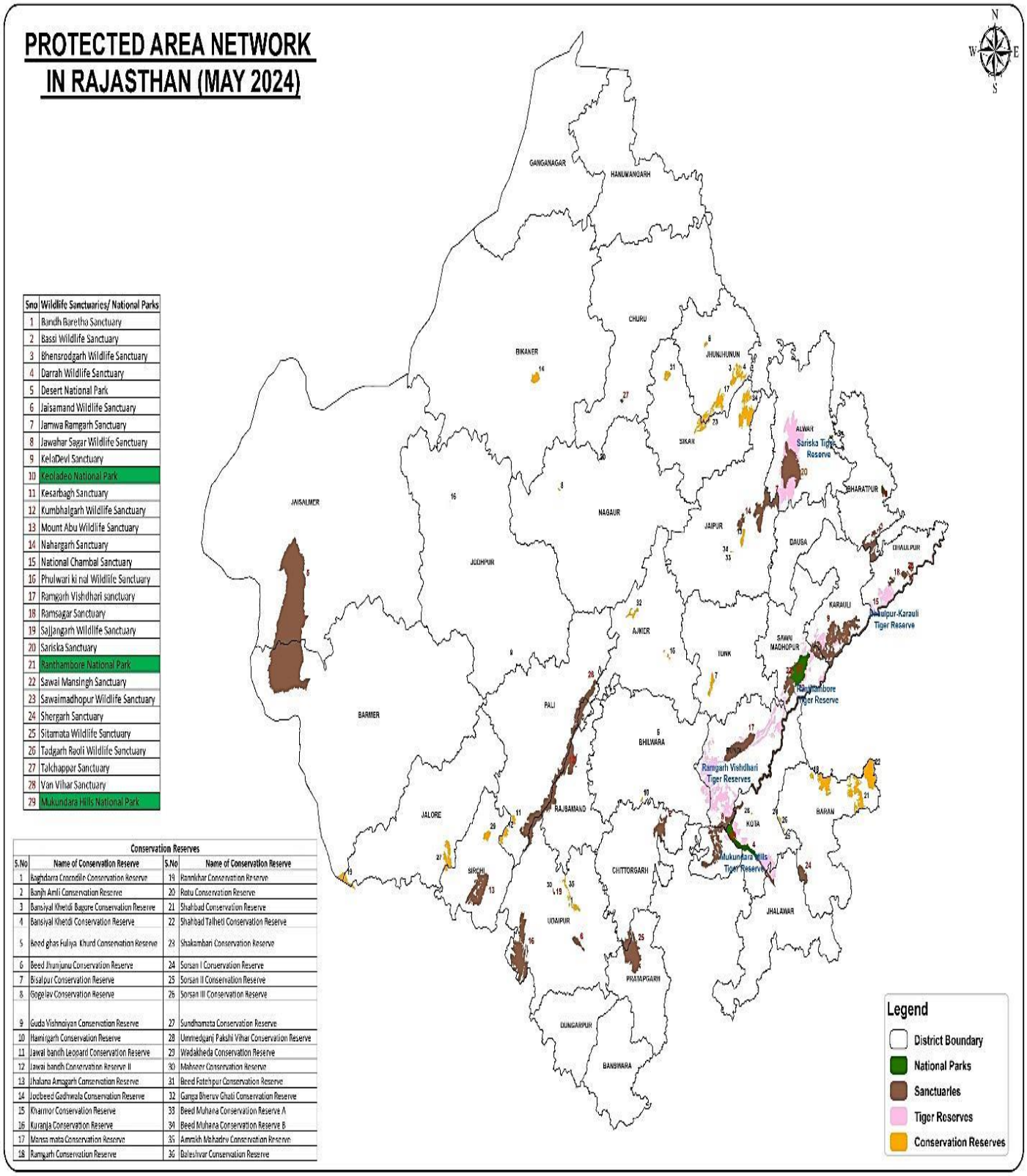
S.no	Protected Area Name	District	Area (Sq. Km.)
A	**National Parks**		
1	Keoladeo National Park	Bharatpur	28.73
2	Mukundra Hills National Park	Kota, Chittorgarh	200.43
3	Ranthambhore National Park	Sawai Madhopur	289.11
B	**Wildlife Sanctuaries**		
1	Band Baretha Sanctuary	Bharatpur	171.19
2	Bassi Sanctuary	Chittorgarh	138.50
3	Bhensrodgarh Sanctuary	Chittorgarh	273.54
4	Darrah Sanctuary	Kota, Jhalawar	233.46
5	Desert National Park Sanctuary	Jaisalmer, Barmer	3162.00
6	Jaisamand Sanctuary	Udaipur	52.34
7	Jamwa Ramgarh Sanctuary	Jaipur	300.00
8	Jawaharsagar Sanctuary	Kota, Bundi,Chittorgarh	210.62
9	Keladevi Sanctuary	Karoli, Sawai Madhopur	676.82
10	Kesarbagh Sanctuary	Dholpur	14.76
11	Kumbhalgarh Sanctuary	Rajsamand, Udaipur, Pali	610.53
12	Mount Abu Sanctuary	Sirohi	103.97
13	Nahargarh Sanctuary	Jaipur	52.40
14	National Ghariyal Sanctuary	Kota, Bundi, Sawaimadhopur,	564.03

		Karoli, Dholpur	
15	Phulwari ki Naal Sanctuary	Udaipur	511.41
16	Ramgarh Vishdhari Sanctuary	Bundi	303.05
17	Ramsagar Sanctuary	Dholpur	34.40
18	Sajjangarh Sanctuary	Udaipur	5.19
19	Sariska Sanctuary	Alwar	544.22
20	Sawaimadhopur Sanctuary	Sawai Madhopur	288.83
21	Sawaimansingh Sanctuary	Sawai Madhopur	121.60
22	Shergarh Sanctuary	Baran	81.67
23	Sitamata Sanctuary	Udaipur, Chittorgarh	422.94
24	Talchappar Sanctuary	Churu	7.19
25	TodgarhRaoli Sanctuary	Rajsamand, Ajmer, Pali	495.27
26	Van Vihar Sanctuary	Dholpur	25.60
C	**Conservation Reserves**		
1	Bansial-KhetriBagore Conservation Reserve	Jhunjhunu	39.66
2	Bansial-Khetri Conservation Reserve	Jhunjhunu	70.18
3	Beed Jhunjunu Conservation Reserve	Junjhunu	10.47
4	Bisalpur Conservation Reserve	Tonk	48.31
5	Gogelav Conservation Reserve	Nagaur	3.58
6	GudhaVishnoiyan Conservation Reserve	Jodhpur	2.32
7	Jawai Bandh Leapard	Pali	61.98

	Conservation Reserve II		
8	Jawaibandh Leopard Conservation Reserve	Pali	19.79
9	JodbeedGadhwala Bikaner Conservation Reserve	Bikaner	56.47
10	Mansa mata Conservation Reserve	Jhunjhunu	102.31
11	Rotu Conservation Reserve	Nagaur	0.73
12	Shahbad Conservation Reserve	Baran	189.40
13	Shakambari Conservation Reserve	Sikar, Junjhunu	131.00
14	Sundhamata Conservation Reserve	Jalor, Sirohi	117.49
15	Ummedganj Pakshi Vihar Conservation Reserve	Kota	2.72
16	Rankhar CR	Jalore	72.88
17	Shahbad Taleti CR	Baran	178.84
18	Beed Grass Fuliya Khurd CR	Bhilwara	0.86
19	Baghdara Crocodile CR	Udaipur	3.69
20	Vadakheda CR	Shiroi	43.31
21	Jhalana-Amagarh CR	Jaipur	35.07
22	Ramgarh CR	Barna	38.09
23	Kharmor CR	Ajmer	9.31
24	Hamirgarh CR	Bhilwara	5.66
25	SorsanIst	Baran	16.11
26	SorsanIInd	Baran	4.27
27	SorsanIIIrd	Baran	0.76
28	Kurnja CR	Jodhpur	2.92
29	Banjhamli CR	Baran	146.21
30	Baleshwar Conservation Reserve	Neem Ka Thana	221.69

31	Beed Muhana CR-A	Jaipur Rural	2.07
32	Beed Muhana CR-B	Jaipur Rural	0.10
33	Ganga Bhairav Ghati CR	Ajmer	39.51
34	Mahaseer CR	Udaipur	2.06
35	Beed Fatehpur CR	Sikar	30.03
36	Amrakh Mahadev Leopard CR	Udaipur	71.47
D	**Tiger Reserves**		
1	Ranthambhore Tiger Reserve	Sawaimadhopur, Karauli, Bundi, Tonk	1530.23
2	Sariska Tiger Reserve	Alwar, Jaipur	1213.34
3	Mukundara Hills Tiger Reserve	Kota, Bundi, Jhalawar, Chittorgarh	1135.79
4	Ramgarh Vishdhari Tiger Reserve	Bundi, Kota, Bhilwara	1496.49
5	Dholpur-Karauli Tiger Reserve	Dholpur, Karauli	599.64
E	**Under Process**		
1	Desert National Park Sanctuary	Jaisalmer, Barmer	3162.00
2	Sariska National Park	Alwar	405.93
3	Kumbhalgarh National Park	Pali, Udaipur &Rajsamand	462.05
4	Band Baretha Sanctuary	Bharatpur	197.86
5	Sariska 'A' Sanctuary	Alwar	3.01
6	Dholpur Sanctuary	Dholpur	204.26
7	Mount Abu Sanctuary	Sirohi	222.13
8	Gajner Sanctuary	Bikaner	26.32

(**Source Annual Administrative Report 2023-24**)



Sno	Wildlife Sanctuaries/ National Parks
1	Bandh Baretha Sanctuary
2	Bassi Wildlife Sanctuary
3	Bhensrodgarh Wildlife Sanctuary
4	Darrah Wildlife Sanctuary
5	Desert National Park
6	Jaisamand Wildlife Sanctuary
7	Jamwa Ramgarh Sanctuary
8	Jawahar Sagar Wildlife Sanctuary
9	KelaDevi Sanctuary
10	Keoladeo National Park
11	Kesarbagh Sanctuary
12	Kumbhalgarh Wildlife Sanctuary
13	Mount Abu Wildlife Sanctuary
14	Nahargarh Sanctuary
15	National Chambal Sanctuary
16	Phulwari ki nal Wildlife Sanctuary
17	Ramgarh Vishdhari sanctuary
18	Ramsagar Sanctuary
19	Sajjangarh Wildlife Sanctuary
20	Sariska Sanctuary
21	Ranthambore National Park
22	Sawai Mansingh Sanctuary
23	Sawaimadhopur Wildlife Sanctuary
24	Shergarh Sanctuary
25	Sitamata Wildlife Sanctuary
26	Tadgarh Raoli Wildlife Sanctuary
27	Takhappar Sanctuary
28	Van Vihar Sanctuary
29	Mukundara Hills National Park

Conservation Reserves			
S.No	Name of Conservation Reserve	S.No	Name of Conservation Reserve
1	Raghdarra Crocodile Conservation Reserve	19	Ramkhar Conservation Reserve
2	Banjh Amli Conservation Reserve	20	Ratu Conservation Reserve
3	Bansiyal Khetdi Bagore Conservation Reserve	21	Shahbad Conservation Reserve
4	Bansiyal Khetdi Conservation Reserve	22	Shahbad Talheti Conservation Reserve
5	Beed ghas Kuliya Khurd Conservation Reserve	23	Shakambari Conservation Reserve
6	Beed Jhunjuna Conservation Reserve	24	Sorsan I Conservation Reserve
7	Bisalpur Conservation Reserve	25	Sorsan II Conservation Reserve
8	Gogelav Conservation Reserve	26	Sorsan III Conservation Reserve
9	Guda Vishnoiyan Conservation Reserve	27	Sundhamata Conservation Reserve
10	Hamirgarh Conservation Reserve	28	Ummedganj Pakshi Vihar Conservation Reserve
11	Jawai bandh Leopard Conservation Reserve	29	Wadakheda Conservation Reserve
12	Jawai bandh Conservation Reserve II	30	Mahseer Conservation Reserve
13	Jhalana Amagarh Conservation Reserve	31	Beed Fatehpur Conservation Reserve
14	Jodbeed Gadhwala Conservation Reserve	32	Ganga Bheruv Ghati Conservation Reserve
15	Khamor Conservation Reserve	33	Beed Muhana Conservation Reserve A
16	Kuranja Conservation Reserve	34	Beed Muhana Conservation Reserve B
17	Mansa mata Conservation Reserve	35	Amrakh Mahadev Conservation Reserve
18	Ramgarh Conservation Reserve	36	Baleshvar Conservation Reserve

1.3 MAJOR BIODIVERSITY CONSERVATION AND MILESTONES

1. Ramgarh Vishdhari Sanctuary has been notified 4th Tiger Reserve in the state and in principle approval also has been obtained for Dholpur-Karauli and Kumbhalgarh Tiger. To increase the protected area in the state, many conservation reserves like Mansa Mata, Beed Jhunjhunu, Shahbad, Rankhar, Beed Muhana, BhanjhAmli, Mahasheer etc. have been notified.

2. Wildlife Surveillance & Antipoaching System (WS & APS) Project is an Integral Software based Surveillance solution for Protected Area like Ranthambhore Tiger Reserve, Sariska Tiger Reserve, Mukundra Hills Tiger Reserve, Jawai Bandh Leopard Conservation Reserve, Jhalana Conservation Reserve which includes high level Thermal/Optical Cameras, point to point wireless network and communication equipments.

3.A project for Biodiversity Conservation has been sanctioned through the French Development Agency and efforts are being made to get another sanction through JICA.

4. New Forest policy, Climate change policy and eco-tourism policy have been launched in the state. In Rajasthan Ecotourism Policy special importance has been given to conservation of natural sites and livelihood management through ecotourism. Private enterprise

would be encouraged so as to get the involvement of local communities in the environment preservation.

5. As a result of these efforts, interest towards forests and wildlife in the state has increased among the people and forests have increased., Wildlife and environment related activities have gained momentum as well.

6. To increase vegetation cover outside the forest area, the Tree Outside Forest scheme has been launched and being implemented in the whole state.

7. According to the tripartite MoU between the Government of India, Wildlife Institute of India and the State Government for the conservation of the critically endangered State bird-Godavan, artificial breeding of the Godavan has been started in Sam and Ramdeora. Under which 27 chicks of Godavan have been hatched are being nurtured. Conservation efforts for Kharmor have also been initiated in Sonkhaliya, with declaration of a Conservation Reserve.

8. State Wetland Authority has been constituted by the State Government in the year 2019-20. 76 wetlands have been notified in the state and efforts have been initiated to declare 5 wetlands as Ramsar sites.

9. For prey base augmentation, translocation of surplus herbivores population from Zoos, Biological Parks, KNP etc. to the lesser prey base PAs and Sucessfuly rewilding in natural habitats.

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CHAPTER-2
INTRODUCTION TO THE PA & BACKGROUND INFORMATION

2.1 NAME AND CONSTITUTION/NOTIFICATION

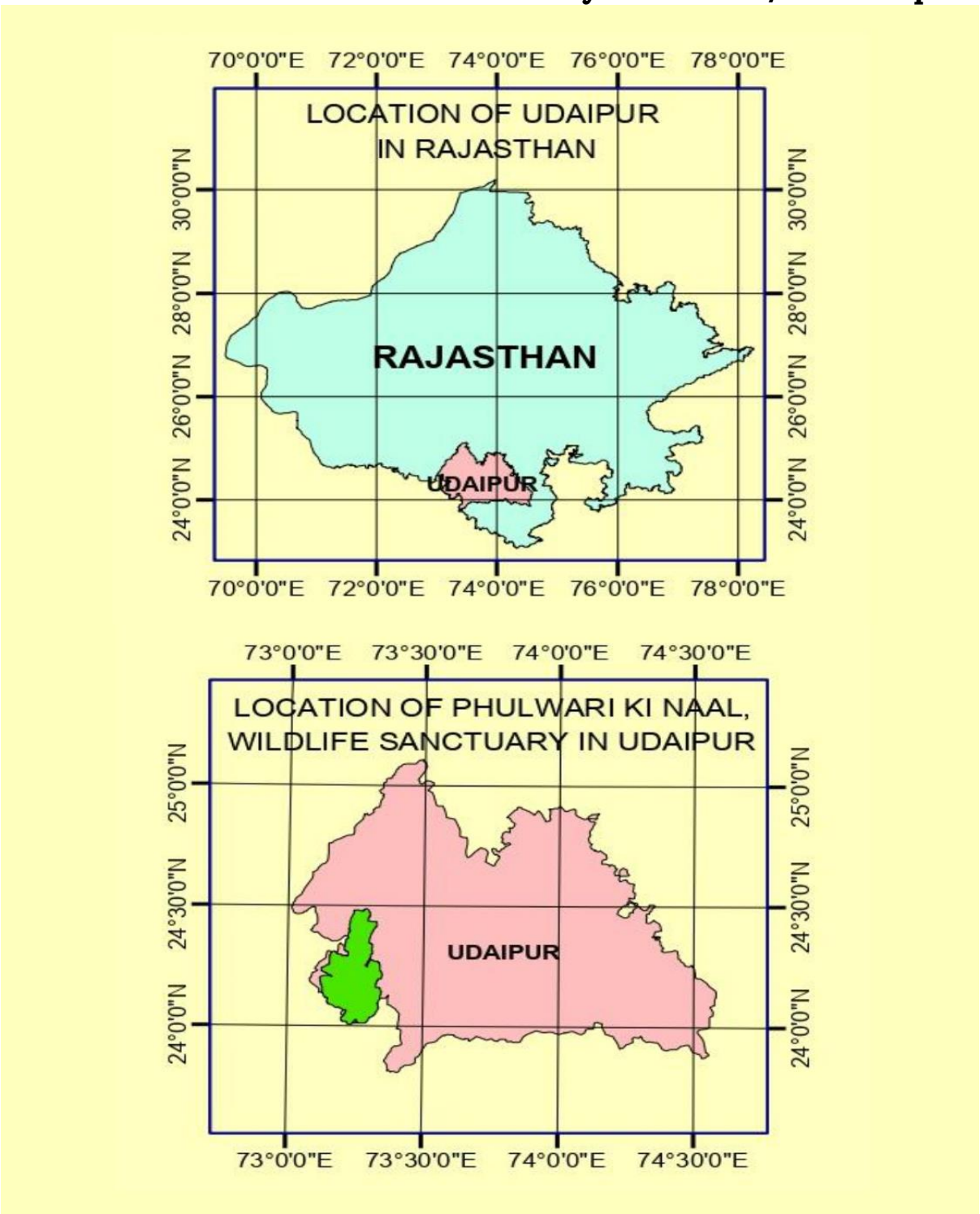
The management plan deals with the forest area of Phulwari Wildlife Sanctuary with head quarter at Kotra in Udaipur district of Rajasthan.Phulwari was declared as a Sanctuary Vide Govt. of Rajasthan notification no. F. 11 (1) 8/83 Revenue dated 6.10.1983. It is being managed by the Wildlife Wing since August 1988. The final notification under section 26A by the State Govt. is still to be issued. The action to be performed by the collector under section 19 to 25 have been completed in the year 1997.There are 11 Forest Blocks is the sanctuary comprising an area of 511.41 sq km out of which 365.92 sq km as Reserve Forest (RF) and 145.49 sq km Protected Forests (PF).

The details of area range wise & block wise, district wise, compartment wise & legal status wise are enclosed at Annexure-1 to 3. Copy of notification is enclosed at "Annexeure-4".

2.2 LOCATION, PHYSICAL BOUNDARIES, AND EXTENT

Geographically this sanctuary is situated between 24^0 to $24^0$10' N Latitude and $73^0$20' E Longitude.. It is situated 123 km from Udaipur, 55 km from Swaroopganj and 96 km from Mt. Abu. Kherbrahma and Ambajitown known for the temple of goddess Amba are 25 & 50 km awayrespectively in the bordering Gujarat State from the Sanctuary.
There are 11 Forest Blocks is the sanctuary comprising an area of 511.41 sq km out of which 365.92 sq km as Reserve Forest (RF) and 145.49 sq km Protected Forests (PF).

Location of Phulwari Ki Nal Sanctuary on District/State Map



Phulwari Sanctuary is situated in southern Aravallis, near border of Rajasthan and Gujarat states. This sanctuary is surrounded by isoclimatic and isohabitatic forest cover all around. To the north, forests of the sanctuary merge with the territorial forest of Ramkunda, Torna,

Ladan etc. In the south, area it is in continuity with forests of Vijainagar Range of Gujarat state. On the East, forest of Dhala, Som II are present in continuity. Similarly on the west, territorial forests of Samoli, Merpur etc. forest blocks are in continuity.

Except western side, ecological boundaries of rest three directions get the sanctuary amalgamated with the forests, of Deloa, Gogunda, Ogna, Kotra and Jhadol forest ranges which have quite similar floral composition. Towards west, forests of Kotra range are in continuity, but as one moves towards far west, dryness increases and vegetation tend to more xerophytic.

The forests of the sanctuary are interspersed with agriculture fields and as many as 134 villages are present inside sanctuary. The biotic pressure by the villagers greatly influence the management of sanctuary.

A. North:

Northern end of Dhedmariya forest block, southern end of Ramkunda forest block and northern end of Harwa Forest Block will make 'Northern boundary'

B. South:

Southern boundaries of Daiya, Ambasa, Ashawara and Mamer Forest Blocks.

C. East :

Eastern boundaries of Harwa, Devli, Dharavan and Daiya Forest Blocks.

D. West:

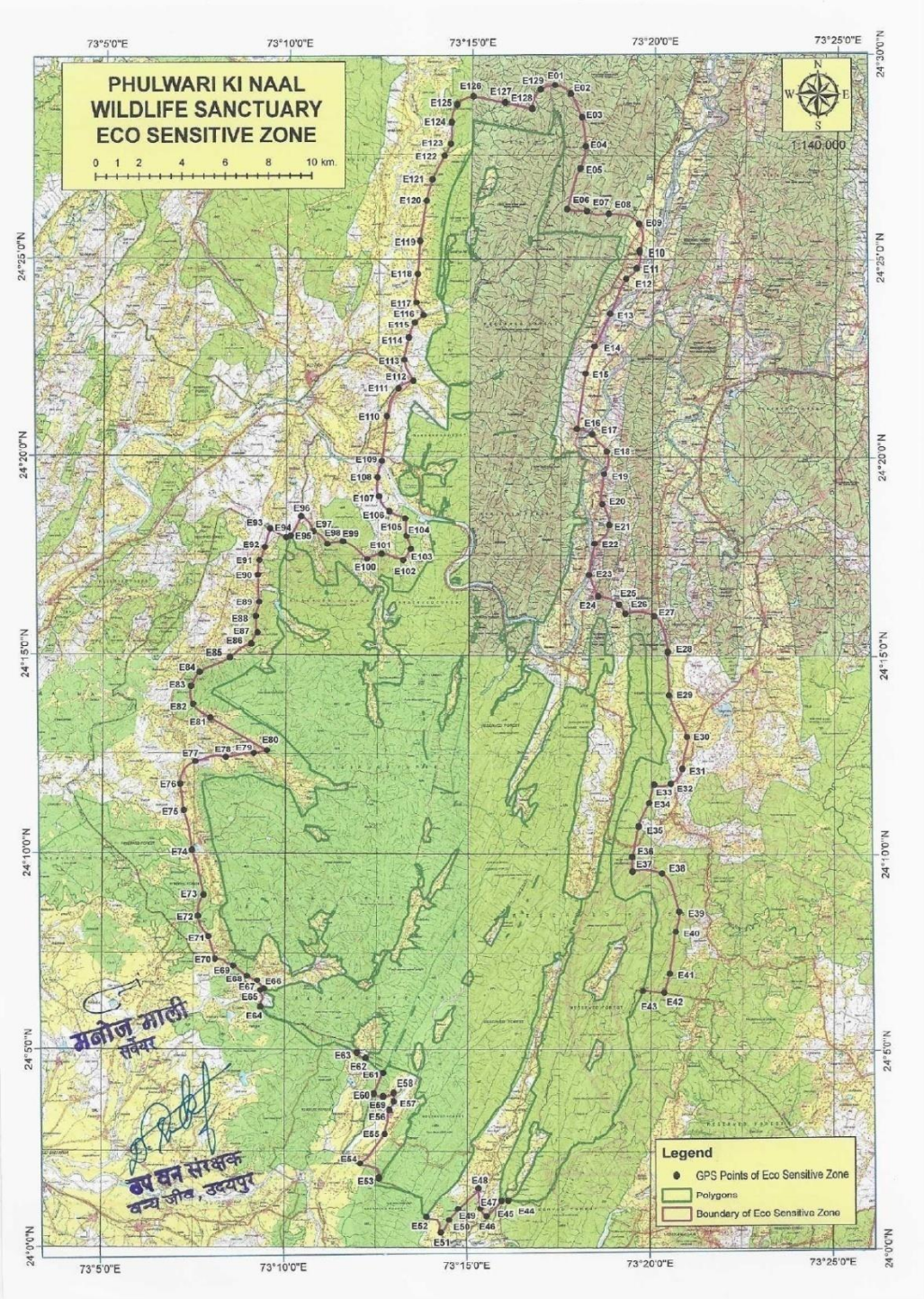
Western boundaries of Mamer, Umaria, Phulwari, Devli and

Dhedmariya forest blocks.

2.3 ZONE OF INFLUENCE

The zone of influence extends over entire periphery of the forest, except area of neighbouring state Gujarat . Eco sensitive zone of the sanctuary is notified on may 17th, 2024. List of activities permited, regulated and prohibited are described in Part B.

Survey of India topo sheets of the ESZ area with demarcation of the boundary of Sanctuary and the ESZ area



2.4 STATEMENT OF SIGNIFICANCE

2.4.1 Ecological/Biodiversity – floral and faunal

The Phulwari Wildlife Sanctuary is well protected, exploring full range of habitat in Aravalli range. It is important from geographical point of view as it constitutes Teak and Rosewood in a fairly good percentage. Phulwari Sanctuary is ecologically important as it forms a part *of* the largest viable forest tract among the fragmented forest belt of Rajasthan. It is pro-runner toMt. Abu sanctuary on western direction. The vegetation closely resemble with that of Mt. Abu, only exception being that of Indrok (*Anogeissus sericea*) which is in abundance in Mt. Abu and is in very small number in Phulwari Sanctuary.

The forest ofthe sanctuary is dense (canopy density being 0.6 to 0.7). It provides an ideal attraction for tourists. The Wakal river, which is the main tributary of river Sabarmati, bisects the sanctuary into two unequal halves. There are several gorges (deep water holes) in the river-bed itself which are ideally suited for crocodiles and are seldom spotted.

Near village Daiya, there is a large Mahuwa, (*Madhuca latifolia*) grove (Plate –I) about 20 sq km in spread which is a rare thing to watch. Another Mahua grove is present near Mahad. The sanctuary has rendered protection to some rare and endangered fauna such as Sloth bear, Panther, Ratel, Pangolin, Grey Jungle Fowl, Aravalli Red Spurfowl, Flying Squirrel, Crocodile, Alexandrine Parakeet, Indian Balloon frog etc.

The floral diversity of Phulwari is unique. The interspersion of varied habitat make available wide range of plant species. A number of taxa of algae, fungi, Bryophytes, Pteridophytes, and Angiosperms are available here. This sanctuary is rich in orchids, tuberous plants, climbers and

lianas as well. Even crustose lichens are also present on rock and tree trunks. The undergrowth is thick. Bamboo (*Dendrocalamusstrictus*) grows luxuriantly. One can find the finest quality of bamboo in this protected area. Valleys and moist 'nallahas' are full of variety of medicinal plants. A large number of them are very important from ethnomedicological point of view.

Flora:

The forests of Phulwari sanctuary fall under "II Dry Tropical Forest" as per Champion and Seth's classification of forest types. The following subtypes and groups along with their subsidiary edaphic types are also recognized.

The main tree species found are Haldu, Mahua, Anwla, Gurjan, Dhaora, Salar, Tendu, Khirni, Karanj, Umbia, Bahera, Arjun, Aam, Karpata, Bad, Khajur, etc. and Bamboo in undergrowth. The average density is 0.3 to 0.8. The average height is 5 to 11 mts. The bamboo grows abundantly. The growth and regeneration is excellent. The natural regeneration of all species aregenerally profuse and abundant. Along the water courses, due to better availability of moisture, special micro climate has been formed in pockets. Tall evergreen trees occur at such places with dense undergrowth. The Mango, Rohini, Mahuwa, Kohra, Karonda, Bargad, Salix etc. are usually found which provide ideal condition both for food and shelter to a large variety of wild animals. The area in rich is Pteridophytes, Bryophytes and Thalophytes. *Centella asiatica, Ensetesuperbum*, *Jasminum grandiflorum, Dalbergia voulubilis,* orchids like *Vanda* and *Aerides*etc. are special element of this sanctuary. There is a need for detailed study of biota of this sanctuary to unearth several unreported life forms.

Khajur is a riverine species in this area and sometime make pure stands. It is found is abundance and is branched at some places which is a rare phenomenon. Another rare feature is presence of yellow flowered khakra (*Butea monosperma var. lutea*) at some places. Many rare plant species like *Venda tessilata, Aeridesmaculosum, Habanriafurcifera, H. plantaginea, Nerviliaaragona, Costus speciosus, Hiptage benghalensis, Argyreiastrigosa, Zinia elegans, Sauromaticum venosum, Ougeniaoojensis, Ampelopterusprolifera, Acampepremorsa, Eulopheaochreata* etc. are in distribution in this sanctuary.

Invasive species like Prosopis juliflora and Lantana camara have further compounded these issues, spreading aggressively and outcompeting native flora. Despite these challenges, there have been signs of natural regeneration, particularly following the declaration of the area as a sanctuary, though ongoing conservation efforts are essential to restore and protect the sanctuary's unique floral diversity.

Fauna:

Sloth Bear is also an important species confined to this PA. Sloth Bear uses wild fruits, honey, flowers and underground parts of many plant species as its food. The fruits of *Diospyros melanoxylon, Ficus glomerata, Phoenix sylvestris* and flowers of Madhuca latifolia are favorite food for sloth bear in this PA. It devour fruits of *Cassia fistula* also. The sloth bear needs wooded and unapproachable sites for shelter. The forest areas of Daiya, Ambasa, Phulwari ki Nal, Devli, Harva, Dhedmariya etc. form an ideal habitat for sloth bear. Bijphadia, a locality in Daiya area is well known for sloth bears. During season of Mahuwa flowering, Sloth bears can be seen in foothill zones also.

Flying squirrel, a recently reported animal species of this sanctuary in

mainly confined where density of Mahua tree is high. This species lives in hollows of old trees and like new shoots of Mahuwa tree for food.

Panther is an apex species of this sanctuary which needs wooded and shrubby area. Fairly good population of panthers exist in this sanctuary. Panthers quite often invade and kill the domestic live stock to fulfil their food requirements.

Jackals and Hyenas are also found living co-existingly in similar habitat condition. Common Mongoose and Ruddy Mongoose are also present in the Sanctuary.

This sanctuary is also rich in bird life. The Grey Jungle fowl and Aravalli Red Spurfowl is confined in interior areas where bushy thicket is available. A variety of arboreal, terrestrial and aquatic birds are present here. Wakal, a prominent river of the sanctuary is full of aquatic birds and other life forms including crocodile. Crocodiles of this sanctuary are very cryptic, broadly nocturnal, live in dens made by them in riverbank or in the space present below huge rocks.

Herpetofauna is rich here. Green Whip Snake, Python, Rat Snake, Cobra, Green Keelback, Buff-striped Keelback, Chameleon, Garden Lizard, Indian Bull Frog, India Baloon Frog, Indian Skipper Frog etc. are present in every corner of the sanctuary. Large number of species of non-chordates are also present here.

A large number of mammalian species are found in Phulwari sanctuary namely Leopard, Sloth Bear, Four-horned Antelope, Red Fox, Small Indian Civet, Toddy Cat, Jackal, Hyena, Jungle Cat, Common Langur, common Mongoose, Ruddy Mongoose, Pale Hedgehog, Hare, Five-Striped Palm Squirrel, Indian Pangolin, Flying Fox, Porcupine, Bush Rat, Large Brown Flying Squirrel, Gaint Wood Spider, Brown Whip Snake, Green Whip Snake, Common Tree Snake, Python, Green Keelback, Fat-

tailed Gecko, Termite Gecko, Millipede, Free-tailed Bat, Formic Ant and Sloth Bear are important species.

Three types of birds namely terrestrial, arboreal and aquatic are present in Phulwari. Baxa-Ka-Naka, Sawan Kyara Vasela, Janiwas and Wakal are important water-bodies of this sanctuary which sustain a good number of migratory and local water fowl. Aravalli Red Spurfowl, Grey Jungle Fowl, Painted partridge, Grey hornbill, Black-capped blackbird, Alexandrine Parakeet, Spotted Dove, Yellow-legged Green Pigeon, White-browed Fantail Flycatcher, White-throated Fantail Flycatcher, Crested Tree Swift, Thick-knee, Little Egret, Cattle Egret, Little cormorant, Small Kingfisher, Lesser Pied Kingfisher, Peafowl etc. are quite frequent here.

Python, Rat Snake, Buff-striped Keelback, Green Keelack, Red Sandboa, Russell's Sandboa, Trinket Snake, Blind Snake etc. are common non-venomous snakes of this sanctuary. Cobra, Saw-scaled Viper, Russell's Viper, Common Krait are four venomous snakes. Fresh water crocodile is also present in Wakal river. Starred Tortoise, Mud Flapshell, Common Monitor, Garden Lizard, Chameleon etc. are quite commonly observed. *Rana tigerina, R. limnocharis, R. breviceps, R. cyanophlictus, Bufo andersoni, B. melanoctistus, Microhyla ornata, Uperodonsystoma*are important amphibians here.

This sanctuary is very rich from non-chordates point of view. Giant Wood Spider, Tasar Moth, Moon Moth, Dragon flies, Bees, Potter wasp, Carpenter Bees, Butterflies, Beetles, Bugs, Earthworms, Leeches, Millipedes and many others live here. Wood spider patronise cool, fluvial streams. Tasar Silk moth prefer *Terminalia arjuna* zone. Moon moth likes Godal Patches.

2.4.2 Socio-cultural – local communities in and around the protected area

The Phulwari Ki Nal Wildlife Sanctuary is located near or around several villages within a few kilometers of its area of influence (Z.I.). These settlements are mainly populated by tribes such as Bhil, Garasia, and Bhil Meena, along with some presence of Rajput, Rebari, and Meghwal communities. Their lifestyle is closely tied to the resources available in the sanctuary. Their primary occupations include agriculture and livestock rearing, especially of goats and sheep. However, small landholdings and inadequate irrigation pressure them to depend on the sanctuary for grazing and limited timber resources.

This reliance leads to conflicts with the Forest Department, as restrictions on resource utilization in the sanctuary and slow processing of compensation claims for livestock losses due to wildlife create frustration among the villagers. Furthermore, crop damage from herbivores increases tensions. In spite of these difficulties, local communities display resilience and adaptability. Some have taken up alternative livelihoods such as eco-tourism and crafting, while others have engaged in conservation initiatives. By fostering partnerships between the Forest Department, NGOs, and local residents, it is possible to tackle these issues and encourage sustainable growth in the area.

2.4.3 Ecosystem services – rivers, lakes, habitat

Phulwari Ki Nal wildlife Sanctuary has a varied habitat. Diversified fauna and flora is present over here. The Sloth Bear, Leopard, Hyena, Jungle Cat, Four-horned Antelope, Chinkara, Crocodile, Grey Jungle

Fowl etc. are important faunal species present in this sanctuary. Phulwari ki Nal form catchment of many rivers and nallahs. The network *of* river system is the main characteristics *of* this sanctuary. The river Som originates from this sanctuary and flow down *to* western direction.Many tributaries originate from this sanctuary and feed water to Wakal river. The main source of water in the sanctuary is streams and nallahs. Though the Wakal River is not perennial but it has many gorges which provides water round the year. Few water springs like Katawali-wali-Jer also provides good water source to the wild fauna.

The Irrigation Department has constructed four dams in the vicinity of the sanctuary namely Baxa ka Naka, Savan Kyara, Hakarwa (Vasela) and Janiwas. They provide water facilities during pinch period i.e. summers, especially in interior areas. The Forest Department has taken up water harvesting construction works like check dams, R.R. check dams, anicuts etc. during last few years.

2.4.4 Connectivity/Linkages

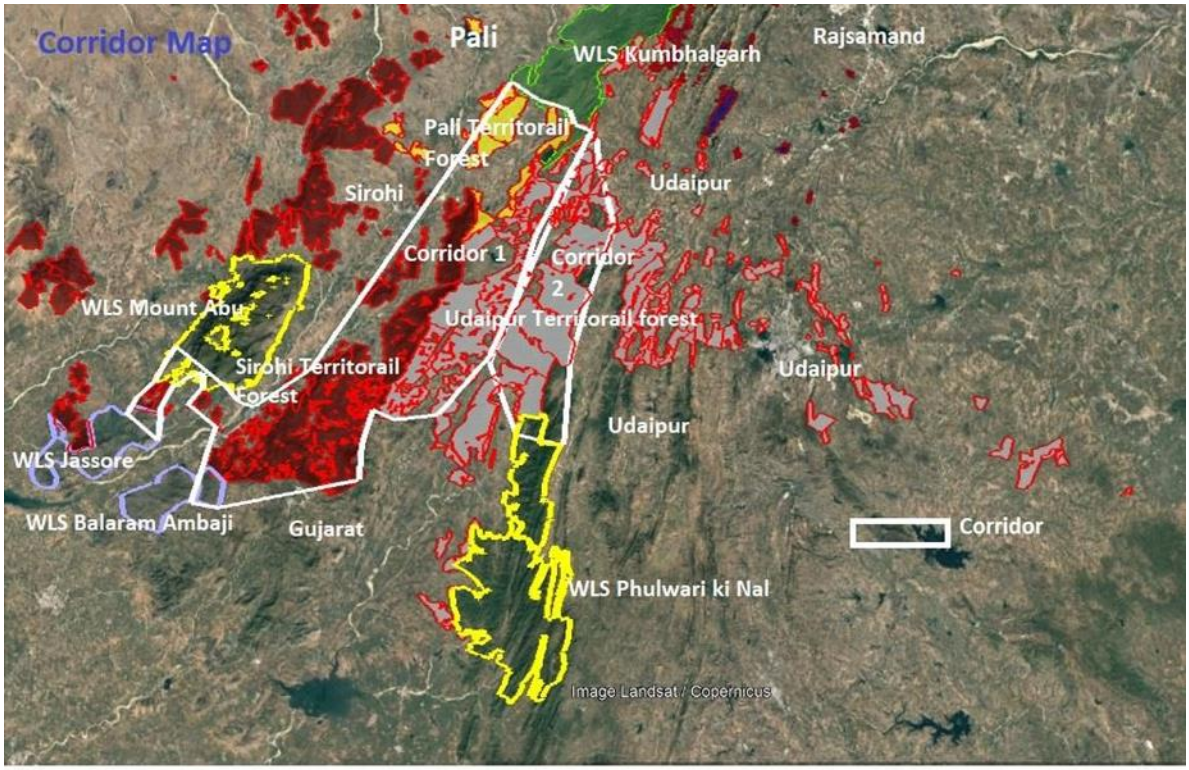
This sanctuary is encircled by forests that share similar climate and habitat conditions. To the north, the sanctuary's forests connect with the territorial forests of Ramkunda, Torna, and Ladan, among others. In the southern region, it continues with the forests of the Vijainagar Range located in Gujarat. To the east, the forests of Dhala and Som II are adjacent to the sanctuary. Likewise, on the western side, the territorial forests of Samoli and Merpur are also contiguous.

With the exception of the western side, the ecological boundaries in the remaining three directions integrate the sanctuary with the forests of Deloa, Gogunda, Ogna, Kotra, and Jhadol, which share a similar plant

composition. Towards the west, the Kotra range's forests are connected; however, as one moves further west, the environment becomes drier, and the vegetation shifts towards xerophytic types.

Agricultural fields are scattered throughout the sanctuary's forests, and a total of 134 villages are situated within its limits. The villagers' biotic influence significantly affects the sanctuary's management. The forest regions within the Udaipur (North) division serve as a corridor linking the Phulwari Ki Nal Wildlife Sanctuary with the southern area of Kumbhalgarh Wildlife Sanctuary. Furthermore, Udaipur's forest areas are connected to forest blocks in the Sirohi Division to the south. In turn, the Mount Abu Wildlife Sanctuary is linked with the Sirohi Division's forests. This landscape extends into Gujarat and incorporates the protected areas such as the Balaram Ambaji Wildlife Sanctuary, Jassore Sloth Bear Wildlife Sanctuary, and various territorial forest areas within it. Thus, the entire landscape stretching from the Todgarh-Raoli Wildlife Sanctuary in Rajasthan to the protected areas in Gujarat constitutes a crucial habitat for a diverse range of wildlife.

Map showing the Southern Aravalli Landscape and the corridors



2.5 APPROACH AND ACCESS

Phulwari Ki Nal Wild Life Sanctuary is situated 86Kms away from the tourist city Udaipur & the Wild Life Division Office Udaipur and is approachable by means of taxi, cars & buses. Nearest railway station is Udaipur City, the sanctuary at a distance of 88 Kms from here, whereas the nearest Maharana Pratap (Dabok) Airport, Udaipur is at a distance of 107 km form the sanctuary. From these places buses and Taxi cars are available to reach the sanctuary.

2.6 ATTRIBUTES OF THE PROTECTED AREA

2.6.1 Geology, Rock, and Soil

The sanctuary is a part of Aravalli range system. It is basalt in

composition and consist essentially of basic piegioclose, pysovene and accessories in the rocks. The trap is usually fine graind and dense. The colour is block and brown. At places amygloidal and angul cavities are filled with zeolite, calcite, chalcelony and its varieties. The trap is hard, tough and heat resistant.

The soil varies from clayey to clayey loam and to gravel depending upon topography. Black or gray, colour soil is found in patches lying upon the older formations. On slopes and plateaus the soil is mooram and unfertile. The depth of soil varies from 20 cm to few meters. Soil is mixed with pebbles and boulders.Generally all over the forest area, the soil is dry, rich in humus and is fertile.

2.6.2 TERRAIN CHARACTERISTICS

The tract is mainly hilly with interspersed network of streams, nallahs and rivers. The highest point is Harwa which is 980 m above MSL. The general slope of land is from North-East of South -West.The network *of* river system is the main characteristics *of* this sanctuary. The river Som originates from this sanctuary and flow down *to* western direction.Many tributaries originate from this sanctuary and feed water to Wakalriver.The topography of the area can be divided into steephills moderate hills, piedmont zones and plains. The hills have got a rugged topography. The plains down the hill are mostly agricultural fields. Area of Udaipur Districts is more hilly having steep slopes.

2.6.3 Climate

The climate *of* this area is sub-tropical, characterised by three distinct seasons as given in Table.

Three distinct seasons in the area

Season	Duration	Peak months
Summers	Mid March to Mid June	April-May
Rains	Mid June to September	July-August
Winters	October to mid March	December – January

2.6.4 Water Resources (Wetlands, river systems, drainage)

The sanctuary area mainly falls in the Aravalli hill ranges. Because of the shallow soil and its geo-morphological conditions, percolation of the rainwater is considerably low. Most of the nallahs dry up during the pinch period and water is available only at few points in the nallahs due to ground water seepage depending upon recharge during the rains. Moreover, frequent droughts in the region still worsen the conditions for wild life and local population.

Dams and anicuts constructed on them prove good water source to wild animals. As many as 42 wells/bawries and 156 anicuts are there inside the Sanctuary. Twelve small and medium dams are present in and around the sanctuary, which helps in water supply almost throughout the year. Sixty-three spots are there where natural water remains available either throughout the year or till late summers.

The main natural source of water supply is rainwater. There are many rivers and big nallahs in the sanctuary.

2.6.5 Forest Types and cover attributes

Phulwari Wildlife Sanctuary is confined to semi-arid zone of India. The forests of Phulwari sanctuary fall under “II Dry Tropical Forest” as per

Champion and Seth's classification of forest types. The following subtypes and groups along with their subsidiary edaphic types are also recognized.

Type 5 B- Northern Tropical Dry Deciduous forest.

Type C-2 Northern Dry mixed Deciduous forest.

The main tree species found are Haldu, Mahua, Anwla, Gurjan, Dhaora, Salar, Tendu, Khirni, Karanj, Umbia, Bahera, Arjun, Aam, Karpata, Bad, Khajur, etc. and Bamboo in undergrowth. The average density is 0.3 to 0.8. The average height is 5 to 11 mts. The bamboo grows abundantly. The growth and regeneration is excellent. The natural regeneration of all species are generally profuse and abundant.

Along the water courses, due to better availability of moisture, special micro climate has been formed in pockets. Tall evergreen trees occur at such places with dense undergrowth. The Mango, Rohini, Mahuwa, Kohra, Karonda, Bargad, Salix etc. are usually found which provide ideal condition both for food and shelter to a large variety of wild animals.

The area in rich is Pteridophytes, Bryophytes and Thalophytes. *Centella asiatica, Ensetesuperbum*, *Jasminum grandiflorum, Dalbergia voulubilis,* orchids like *Vanda* and *Aeride*setc. are special element of this sanctuary. There is a need for detailed study of biota of this sanctuary to unearth several unreported life forms.

Khajur is a riverine species in this area and sometime make pure stands. It is found is abundance and is branched at some places which is a rare phenomenon. Another rare feature is presence of yellow flowered khakra (*Butea monosperma var. lutea*) at some places. Many rare plant species like *Venda tessilata, Aeridesmaculosum, Habanriafurcifera, H.*

plantaginea, Nerviliaaragona, Costus speciosus, Hiptage benghalensis, Argyreiastrigosa, Zinia elegans, Sauromaticum venosum, Ougeniaoojensis, Ampelopterusprolifera, Acampepremorsa, Eulopheaochreata etc. are in distribution in this sanctuary (Plate II and III).

2.7 Land Use Land Cover (LULC)

Assessment of the degradation of forest cover by Remote Sensing and GIS (Geographical Information System) technique of the Sanctuary is the main aim of the present investigation. Anthropogenic activities in the study area are so intense that forest cover is degrading at an alarming rate. Supervised classification methodology has been employed using maximum likelihood technique in ERDAS Imagine 14.0. The images of the maps were classified into Forestland, scrubland, water and barren land. The statistical analysis indicates change in land use pattern from the year 2001 to 2005 and till 2015. And this change in land use pattern is of great concern for environmentalists and this leading to the habitat loss to the endemic flora and fauna species. This scientific venture gives a vivid picture of the forest degradation due to human activities which has to be checked immediately to save the forest land and the sanctuary as well.

2.8 BIOGEOGRAPHIC INFORMATION

Phulwari Wildlife Sanctuary has good vegetation cover. Different types of habitats are available in this sanctuary which meet out ecological, biological and ethological requirements of different life forms. Different animals prefer different types of habitat for food and shelter. Panther is at the peak of ecological pyramid. Tigers, Sambars and Chinkara were found till late sixties. Sloth Bear is also an important species confined to

this PA. Sloth Bear uses wild fruits, honey, flowers and underground parts of many plant species as its food. The fruits of *Diospyros melanoxylon, Ficus glomerata, Phoenix sylvestris* and flowers of Madhuca latifolia are favorite food for sloth bear in this PA. It devour fruits of *Cassia fistula* also. The sloth bear needs wooded and unapproachable sites for shelter. The forest areas of Daiya, Ambasa, Phulwari ki Nal, Devli, Harva, Dhedmariya etc. form an ideal habitat for sloth bear. Bijphadia, a locality in Daiya area is well known for sloth bears. During season of Mahuwa flowering, Sloth bears can be seen in foothill zones also.

Flying squirrel, a recently reported animal species of this sanctuary in mainly confined where density of Mahua tree is high. This species lives in hollows of old trees and like new shoots of Mahuwa tree for food.

Panther is an apex species of this sanctuary which needs wooded and shrubby area. Fairly good population of panthers exist in this sanctuary. Panthers quite often invade and kill the domestic live stock to fulfil their food requirements.

Jackals and Hyenas are also found living co-existingly in similar habitat condition. Common Mongoose and Ruddy Mongoose are also present in the Sanctuary.

This sanctuary is also rich in bird life. The Grey Jungle fowl and Aravalli Red Spurfowl is confined in interior areas where bushy thicket is available. A variety of arboreal, terrestrial and aquatic birds are present here. Wakal, a prominent river of the sanctuary is full of aquatic birds and other life forms including crocodile. Crocodiles of this sanctuary are very cryptic, broadly nocturnal, live in dens made by them in riverbank or in the space present below huge rocks.

Herpetofauna is rich here. Green Whip Snake, Python, Rat Snake, Cobra, Green Keelback, Buff-striped Keelback, Chameleon, Garden Lizard, Indian Bull Frog, India Baloon Frog, Indian Skipper Frog etc. are present in every corner of the sanctuary. Large number of species of non-chordates are also present here.

As per the IUCN classification, several species of global importance are found in the Phulwari sanctuary, which needs suitable concrete actions to protect them against the threats of extinction. Though few listed species are common at present in this sanctuary. A list of such species and their IUCN category is given in Table.

List of IUCN category of certain animals of Phulwari

S. No.	Scientific name	Family	IUCN category	Distribution
1.	*Anogeisus serecea*	Combretaceae	Intermediate	Foothills (Panarwa range)
2.	*Chlorophytum borivilianum*	Liliaceae	Rare	Whole Sanctuary area
3.	*Commiphora wightii*	Burseracese	Intermediate (Red-data species)	Present in degraded out skirts
4.	*Gloriosa superba*	Liliaceae	Rare (Common in sanctuary)	Dharawan and foothills
5.	*Phoenix sylvestris*	Palmae	Threatened (Common in sanctuary)	Along river and low laying area
6.	*Sterculia urens*	Sterculiaceae	Threatened	Dotted in sanctuary

7.	*Tecomella undulata*	Bignoniaeae	Rare	Few trees are present near western ouskirts6 of sanctuary

Apart form above mentioned species, there are certain other key species which are of special conservation significance like *Ensetesuperbum, Butea monosperma*var. *lutea, Gmelina arborea, Aegle marmelos, Erythrina suberosa, Santalum album* etc.

Species and plant communities of conservation importance; Key Area

Heavy biotic pressure and excessive grazing during the past and recent years has resulted in reduced regeneration of some vital species leading to low bio diversity. The slow growing and non-coppicing species including medicinal herbs have been worst affected. Although after declaration of sanctuary they have started regenerating again but still these vital species need effective protection & propagation measures. The excessive grazing specially by goats and sheep have resulted in wiping out the important natural species resulting in spread of monocultures species likejuliflora& lantana. floral species that have become rare are listed below**:**

1. Sterculia urens - Scattered trees are observed. Lack of regeneration is the cause of its loss.
2. Commiphora wightii- Dotted plants can be seen in the sanctuary area.
3. Toona ciliata -Few trees present in the nallahs toward upper reaches.
4. Caesalpinia decapatela- Mainly confined to upper reaches.

5. Jasminum grandiflorum- Confined to patches along ThandiberiRanakankar part.

Apart from above species, some plant communities need conservation efforts. Bridelia retusa, Capparis grandiflora, Madhuca indica are species of special conservative significance.

Animals and Habitats

Vertebrates:

A large number of mammalian species are found in Phulwari sanctuary namely Leopard, Sloth Bear, Four-horned Antelope, Red Fox, Small Indian Civet, Toddy Cat, Jackal, Hyena, Jungle Cat, Common Langur, common Mongoose, Ruddy Mongoose, Pale Hedgehog, Hare, Five-Striped Palm Squirrel, Indian Pangolin, Flying Fox, Porcupine, Bush Rat, Large Brown Flying Squirrel, Brown Whip Snake, Green Whip Snake, Common Tree Snake, Python, Green Keelback, Fat-tailed Gecko, Termite Gecko, Millipede, Free-tailed Bat, and Sloth Bear are important species.

Status, distribution and habitat of major mammals:

Panther:

After local extinction of Tiger (in sixties), now Panther is enjoying the status of apex species. Panthers are present in the whole sanctuary and in surrounding forest areas of Ramkunda, Ladan, Samoli, Som, Adiwas etc. In absence of perfect food chain it often moves to agricultural fields and human habitations in search of food.

Sloth bear:

Sloth bear is another important species, which is in a good number in

this P A, especially in Daiya-Ambasa area. Sloth bear is mainly confined in those areas where trees of Timru, Mahuwa, Ber and Gular are more in number. Almost every Gular tree in Daiya-Ambasa has claw-marks on it bark.

Striped hyena:

This is a nocturnal scavenger species. It feeds on dead cattle and left out portions of the kills of panther.

Four-horned antelope:

It is a shy herbivorous animal, which likes to live in plant cover. It is locally called *Bhedal*. A small population of Bhedal is present here.

Large brown flying squirrel:

This species has been recently reported from this sanctuary. Flying squirrel is a southern element and Phulwari is probably its northern most limit. It lives in hollows of old trees. It is a nocturnal species, which is present in a good number in the Protected Areas.

Bird:

Three types of birds namely terrestrial, arboreal and aquatic are present in Phulwari. Baxa-Ka-Naka, Sawan Kyara Vasela, Janiwas and Wakal are important water-bodies of this sanctuary which sustain a good number of migratory and local water fowl. Aravalli Red Spurfowl, Grey Jungle Fowl, Painted partridge, Grey hornbill, Black-capped blackbird, Alexandrine Parakeet, Spotted Dove, Yellow-legged Green Pigeon, White-browed Fantail Flycatcher, White-throated Fantail Flycatcher, Crested Tree Swift, Thick-knee, Little Egret, Cattle Egret, Little

cormorant, Small Kingfisher, Lesser Pied Kingfisher, Peafowl etc. are quite frequent here.

Many bird species found in this sanctuary are listed in the IUCN Red-data book and ZSI Red-data Book is given in Table 2.3 & 2.4 respectively.

Table 2.3

IUCN Red-data birds of Phulwari.

S. No.	Common Name	Latin Name	Category
1.	Red Spurfowl	*Galloperdixspadicea*	Endangered
2.	Grey Junglefowl	*Gallus sonneratii*	Near threatened
3.	White-bellied Minivet	*Pericrocotuserthropygus*	Near threatened
4.	Indian Black Ibis	*Psendibispapillosa*	Near threatened
5.	Painted Stork	*Mycteria leucocephala*	Vulnerable
6.	White-winged Black Tit	*Parus nuchalis*	Vulnerable
7.	Asian Openbill	*Anastomusoscitans*	Vulnerable
8.	White-backed Vulture	*Gyps bengalensis*	Vulnerable
9.	King Vulture	*G. calvus*	Vulnerable
10.	Red-necked Falcon	*Falco chicquera*	Vulnerable

Table 2.4

ZSI Red-data birds of Phulwari

S. No.	Common Name	Latin Name	Category

1.	Spoonbill	*Platelialeucorodia*	Threatened
2.	Osprey	*Pandion haliaetus*	Threatened
3.	Common Peafowl	*Pavo cristatus*	Threatened

Reptiles:

Python, Rat Snake, Buff-striped Keelback, Green Keelack, Red Sandboa, Russell's Sandboa, Trinket Snake, Blind Snake etc. are common non-venomous snakes of this sanctuary. Cobra, Saw-scaled Viper, Russell's Viper, Common Krait are four venomous snakes. Fresh water crocodile is also present in Wakal river. Starred Tortoise, Mud Flapshell, Common Monitor, Garden Lizard, Chameleon etc. are quite commonly observed.

Amphibians:

*Rana tigerina, R. limnocharis, R. breviceps, R. cyanophlictus, Bufo andersoni, B. melanoctistus, Microhyla ornata, Uperodonsystoma*are important amphibians here.

Limiting factors:

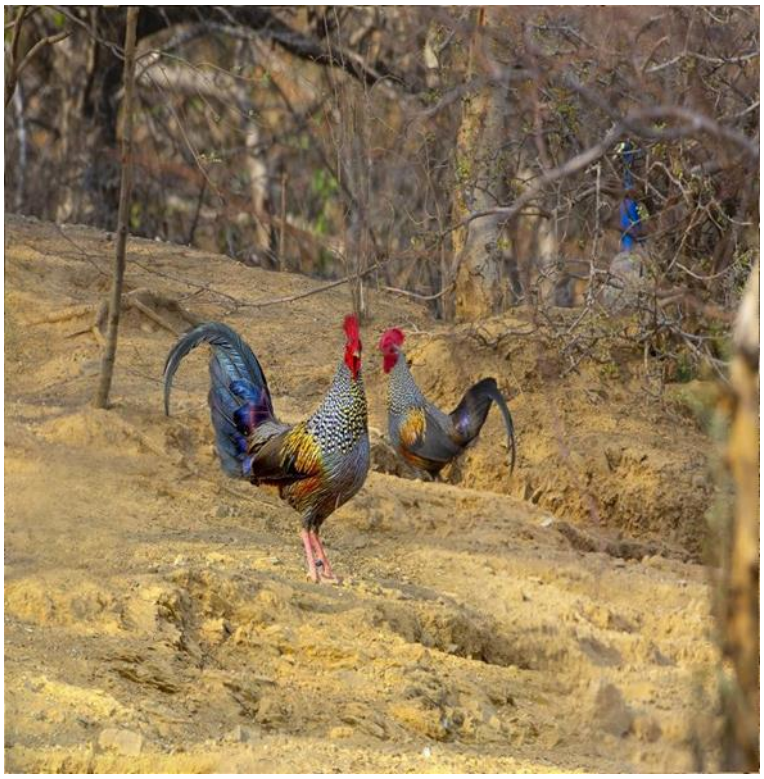
Excessive biotic pressure from a large number of villages situated inside and at out skirts of sanctuary result in habitat loss. Frequent droughts, low number of herbivores, fire hazard, harvesting of water from Wakal river in Upstream zone for agriculture, pilferage of Bamboo at border zone and practice of encroachment on forest land are the major limiting factors for wildlife of the area.

LEPORD

SLOTH BEAR

PENGOLIN

BLUE BULL



GREY JUNGLE FOWL

INDIAN BLACK BIRD

JUNGLE NIGHTJAR

IMPORTANT INVERTEBRATES THERE

STATUS DISTRIBUTION AND HABITAT

There are more than 20 invertebrates present in the Phulwari Ki Nal Wild life sanctuary. Out of these julussp and fresh water crab (paratelphusajacquemontii) are rare. Rest of them are either common or is in abundance.

The list of invertebrates is as follows.

S.no	Hindi Name	Local Name	Latin Name	Status Abundant / Common / Less Common / Rare
1	Madhu makhi	Bhanwar	Apis dorsata	Abundant
2	Madhu makhi	Bhanwar	Apis indica	Abundant
3		Tanni	Cicada sps.	Abundant
4	Kenchua	Alsiya	Pheritemaposthumas	Common
5			Neocerambyxparis	Rare
6			Mantis sps	Common
7	Gobar ka Gubrella	Gobar ka Gubrella	Onthophagus Sagittarius	Common
8	Gharmela Bada	Gharmela Bada	Julus sp.	Rare
9	Kante ka Kida	Kante ka Kida	Clania sp.	Common
10	Titili	Titili	Melanitisleda	Common
11	Titili	Titili	Terias hecaba	Common
12	Titili	Titili	Junoniaorithya	Common
13	Titili	Titili	Euploea core	Common
14	Titili	Titili	Vanessa carduri	Common
15	Titili	Titili	Papilio polytes	Common

16	Titili	Titili	Argema Selena	Common
17	Rashem ki Titli	Mewar ki dokri	Anthera Mylitta	Common
18	Zebra makdi	Kolan	Plexippus paykully	Common
19	Aakere ka Tidda	Tidda	Poecilocruspictos	Very Common
20	Kenkra	Katla	Paratephusajacquemonti	Rare

2.9ECOSYSTEM SERVICES IN THE PA

Phulwari Ki Nal Wildlife Sanctuary plays an essential role in providing various ecosystem services that benefit the local community as well as the wider region. These services include the conservation of biodiversity, water resource management, carbon absorption, soil protection, climate regulation, and opportunities for leisure and tourism, alongside cultural and spiritual significance. The sanctuary boasts a diverse array of flora and fauna, including endangered species such as the Indian leopard, sloth bear, and four-horned antelope, which are vital for preserving genetic diversity and ecological equilibrium. Acting as a catchment area for several rivers, the sanctuary aids in regulating water flow, preventing soil erosion, and replenishing groundwater, thereby ensuring a steady water supply for local residents and agricultural needs. The forested areas within the sanctuary absorb carbon dioxide, contributing to the fight against climate change and improving air quality. Furthermore, these woodlands mitigate soil erosion, protecting fertile topsoil and reducing sedimentation in water bodies, which is crucial for sustaining agricultural productivity and lowering flood risks.

The sanctuary's forests also influence both local and regional climate conditions by providing shade, reducing wind speed, and regulating temperatures, thus creating a more favorable environment for both people and wildlife. Additionally, the sanctuary's breathtaking landscapes, historical sites, and diverse wildlife attract tourists, supporting local economies and encouraging recreational activities such as trekking, wildlife watching, and camping. The cultural and spiritual aspects of the sanctuary hold great significance for local residents and visitors alike.

2.10SOCIO-ECONOMIC AND SOCIO-CULTURAL PROFILE

The region around the Phulwari Ki Nal Wildlife Sanctuary is predominantly populated by rural communities that heavily depend on natural resources. The local demographics are largely made up of tribal groups like the Bhil, Garasia, and Bhil Meena, whose traditional ways of life center around agriculture, animal husbandry, and forest-related activities. The socio-cultural landscape is rich in traditional knowledge and practices regarding the management of natural resources, which have been passed down through generations. However, the area faces challenges such as poverty, limited access to education and healthcare, and dependence on subsistence farming. These circumstances can result in the over-exploitation of resources and lead to conflicts with wildlife conservation efforts.

Demographic profile

The demographic profile of the area surrounding Phulwari Ki Nal Wildlife Sanctuary reveals a varied and largely rural population that

maintains a close connection to the local natural environment. Within a 5-kilometer area, the inhabitants include various ethnic groups, with the Bhil, Garasia, and Bhil Meena tribes being the most significant. These tribal communities have a deep-rooted association with the forest, relying on its resources for their means of livelihood. Other ethnic groups, such as Rajputs, Rebari, and Meghwal, also inhabit the region in considerable numbers, contributing to the area's cultural richness. The social and cultural structures of these communities tend to be similar, with shared traditions, customs, and religious practices. The veneration of plants (phytolatry) and animals (zoolatry) is prevalent among these groups, highlighting their profound reverence for the natural world. Religious customs often center around "Deoras," which are revered sites usually located at village peripheries or near forested hills, serving as spiritual hubs for the local tribes.

Traditional use and indigenous knowledge

The indigenous peoples in the Phulwari Ki Nal area have extensive traditional wisdom regarding the local ecosystem, its resources, and practices for sustainable management. This wisdom includes the identification of plant and animal species, methods for sustainable resource use, an understanding of ecological principles, and cultural and spiritual relationships. Combining traditional knowledge with contemporary conservation initiatives can lead to more effective and culturally aware management approaches. For instance, practices such as rotational grazing and selective tree cutting can help maintain resource viability over the long term, while insights into ecological

interactions can inform the development of sustainable land-use strategies.

Inventory of available data

An extensive compilation of available data is crucial for sound decision-making and efficient management of the Phulwari Ki Nal Wildlife Sanctuary. This compilation ought to encompass information from diverse sources, including government bodies, non-governmental organizations (NGOs), academic entities, local populations, and collaborative data gathering. Government agencies can supply information on wildlife population counts, alterations in forest coverage, and management efforts. NGOs might have performed studies on biodiversity, community livelihoods, and conservation projects. Academic institutions can offer research articles, theses, and dissertations associated with the sanctuary's ecology, biodiversity, and socio-economic factors. Local communities can provide valuable traditional knowledge and insights regarding wildlife, plant species, and environmental changes. Methods of participatory data collection such as interviews, focus groups, and participatory mapping can yield important perspectives on local views, requirements, and practices. This compilation can be structured into a database or knowledge management system to facilitate easy access and analysis.

Existing Documentation and Dissemination efforts

The Phulwari Ki Nal Wildlife Sanctuary probably has some form of documentation and outreach initiatives, such as management plans, yearly reports, research articles, public awareness resources, and various

dissemination methods. Nevertheless, the success of these initiatives may differ, and there might be a need for enhanced documentation and outreach strategies to connect with a broader audience and improve information sharing.

Existing local narratives and toolkits (Participatory Rural Appraisal, Multi- stakeholder dialogues, and knowledge exchange plat forms)

Local stories and traditional knowledge offer essential perspectives on the history, culture, and ecological awareness of the Kotda region. These stories can be captured through oral histories, folklore, and traditional customs. Participatory rural appraisal (PRA) toolkits and multi-stakeholder discussions can be employed to foster effective engagement with local communities, identify their priorities, build consensus, and share knowledge. By integrating local stories and using participatory methods, the Phulwari Ki Nal Wildlife Sanctuary can enhance its relationship with local communities and create more inclusive and sustainable management strategies.

Landuses–past and present

The land utilization in the area surrounding Phulwari Ki Nal Wildlife Sanctuary has traditionally been characterized by farming and livestock rearing, with communities relying significantly on the forest for resources like grazing, fodder, and minor timber. Historically, local tribal communities engaged in subsistence agriculture on small plots and raised animals, especially goats and sheep, which were greatly reliant on grazing in the forest. As the population expanded and farming techniques became more intensive, the strain on the land increased.

Limited irrigation infrastructure and poor soil quality hindered agricultural output, which prompted additional encroachment into forested areas for farming. Recently, a trend of migration to urban centers for job opportunities has emerged, somewhat alleviating direct pressure on the land; however, the overall dependence on forest resources continues to be substantial. Efforts to conserve natural habitats and regulations on forest access have shifted land use practices, yet the challenge of finding a balance between environmental conservation and the economic needs of local communities remains unresolved.

Resource dependency of communities such as minor forest produces collection

Farming is characterized by its seasonal nature and does not offer jobs all year round. Workers can find employment for about six months annually, while during the remaining six months of unemployment, they tend to engage in cattle raising and labor-intensive activities. The relationship between tribal communities and forests is noteworthy. They rely completely on forests for constructing their homes, sourcing fencing supplies, obtaining fodder, and acquiring small timber for their farming tools.

Peoples Biodiversity Register

People's biodiversity register is prepared.

Local biological/natural resources

The Phulwari Ki Nal Wildlife Sanctuary and its adjacent regions are abundant in local biological and natural resources, which are vital for the livelihoods of the nearby communities. The thick forests offer a

range of timber and non-timber forest products, such as small wooden items, fodder, fuelwood, and medicinal herbs. These resources are crucial for the everyday needs of the local residents, especially the tribal populations who have traditionally relied on the forest for building materials, farming tools, and traditional medicine. Although water resources are scarce, they remain an important natural asset, with streams and small reservoirs serving both human and animal populations. However, the rising pressure from human activities and livestock on these natural resources has resulted in considerable environmental issues, including forest degradation and soil erosion.

2.11 PERIPHERAL LAND USES

2.11.1Stakeholders in the landscape and forest resource dependency

The population around the sanctuary area is mainly agriculturist, pastoralist and labour class, depending upon the natural resources of the sanctuary for grasses and to some extent for small wood. Based on these facts, the zone of influence of wild life sanctuary is tentatively identified up to 5 km from boundaries of eastern, western, northern and southern side of sanctuary.

2.11.2Major Production Sectors, intensive land uses within the landscape

The key production sectors within the area surrounding Phulwari Ki Nal Wildlife Sanctuary are mainly agriculture and livestock farming. Agriculture is the primary land use in this region, with most families involved in farming small plots. Commonly cultivated crops include

maize, wheat, and pulses, although agricultural yields are often hindered by difficult terrain and inconsistent soil quality.

Livestock farming also plays an important role, particularly the raising of goats and sheep, which are essential for the livelihoods of communities such as the Rabari. These animals are typically grazed on private property as well as in adjacent forested regions, supporting the local economy through the production of milk, meat, and wool. Moreover, some areas have experienced the emergence of horticulture, with villagers increasingly growing vegetables and fruits. However, the absence of structured marketing channels means that much of this produce is sold at low prices to intermediaries.

In summary, the landscape is heavily utilized for agriculture and livestock farming, which are the main income sources for the local community. While these activities are vital for sustaining livelihoods, they also exert considerable pressure on the land and natural resources in the area.

2.11.3 Eco-sensitive zone

Details of Eco-sensitive Zone is given in Part –B of Management Plan.

2.11.4Socio-Economic Profile of villages in the zone of influence

The socio-economic characteristics of the villages within the influence zone surrounding Phulwari Ki Nal Wildlife Sanctuary depict a primarily rural and agricultural community, where the livelihoods of local residents are closely linked to the land and forest resources. This area is inhabited by a variety of ethnic groups, with the Bhil, Garasia, and Bhil

Meena tribes comprising the majority of the population. These tribes have a longstanding history of coexisting with the forest, depending on its resources for their survival and cultural traditions. Other groups such as Rajputs, Rebari, Meghwal, and Mahajans are also present in the region, each enhancing the socio-economic landscape of the area.

Agriculture serves as the main source of livelihood for most households, with average landholdings between 1 to 1.5 hectares. The region's terrain and soil conditions are typically subpar, resulting in low agricultural output, which compels many families to seek additional sources of income. Animal husbandry, particularly the raising of goats and sheep, is a crucial economic activity, especially for the Rabari community. These animals largely depend on the forest for grazing, thereby exerting significant pressure on the sanctuary's resources. The increasing demand for milk in nearby towns such as Udaipur, Kotda, Panarwa, Kumbhalgarh, Gogunda, and Sayra further intensifies the need for livestock, heightening reliance on forest grazing areas.

The economic situation in these villages is difficult, with a significant number of individuals categorized as marginal farmers or landless laborers. Due to the lack of year-round employment opportunities in agriculture, many men from these communities migrate to cities like Surat, Mumbai, and Ahmedabad in pursuit of better job prospects. This trend of migration has become more widespread, as the younger generation seeks work in construction, services, or various industries in urban areas. While this migration alleviates some immediate pressure on local resources, it also transforms the traditional socio-economic structure of the villages.

Access to education and healthcare within the influence zone is slowly improving, attributed to a range of government initiatives. Schools have

been set up in several villages, leading to increased literacy rates among younger individuals. Health programs, including "Swachh Bharat Abhiyan" and "Mukhyamantri Chiranjeevi Swasthya Yojana," have been rolled out to improve health and sanitation conditions in the area. Nonetheless, these advancements are inconsistent, and many remote regions still experience insufficient infrastructure and services.

The economic framework of the villages continues to heavily depend on natural resources, especially those sourced from the forest. This dependence encompasses the collection of fodder, firewood, and minor timber, along with using forest land for grazing. The limited land holdings and unsatisfactory agricultural production often drive villagers to encroach upon forest areas, which aggravates environmental harm. This persistent strain on the sanctuary's resources poses challenges for conservation efforts, as the need to reconcile ecological preservation with the local population's socio-economic requirements becomes increasingly pressing.

In conclusion, the socio-economic landscape of the villages surrounding Phulwari Ki Nal Wildlife Sanctuary is marked by a strong dependence on agriculture, animal husbandry, and forest resources, alongside an increase in migration to urban settings for work. Although there have been strides in education and healthcare, the economy of the region remains delicate, heavily reliant on the natural environment, and susceptible to shifts in land use and conservation strategies.

2.11.5Major Infrastructure and mitigations therein

Phulwari Ki Nal Wildlife Sanctuary, being a protected area, has limited infrastructure development to minimize its impact on the fragile

ecosystem. However, some existing infrastructure within and around the sanctuary includes:

- **Roads:** The sanctuary is connected by roads to nearby towns and villages, facilitating access for visitors and management staff. However, these roads can pose risks to wildlife through collisions and habitat fragmentation. Mitigation measures include:
    I. Constructing wildlife underpasses or overpasses to allow safe crossings.
    II. Reducing vehicle speeds in sensitive areas.
    III. Promoting eco-friendly modes of transportation for visitors.
- **Watchtowers:** Some watchtowers are located within the sanctuary, providing vantage points for wildlife observation and monitoring. These towers can be used for habitat surveillance, fire detection, and anti-poaching activities.
- **Rest Houses:** There is a rest houses and tourist facilities within the sanctuary known as Panarwa, catering to visitors and researchers. These facilities should be designed and managed to minimize their impact on the environment.

2.11.6 Forthcoming major projects/land use change

There is no major project Proposed in Management Plan Area.

2.11.7 Status of corridor linkages

The Southern Aravalli corridor, stretching across Rajasthan and Gujarat, presents a complex picture of connectivity. While the landscape offers a

semblance of continuity, human activities, such as settlements, agriculture, and infrastructure development, have fragmented the corridor in certain areas. This fragmentation poses significant challenges to wildlife movement and gene flow. Despite these challenges, the corridor boasts several important protected areas, including Phulwari Ki Nal, Kumbhalgarh and Todgarh-Raoli Wildlife Sanctuaries, which serve as vital refuges for wildlife. However, the effectiveness of these sanctuaries in maintaining connectivity depends on their size, location, and the quality of their surrounding habitats. To enhance corridor linkage, efforts are needed to restore degraded areas, establish wildlife corridors, and promote sustainable land use practices.

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CHAPTER-3
HISTORY OF PAST MANAGEMENT AND PRESENT PRACTICES

3.1 MANAGEMENT HISTORY

Conservation History

The Phulwari Ki Nal sanctuary is managed by the Wildlife Division of Udaipur and is located in the southern part of the Aravallis. This sanctuary includes forests from the former "Bhomat States" as well as hunting grounds of Rana Panarwa, Rao Daiya, Rao Juda, and Rao Mahadi. It was once teeming with wildlife prior to independence and was particularly noted for its population of Tigers, Sloth Bears, Panthers, Sambars, Four-horned Antelopes, and others. However, over time, species such as Tigers, Sambars, and Otters have vanished from the area.

The sanctuary hosts a variety of naturally occurring flowering plants, which is why it is aptly named Phulwari, meaning the home of flowers. It also features fruit-bearing plants like Jamun, Mango, Amla, Karonda, Sitaphal, Mahuwa, Timru, as well as medicinal plants such as Centella asiatica, Bacopa monnieri, Chlorophytum barivillianum, and Eulophiaochreata. The region experienced significant exploitation for resources such as Bamboos, Timru leaves, firewood, charcoal, and Katha, all sourced not only by contractors but also by the State Trading wing of the department until the management of the sanctuary was

assigned to the Wildlife Wing. During this time, non-timber forest products (N.T.F.P.) were also collected through contractors.

The initial management plan for the sanctuary was developed following the transfer of administrative control to the wildlife divisions. This plan was specifically created to focus on wildlife welfare and habitat conservation, and it ran from 1990-91 to 1994-95. A second plan was drafted for the period from 1996-97 to 2000-2001, emphasizing habitat enhancement and infrastructure development. However, there was limited progress in areas like eco-development, fauna rehabilitation, and eco-tourism, primarily due to financial limitations.

Conservation Strategies employed

The official recognition of the area as Phulwari Ki Nal Wildlife Sanctuary in 1983, along with the establishment of the Wildlife (Protection) Act in 1972, represented a major conservation initiative for the region. A systematic development strategy for the sanctuary began in 1984-85 when it was incorporated into the list of centrally sponsored schemes and received government funding for infrastructure enhancements. Ongoing management strategies have been executed since then, with the latest plan covering the years 2012-13 to 2022-23, and a new plan suggested for 2023-24 to 2032-33. These strategies focused on developing infrastructure, managing invasive species, improving water management, and tackling the issues related to the non-regeneration of species at higher altitudes.

Forestry Management Practices ; Historic & Present

Management practices in the Phulwari Ki Nal Wildlife Sanctuary have progressed notably over time. The original emphasis was on the preservation and restoration of the forest cover. Timber operations were limited, and the collection of resources such as bamboo and firewood was strictly regulated. Once the area was designated as a sanctuary, all resource extraction activities were prohibited, resulting in a natural revival of both vegetation and wildlife. There have also been initiatives to eliminate invasive species like Prosopis juliflora and Lantana camara to enhance the habitat for indigenous plants and animals.

In recent years, the focus of management has shifted towards improving the uneven-aged forest system, which reflects successful regeneration in certain sections of the sanctuary. Nonetheless, challenges persist, including managing the overgrazing by herbivores and domestic livestock, which has led to uniform crop patterns in some locations. Current efforts aim to tackle these challenges via selective forest canopy openings and the reintroduction of species such as antelopes to sustain ecological equilibrium.

Socio-cultural Dynamics Within Landscape and its Management

The socio-cultural interactions in the Phulwari Ki Nal Wildlife Sanctuary area have significantly influenced the approaches to its management. Surrounding the sanctuary are various villages primarily populated by tribal communities, who have historically relied on the forest for their livelihoods. Before the sanctuary was established, these communities had the right to gather firewood, grass, and other forest products, but these rights were later restricted to safeguard the area's biodiversity.

Following the relaxation of these restrictions after independence, there has been a rise in unlawful activities, such as poaching, logging, and grazing. The enactment of the Forest Rights Act (FRA) in 2006, which provided land rights to forest dwellers, has made the sanctuary's management even more challenging. The allocation of these rights has resulted in increased occurrences of fire, grazing, and encroachment within the sanctuary, necessitating targeted management efforts to mitigate further damage. Sanctuary management has had to reconcile the needs of local communities with conservation objectives, engaging residents in activities such as grass collection to avoid the development of grass beds that obstruct seed regeneration.

3.2 HABITAT MANAGEMENT AND PROTECTION

The Phulwari Ki Nal Wildlife Sanctuary has implemented various habitat management and protection strategies over the years to ensure the sustainability of its ecosystems and the preservation of its wildlife. The management practices have evolved to address the unique challenges posed by the sanctuary's landscape, species composition, and human interactions.

Habitat Management Regimes

The habitat management regimes in Phulwari Ki Nal Wildlife Sanctuary focus on maintaining and enhancing the ecological health of the area. These include a range of practices aimed at preserving forest cover, preventing illegal activities, and ensuring natural regeneration of species.

Timber Operations Including Bamboo & Firewood Harvesting

No activities involving feelings are allowed since the sanctuary was established. Right holders can collect dead and dried firewood and grass without any cost. Grazing is permissible in the open forests, but camping is not allowed. However, in accordance with the Supreme Court's ruling, removing any forest produce from the Protected Area is prohibited. Clarification on the villagers' settlement rights regarding forest produce and patta tendu extraction is still awaited from higher authorities in light of this ruling.

After the sanctuary was established, all such activities were halted, leading to the recovery of vegetation and the reappearance of native wildlife. In accordance with the Supreme Court's ruling dated 14.02.2000 (I.A No 548), the extraction of dead, dying, or diseased trees, as well as grass, from any National Park or Sanctuary is completely forbidden.

Silvicultural Systems and Tending Operations

Currently, there is no timber extraction or collection of other forest resources taking place. The removal of undesirable weeds occurs when budget constraints permit. The sanctuary is significantly affected by invasive species like Prosopis juliflora and Lantana camara, which must be eliminated to enhance habitat quality. Important silvicultural techniques such as weeding, hoeing, and pruning should be applied in areas where plantations have been established for habitat enhancement. Cutback and singling methods are advisable in regions with thick growths of species like Anogeissus latifolia, Ziziphus mauritiana, and Wrightia tinctoria. Furthermore, ring trenches can be excavated around trees such as Salar, Neem, Pallas, and Belpatra to help retain soil moisture and shield them from grazing animals.

Ongoing Management Practices

The ongoing management practices at Phulwari Ki Nal Wildlife Sanctuary are centered around protecting and maintaining the sanctuary's ecosystems, ensuring the safety and sustainability of its wildlife, and addressing the challenges posed by human activities. These practices include legal protection measures, controlling illegal activities, and addressing issues such as grazing, wildfires, and interagency coordination.

- **Legal Status**

There are 11 forest blocks in the sanctuary comprising an area of 511.41 sq km. It was declared as 'Phulwari wildlife sanctuary" by Government of Rajasthan notification no. F/ 11/1/8/83.Dated 6th June, 1983. The legal status of the forest area of the sanctuary is given in Table 3.1.

Table 3.1
Legal status of forest area of Phulwari Sanctuary

S. No.	Legal Status	Area (Sq km.)
1.	Reserve forests	365.92
2.	Protected forests	145.49
	Total area	511.41

The rights and privileges in the reserved forest area have already been decided. Final notifications of all the forest blocks have been issued by the Govt. of Rajasthan. So far preliminary notification of the block Phulwari is issued vide no. F- 34 *(200)* perf. 43-12188 dated 2nd Feb. 1954. The final notification of the R.F. block Phulwari has been sent for governmental approval and publication by the A.F.S.O. vide his letter

no. F2 ( ) survey/94-95/418, dated 24th August, 1994.

All the 134 villages falling inside the boundary of the sanctuary are revenue villages. The presence of large number of villages has created a honey combed situation of the forest area. Cattle and human population of these villages exert tremendous biotic pressure on the adjoining forest area.

3.3 Leases

No leases have ever been granted for forestland for any purpose. According to the Forest Rights Act of 2006, 425 rights have been bestowed within the Sanctuary. There has been a rise in fire incidents and grazing activities in these areas following the issuance of FRA pattas. Particular focus should be directed towards areas where rights have been allocated under FRA-2006 to prevent the further encroachment of adjacent forest land by rights holders under this legislation.

3.4 Eco-Tourism and Interpretation

Phulwari Ki Nal sanctuary has significant potential for tourism due to its rich diversity of flora and fauna, along with notable historical and religious sites located within the sanctuary. Wildlife enthusiasts can observe species such as Panther, Wolf, Sloth Bear, Jungle Fowl, Wild Boar, Sambar, Chinkara, Four-horned Antelope, and many other wild animals, in addition to over 200 bird species present in this sanctuary. The influx of tourists has noticeably increased, attributed to the sanctuary's wildlife and historical significance. The role of media and various promotional methods has enhanced the sanctuary's popularity.

It is crucial for the sanctuary's management to improve visitor facilities like roads, viewpoints, park literature, and camping areas. Efforts should focus on maximizing the use of existing rest houses. The rest house situated within the sanctuary can be offered to wildlife enthusiasts and nature lovers at set rates, providing a distinctive forest experience. This initiative will also improve income opportunities for local communities. Nevertheless, while promoting tourism, the fundamental principles of wildlife conservation will take precedence over tourist activities.

3.5 Research, Monitoring, and Capacity Building

Research Monitoring

Minimal research efforts have been conducted in the sanctuary to date, yet there is considerable potential for exploring various topics. A comprehensive strategy along with potential research topics has been outlined in the relevant chapter of this management plan. Currently, the only method used for monitoring activities is visual observation. The sole written record available is the biannual census, which provides a snapshot of the habitat’s health. Until now, no database has been established, and limited information exists regarding various habitat parameters, changes in the habitat, wildlife movement, and the behavior of animals within the sanctuary. The recent introduction of the Mstripes application aims to document the movement of wildlife and any illegal activities. This initiative will facilitate the creation of a database related to wildlife movements and changes.Monitoring of wild animal population is done by periodic census but no scientific research activities

have been started. No database has been created and not much information is available about various parameters of habitat, habitat changes, movements of wild animals, ethological aspects of wild animals of the area.

Phulwari Wildlife Sanctuary is a least studied protected area of Rajasthan. Sharma (1994,'95a, '95b, '97, '2000) and Sharma and Tehsin (1994) have studied few aspects of Wildlife of this Sanctuary.

Former Range officers Sh. Satish Kumar Sharma of this sanctuary has completed Ph D. research work about various aspects of bio-diversity of this sanctuary. He has registered himself for this study in M.L.S. University Udaipur. His findings may prove beneficial for better management of wildlife.

Capacity Building

Staff involved in management of sanctuary has not received specialised training in "Wild Life Management". The need for training strategies and action plan has been discussed in relevant chapter of this management plan.

3.6 Administration and Organisation

Looking into different aspects, extent of area and difficult terrain the present staff is insufficient. Almost for every 5 sq KM one forest guard is assential. So to overcome these problems it is proposed to increase the strength of staff as mentioned below in Table 3.2

Table: 3.2
The proposed strength of staff for protection of Sanctuary

S. No.	Name of post	Available strength	Proposed strength	Vacant
1.	ACF	1	1	-
2.	Range officer	3	4	1
3.	Forester	2	12	10
4.	Astt. Forester	3	12	9
5.	Forest Guards	35	60	25
6.	L.D.C	-	4	4
7.	Driver	-	2	2
8.	Class IV	-	4	4
9.	Chowkidar	-	2	2

Administrative set up:

Administrative set up of Phulwari Wildlife Sanctuary is as following:

Deputy Conservator of Forests at Udaipur

↓

Asstt.Conservator of Forests Hedq.Kotra

↓

RFO at Kotra	RFO at Panarwa	RFO at Mamer
2 Nakas at Patharpadi, and Dhedmariya	4Nakas at Panarwa,Birothi, Daiya and Ambasa	3 Nakas at Mamer, Mahadi and Mahad

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CHAPTER-4
MANAGEMENT ISSUES OF PROTECTED AREAS

4.1 APPRAISAL OF EMPIRICAL FINDINGS

4.1.1. Habitat selection by major herbivorus/Omnivore Species including livestock along anthropogenic stress gradient during pinch and other seasons.

Panther:-

The Panther is the top carnivore of the sanctuary. They are inhabiting the forests of all ranges The woody hilly tracts forms the best habitat for the Panthers.

The striped Hyna:-

Hyena is nocturnal in nature. They are known as the scavengers as it eats the died animals and left over portions of kills of other animals. Occasionally goats and sheep are lifted by them.

Jackal :-

This species prefers outskirts of the sanctuary. It hunts small animals for food and does scavenging on dead animals too. It is commonly occurring in the sanctuary. It is very fond of Ber fruits.

Hanuman Langur: -

It is a folivorus semi-arboreal primate. It likes a variety of food items like foliage, fruits, buds, seeds, bark etc. It devours leaves of Mahuwa,

Godal, Calotropis, Salar etc. A big troop can be seen near Dudhaleshwar temple, where it roosts regularly.

Indian small Civet and Toddy Cat :-

These two species of civets inhibit in thehollows of trees and crevices of the rocks. They are omnivorous natural animals, found in good number over here.

Common Mangoose:-

It is a speciy which is commonly occurring in the sanctuary. It is diurnal; prefer relatively open areas to live. It hunts rodents, birds, and reptiles for its survival.

Ruddy Mangoose:-

It prefers relatively denser part of the sanctuary. It is a diurnal, carnivorousanimal, hunts small birds, reptiles, mammals for food. This speciesis less common within the geographicallimits of the sanctuary.

Sloth Bear :-

it is a myrmecophagous bear species. It feed on fruits,ants and termites.it is listed as vulnerable on the IUCN red list.

4.1.2. Status of protected area linkages with nearby areas.

Phulwari Ki Nal, TodgarhRaoli, and Kumbhalgarh Wildlife Sanctuaries are significant wildlife reserves located in Rajasthan. These sanctuaries are positioned within the south-central and southern regions of the Aravalli ecosystem. They are interconnected, allowing for the

unrestricted movement of wildlife among them. Since both sanctuaries are at the junction of the western edge of the Aravallis and the Thar Desert, their location can be described as ecotonal. Consequently, various elements from both the Aravallis and the Thar can be observed in these reserves. They also serve as vital watershed divides in India. The western slopes give rise to rivers flowing westward, while the eastern slopes support rivers that flow eastward. Thus, each slope has its own distinct river systems.The forest areas of the Udaipur (North) division function as a corridor that links the southern part of Kumbhalgarh Wildlife Sanctuary with the Phulwari Ki Nal Wildlife Sanctuary in Udaipur. The Udaipur forests continuously connect with the forest blocks in the Sirohi Division to the west. In turn, the Mount Abu Wildlife Sanctuary is linked with the forest areas of the Sirohi Division. The landscape stretches into Gujarat state, where protected areas like Balaram Ambaji Wildlife Sanctuary, Jassore Sloth Bear Wildlife Sanctuary, and the surrounding forest regions also contribute to this landscape.

Thus, the entire expanse extending from Todgarh-Raoli Wildlife Sanctuary in Rajasthan to the protected areas in Gujarat constitutes a crucial habitat for a diverse range of wildlife.

4.1.3. **Wild herbivore crop damage across seasons.**

Crop damage by these animals can be a significant issue, particularly during certain seasons. Nilgai, in particular, are known to frequent open habitats near human settlements, increasing the likelihood of crop raids. Factors like water scarcity and habitat degradation can exacerbate these conflicts, as herbivores may seek food and water resources outside protected areas. Effective management strategies, including fencing,

crop protection measures, and community engagement, are essential to mitigate crop damage and promote harmonious coexistence between wildlife and local communities.

4.1.4. **Carnivore conflict data**.

Attached in Annexure 25.

4.2 Identification of Management Issues in the PA

1. Grazing Control
2. Poaching Control
3. Resource dependency of Local People
4. Encroachment Control
5. Fire Control Problem Identification
6. Checkpoints/Barriers
7. Boundary Demarcation & Mutation
8. Man-Animal Conflict
9. Infrastructure & Communication
10. Eco Development
11. Soil & Water Conservation
12. Water Management & Combating Drought Conditions
13. Development of Prey Base in Poor Wildlife Areas
14. Ecotourism
15. Education & Awareness
16. Training
17. Management Information

4.3 Important Management Issues

- **Hunting**

Prior to the establishment of the sanctuary, the forest area was a "Shikargah" (hunting ground) for the rulers of Marwar and Mewar. However, with the enactment of the Wildlife (Protection) Act, 1972, all hunting activities were completely prohibited. The sanctuary management remains vigilant to prevent any resurgence of illegal hunting activities within the area.

- **Illegal Activities:**

Poaching

Although significant poaching events are uncommon, there have been sporadic reports of wild boar poaching, particularly in the winter season. To address these challenges, the management of the sanctuary implements strategies like erecting barriers at critical roads and access points, carrying out thorough patrols by personnel and officers in vulnerable areas, and ensuring a robust communication network.

- **Illegal Cutting of Trees**

The sanctuary is facing increased pressure due to the rising need for fuel and fodder. This area is home to economically disadvantaged tribal communities who often resort to cutting down trees and selling the wood as fuel in nearby markets and villages.

In addition to these tribal residents, there are 121 villages located around the sanctuary. Many villagers from these areas have the right to collect fuel-wood for personal use. The high demand for firewood for domestic purposes significantly contributes to the illegal harvesting of green trees. Despite a Supreme Court order imposing a strict ban on the removal of any forest products, including dead wood, the people living in the surrounding villages continue to secretly transport loads of firewood from the sanctuary.

- **Illegal Removal of Non-Wood Forest Produce, Encroachment, and Other Illegal Activities**

There have not been any notable instances of mass gathering of non-wood forest products from the sanctuary, although nearby villagers sometimes gather medicinal plants, herbs, and shrubs. Encroachment is a persistent issue, with 151 instances covering more than 426.72 hectares of forest land currently being cultivated following the allocation of forest rights under the Forest Rights Act (FRA) 2006. It is crucial to focus on preventing further encroachment, particularly in regions where rights have been granted under the FRA. Constructing boundary walls around these areas is one suggested measure to safeguard the surrounding forest land.

- **Livestock Grazing**

Managing livestock grazing stands as a significant challenge within the sanctuary. The intense grazing pressure, especially from substantial groups of goats and sheep belonging to the Rebari community, has resulted in forest cover loss and has hindered the natural growth of

young plants. The approach to management involves limiting grazing regions, encouraging stall feeding, and engaging local communities in sustainable grazing methods. Nevertheless, these strategies necessitate stringent enforcement and ongoing collaboration with the local population to achieve effectiveness.

- **Wildfires**

Wildfires present a serious threat to the sanctuary, especially in the arid summer months. These fires are primarily ground fires, which can obliterate the essential upper humus layer of the soil needed for plant recovery. Often, fires are inadvertently ignited by local customs like "Magra Pooja," where certain forest areas are purposefullyset on fire, or due to carelessness, such as discarding lit cigarettes. Strategies for managing fires include establishing fire lines, boosting patrols during periods of high risk, and performing controlled burns to decrease the build-up of combustible materials.

- **Insect Attacks & Pathological Problems**

Insect infestations and pathological issues, particularly during the rainy season, present ongoing challenges. Leaf skeletonizers, stem borers, termites, and fungi such as Ganoderma often affect the vegetation, especially on broad-leaved species. Continuous monitoring and timely intervention are necessary to manage these problems and prevent widespread damage to the forest cover.

- **Wildlife Health**

The health of wildlife in the sanctuary is directly linked to the availability of food resources and the quality of their habitat.

Overgrazing by domestic livestock has depleted grass quality, which in turn affects herbivore populations and disrupts the food chain. This imbalance can lead to starvation and reduced health among carnivores. To mitigate this, it is essential to improve grassland management and ensure that domestic cattle are regularly vaccinated to prevent the spread of diseases to wildlife.

- **Interagency Programs and Problems**

Effectively managing the sanctuary necessitates collaboration among various government agencies operating in the region. Nonetheless, conflicts may arise due to varying priorities, particularly in relation to the Forest Conservation Act of 1980, which limits non-forestry activities within the sanctuary. Sanctuary management needs to collaborate closely with agencies such as the Public Works Department (PWD), Irrigation, and Public Health Engineering Department (PHED) to ensure that any infrastructure development aligns with conservation objectives. Partnerships with veterinary and horticulture departments are also crucial, although more coordinated efforts are required to fully leverage these collaborations.

These ongoing management strategies are vital for preserving the ecological integrity of Phulwari Ki Nal Wildlife Sanctuary and safeguarding its diverse wildlife and natural resources for future generations. Ongoing monitoring, community involvement, and interagency cooperation are fundamental to the success of these initiatives.

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CHAPTER-5
VISION AND OBJECTIVES FOR THE PROTECTED AREA AND SURROUNDING LANDSCAPE

5.1 OVERALL VISION AND MANAGEMENT STRATEGY

Vision

Improved ecosystem by mainstreaming of wildlife concerns on Phulwari Ki Nal Wildlife Sanctuary landscape with the protected sanctuary area and developed linked area.

Management Goal

To maintain a viable Population of Wild animals and its habitat in Phulwari Ki Nal Wildlife Sanctury and Sustainable use of biodiversity in Surrounding area with maintaining a harmonious relation with indigenous people without causing any stress on protected area resources.

Management strategy

The strategy for achieving the objectives, envisaged in previous chapter in light of enlisted constraints is multipronged. The strategies for management of the sanctuary would focus on:

1. Ensuring & improvement of Food availability for wild life.
2. Ensuring water availability: Soil & Water conservation.
3. Overall improvement in quality of habitat.

4. Conserving & restoring the floral & faunal biodiversity of the area.
5. Grazing Control
6. Poaching control
7. Fuel wood & fodder problem.
8. Fire control.
9. Encroachment control.
10. Check points for illicit movement of faunal & wild life products.
11. Boundary demarcation and mutation.
12. To reduce Man- animal conflict.
13. Infrastructure & communication
14. Eco-development.
15. Combating drought condition.
16. Development of prey base.
17. Promotion of Eco-tourism.
18. Nature Interpretation.
19. Awareness & education programmes.
20. Training.
21. Management Information system.
22. Zonation of sanctuary in Core, Buffer and Ecotourism zone

Objectives

(i) Conservation of biological diversity and improvement the food, shelter and water availability to wildlife.

(ii) Eco-restoration of degraded areas.

(iii) To rebuild the population of herbivores in the Wildlife Sanctuary.

(iv) To maintain essential ecological process and life support systems with particular emphasis to improve the hydrological regime through drainage line treatment (DLT) and soil & moisture

conservation works.

(v) Eco-development of the protected area and people in and around the sanctuary.

(vi) To enhance the level of awareness among the stakeholders.

(vii) To protect the ancient Mahuwa groves and riverine forest corridors along the rivers and nallahs typical to the sanctuary.

(viii) To develop and promote Eco-tourism on sustainable basis.

(ix) Protection and management of water sheds though drainage line treatment (DLT) of tributaries of Wakal river, which is a life line and mega-water hole of the Sanctuary.

(x) To improve capacity building of the staff though appropriate training and strengthening of infrastructure.

(xi) To reduce negative impact of people on the protected area and vice-versa through Eco-developments programmes.

Perceived Issues in achieving objectives.

1. Biotic pressure from villages situated on the periphery of the sanctuary.

2. Inadequate intelligence information network.

3. Poor integration with other departments.

4. Inadequate soil depth to promote regeneration and thus to ameliorate habitat.

5. Insufficient staff for protection and historical buildings within the limits of sanctuary.

6. Lack of awareness about eco-tourism concept & insufficient interpretation facilities.

7. Lack of essential facilities like availability of drinking water for tourists in the sanctuary area.

8. Higher age group and educational background of the staff with least training and technical exposures.

9. Changes in the existing land use pattern in the near vicinity of the sanctuary.

10. Inadequate moisture conservation in the sanctuary area.

11. Lack of scientific information and database.

12. Lack of amenities for staff personals involved in management of Phulwari Ki Nal Wild Life Sanctuary.

13. Lack of desired number of efficient field staff along with the lack of vehicles for patrolling in sanctuary area.

14. Deployed native field staff belonging to the sanctuary area or native to the villages on the periphery of the sanctuary.

15. Unavailability of land to settle the new house hold formed due to population expansion resulting in encroachment on sanctuary land.

5.2 STRENGTHS WEAKNESSES OPPORTUNITIES THREATS (SWOT) ANALYSIS

Strengths

1. Located in Udaipur district in Rajasthan. Phulwari Ki Nal Wildlife Sanctuary cover a large area of 511.41 sq km

2. Its peculiar situation and topography positively contribute to the strength of P.A. in terms of inaccessibility of the area.

3. The rich assemblage of large predators /prey includes leopard, striped hyena, sambar, Blue bull and four horned antelopes. Nothing is known about the lower vertebrate but they may be of great importance.

4. Sanctuary has rich biodiversity with good paches of *Madhuca Indica,* which can act as plant micro reserve.

5. Phulwari Ki Nal Wildlife Sanctuary protects a significant cultural heritage in addition to wildlife.

6. Dedicated staff.

Weaknesses

1. There are so many vacant posts of Field Staff.

2. Terrain is very tough for monitoring.

3. Fire prone area. Frequent fires occur in the area.

4. Lack of skills and trainings to all levels of staff.

5. Insufficient funds.

6. Lack of timely fund release mechanism.

7. Border area with gujrat state

Opportunities

1. Can be developed as tourists attraction.

2. PA authorities have made efforts to increase local participation by training guides. The tourism vehicles and other ancillary activities related to tourism provide employment to local people.

3. Budget provided in various C.S.S. and State Plan Schemes.

4. Support from Administration, Police and other departments for conservation and protection is a good.

Threats

1. Villagers and urban residents place intense demand on natural resources, particularly for grazing and fuel wood, which at present cannot be satisfied outside the reserve. As fuel wood required for

numerous villages and a few large towns are gathered from the PA, large areas are severely degraded, affecting plant and animal communities.

2. Total 134 Villages are inside the sanctuary. Also being a tribal area individual FRA rights are given inside the sanctuary. Which creats large anthropogenic pressure for sanctuary.

3. The increasing numbers of visitors to the reserve pose problems for PA management, since tourist concentrate in the one zone and pilgrims at temple sites.

4. Invasion of Lantana and other is a serious threat.

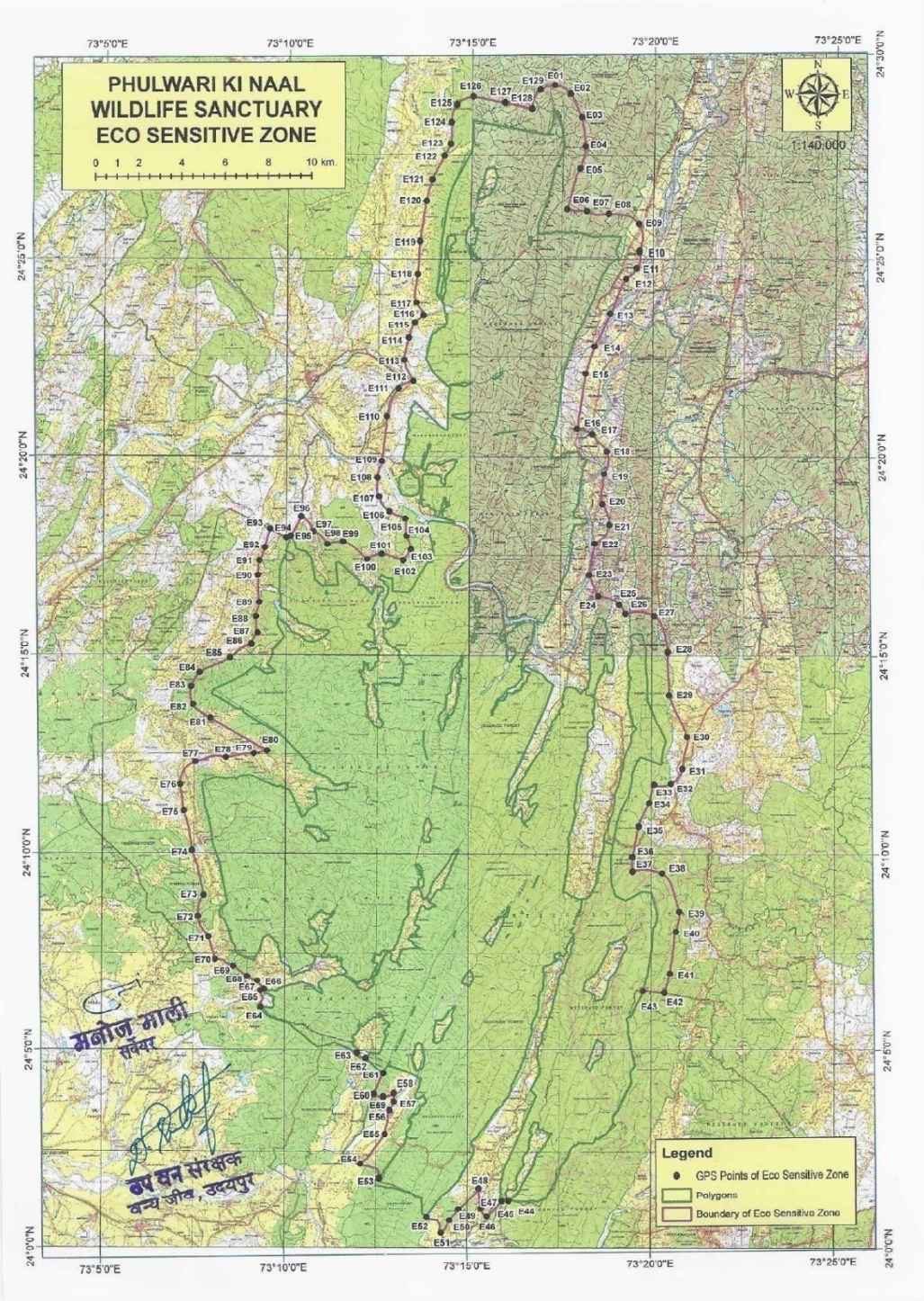
5. Deterioration of eco system.

5.3 LIST OF ZONE AND THEME PLANS.

5.3.1 List of Zone plans

No zonation in the sanctuary has been done so far. Eco sensitive zone is declared for periferial area of the sanctuary, which is act as buffer area for sanctuary.Eco sensitive zone of the sanctuary is notified on may 17th, 2024. List of activities permited, regulated and prohibited are described in Part B.

Survey of India topo sheets of the ESZ area with demarcation of the boundary of Sanctuary and the ESZ area



5.3.2 List of Theme Plans.

- Theme Plan for Grazing Control

- Theme Plan for Poaching Control
- Theme Plan for Resource Dependency of Local People
- Theme Plan for Fire Control Problem Identification
- Theme Plan for Encroachment Control
- Theme Plan for Checkpoints/Barriers
- Theme Plan for Boundary Demarcation & Mutation
- Theme Plan for Man Animal Conflict
- Theme Plan for Infrastructure & Communication
- Theme Plan for Eco Development
- Theme Plan for Soil & Water Conservation
- Theme Plan for Water Management & combating Drought Conditions
- Theme Plan for Development of Prey base in poor Wild Life Areas
- Theme plan for Tourism in Phulwari Ki Nal WLS
- Theme Plan for Ecotourism
- Theme Plan for Nature Interpretation
- Theme Plan for Education & Awareness
- Theme Plan for Techniques of Population Estimatio
- Theme Plan for Training
- Theme Plan for Management Information

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CHAPTER-6
PROPOSED MANAGEMENT INTERVENTIONS FOR SANCTUARY

6.1 Specific interventions for each zone plan

No zonation inside the sanctuary is done and proposed. Outside the sanctuary Eco Sensitive Zone is already declared. The area situated in the interior of sanctuary with good density of forest crop & having more movement of wildlife will be managed as :

i. For habitat improvement activities.
ii. For enhancing the herbivera population.
iii. To enhance the prey base.
iv. For introduction and regeneration of special and threatened species.
v. Ban on entry of tourist vehicles.
vi. Eradication of invasive species on top priority

The area near the outer periphery of the sanctuary will be managed as :

i. Planting of native species in the areas which went devoid of the native species of the area.
ii. Maintenance and repair of building of the staff.
iii. Maintenance of Eco-Track.
iv. Eco –tourism activities can be encouraged.
v. Tourist vehicles can be allowed.
vi. Gap plantation in areas devoid of vegetation
vii. Eradication of Prosophis and Lantana in phased manner.

With an object of total management of the area following guidlines should be enfored in the area.

i) Total protection of the area be accorded top priority.

ii) Fire protection should be strictly enforced. Fire lines should be maintained and new fire lines should be created.

iii) Existing system of division of area into blocks and compartments should be continued.

iv) Grazing should be controlled strictly.

v) Basic facilities like drinking water and urinals should be provided to promote tourism.

vi) Eco-tracks should be maintained & developed

vii) Boundary demarcation should be ensured.

viii) Eco-development activities should be taken in whole of the area.

ix) Adequate number of water holes should be developed.

x) In Nallahs, traversing through the sanctuary area, site-specific soil & water conservation works should be taken up.

XI) Entry of domestic animals in fenced area should be strictly prohibited.

xii) Soil and moisture conservation in all the three zones to be continued including desiltation of siited water bodies and repair of damaged water bodies

6.2 Specific interventions for each Theme Plan

6.2.1 Theme Plan for Grazing Control:

About 1.64 Lac domestic animals including cow, buffalo camel, goats &sheeps belonging to the inhabitants of villages situated inside and on the periphery of sanctuary depends on the sanctuary area for green fodder. The prevailing tendency of leaving their cattle to graze freely in the sanctuary is mostly in the areas, where there is least movement of wild animals, areas having poor soil quality, sparse vegetation and availability of green fodder. Besides this, the grazing is frequent in the buffer area. The period from July to October is critical since most of the domestic animals of nearby villages are left into the sanctuary area. Moreover, restrictions on collection of grasses from sanctuary have further increased the problems of these villagers. Generally the domestic animals are left in sanctuary areas around forenoon and taken away by early evening. The grazing incidences are reduced after Deepawali festival.

The grazing by domestic live stock has adversely affected the regeneration. The quality of grasses has deteriorated in buffer area. Collection of grasses in the controlled manner in the sanctuary may be allowed to reduce the formation of "grass bed" in higher altitude of the sanctuary areas which in turn will enable the natural regeneration.

Grazing problems in Phulwari Ki Nal wild life sanctuary:

The Sanctuary is facing grazing issues. The main reason for illicit grazing in the sanctuary is lack of village pasturelands & fodder in the villages situated inside and on the periphery of sanctuary. Cattle rearing community "Raibarees" live in the sanctuary having herds of sheep and goats and buffalos.These herds are browsing in nature rendering no natural regeneration.

Adverse Impact of the Illicit Grazing in Phulwari Ki Nal wild life Sanctuary;

- The buffer area is getting degraded.
- Damage to the stone wall fencing of closures needs repair every year.
- Reduced regeneration of better grasses & tree species.
- Possibility of spread of communicable diseases in the wild animals through domestic animals during grazing
- Possibility of wild life poaching in the lieu of cattle grazing

Action Plan to Control Grazing:

The grazing problem is acute in the sanctuary in many villages situated at periphery, since they have little or no pasture or revenue lands available within their village boundaries for development of pastures. Hence "Stall feeding" and Agroforestry with special emphasis on planting fodder-yielding trees is to be promoted. On this aspect deployment of more number of protection staff is the need of the time. Besides these cattle impounding places (Kanji House) should be developed within limits of sanctuary.

On the eastern and southern outskirts beyond the boundaries of sanctuary, community & forest land (other then sanctuary is available. Fodder plot areas are to be selected from these available forest blocks, and should be developed to enhance the productivity of fodder. Only cutting of grasses should be allowed from these areas, so as to promote stall-feeding over the period of time. About 350 hectares areas per year may be taken under the Fodder Development Plan" from these forest blocks. Productivity of "Grass Birs" present towards western plains should be increase so that pressure on sanctuary forests can be minimised. To provide grasses for cattle-controlled collection of grasses can be allowed after the seeding season of the grasses even from the selected part of the sanctuary area to stop “grass bed” formation as mentioned earlier.

6.2.2 Themes Plan for Poaching Control

No major poaching ground is operative in and around the area and thus it is not a serious problem in this sanctuary. Arrangements are made to check such happenings by putting barrier on roads entering in sanctuary, by ensuring intensive visits of staff and officers in the sensitive areas and with good communication system.

General Strategies for controlling Poaching:

The following strategies are proposed to tackle the menace of poaching:

I) Improving Staffing Pattern:

The successful safeguarding of the wildlife sanctuary relies on the capabilities of the staff. In addition to quantity, the quality of personnel is also essential, meaning they should be young, educated, and well-trained. The process of recruiting new forest guards and foresters is currently underway. For effective protection at the ground level, these two groups require a competitive edge. They are the individuals who form the front-line workforce. Educated and trained young individuals can better address criminal activities. It is crucial to keep them informed about the latest developments in Wildlife Management, as well as the principles of biodiversity conservation, "Ecosystems," and "Population dynamics," among others. Entrusting them with tasks that demand a certain level of training and education has become increasingly challenging. Furthermore, there is additional pressure on the staff to communicate with villagers in Joint Forest Management to foster local community involvement in protecting the sanctuary. The team lacks consistent training necessary for maintaining their preparedness and coordinating actions against offenders. The staffing structure should be tailored to meet the unique requirements of the sanctuary and reviewed regularly, every five years. A strict transfer and deployment policy should be implemented to avoid placing staff members in their native areas.

Staff members should receive targeted training in crime management, in addition to comprehensive knowledge about the relevant laws, to effectively build strong cases in instances of criminal activity. The inclusion of female personnel in lower ranks to address female offenders would provide a significant advantage in enhancing protection against such offenders.

II) Mobility:

Criminals today are better equipped with fast vehicles, modern firearms, and advanced communication tools. The sanctuary staff is unable to match their capabilities. It would be beneficial for all Range officers and Assistant Conservators of Forests (ACFs) responsible for the sanctuary to be provided with jeeps or Boleros, while foresters should receive motorcycles. The current vehicles are outdated and in need of urgent replacement to enhance mobility. Considering the terrain and topography of the sanctuary, it is crucial to have one tractor stationed at each Range Head Quarter.

III) Control Over use of Firearms around the Sanctuary:

It is essential that strict compliance of provision of Sec. 34 of Wildlife (Protection) Act 1972 should be observed. The registration of weapons of inhabitants living in and around the sanctuary area should be completed within the limited period.

i) Fire Arms:

It is need of time that new and advance firearms should be provided to all officers involved in protection of sanctuary i.e. from Forest Range officer down to Forest Guard. The government order pertaining to use of firearms is inadequate. The government order prohibits the use of Firearms at night whereas the poachers prefer night hours for crime.

ii) Restriction of Unauthorised Movement in Sanctuary:

Frequently, both villagers and urban residents enter the sanctuary without proper authorization. These entries occur either to find the fastest path to a location or are carried out by individuals engaged in unlawful activities. It is essential to oversee and control such access, as it provides a chance to carry out offenses within the sanctuary.

iii) Wild Life Crime Prevention:

The inhabitants residing within and near the sanctuary, as well as those in nearby villages, are predominantly from the "Bhil, Garasiya" tribe. This tribe has a lower literacy rate and a strong inclination towards hunting. An organized hunting event conducted by the Bhil tribe, known as “Heda,” takes place around the "Holi" festival, where it is considered fortunate to successfully hunt either small or large wild animals on this day. Given this context, it is crucial to implement preventive measures to reduce wildlife crimes committed by tribal members. The following actions are suggested to combat wildlife offenses by the tribes:

a) The personnel responsible for protection should remain alert to the movements of the tribal members residing on the outskirts and in neighboring villages.

b) The establishment of check posts is necessary to maintain vigilance at all entry and exit points of the sanctuary.

c) The inclusion of female staff among the ground workers is important to monitor any women offenders involved in illegal activities.

d) A network of informants should be formed in suspect villages and communal areas such as bus stations and railway terminals. These informants should receive rewards for providing accurate information, albeit discreetly.

e) Staff members should be given comprehensive training to effectively handle poaching incidents and explore new patrol techniques.

f) Each checkpoint (Naka) within the sanctuary should be equipped with a minimum of two double-barreled shotguns.

g) A prompt compensation process must be established for reporting livestock kills by carnivorous animals.

iv) Field Level Improvement:

The personnel tasked with safeguarding the sanctuary require enhancements at the field level, which include:

a) Continuous availability of a flying squad at the sanctuary headquarters, with distinct staff assigned for both day and night patrols, accompanied by two drivers.

b) Establishment of a patrolling log at Forest Nakas to document inspections of beats under the Naka's jurisdiction, with all wildlife activity information recorded in this log.

c) Review of wildlife crime cases by the ACF and DCF prior to any compounding or court charge sheet filing.

d) Separation of tourism/VIP and protocol responsibilities from protection duties.

e) Court and offence cases filed against personnel should be treated as government matters unless proven otherwise.

f) Field personnel should receive training and skills development to effectively handle wildlife offence cases.

g) The field staff responsible for protection primarily consists of older foresters, Forest Guards, or uneducated Cattle Guards. It's essential to replace them with a younger and more dynamic workforce for this particular role, a process that will begin with ongoing recruitment.

h) At the range level, three to four Forest Guards should be designated as reserves to respond to any poaching-related information.

i) A procedural guideline for forensic investigations concerning wildlife materials should be established to ensure robust evidence for court proceedings in wildlife offence cases.

j) Teams engaged in anti-poaching efforts should be appropriately rewarded.

k) The working conditions of wildlife staff should be adjusted to enhance motivation and efficiency; an awards program and accelerated promotions could serve as motivating factors.

l) Forest Officers should be granted police authority under the Arms Act within a five-kilometer radius of sanctuary boundaries.

m) Wildlife personnel should receive hard duty allowances.

The following measures are suggested to combat poaching at Phulwari Ki Nal Wildlife Sanctuary:

i) Night patrols should be improved by ensuring there are enough personnel.

ii) Close watch should be maintained at water holes, as these areas are the most vulnerable to poaching.

iii) The registration of licenses within a 10 km radius of the sanctuary's borders should be finalized.

iv) Information pamphlets that outline wildlife offense cases and their repercussions should be distributed to raise public awareness.

v) Female staff members should be incorporated to address incidents involving women offenders.

vi) Ensuring people participation in poaching control through developing local information network system and suitablereward to informers.

6.2.3 Theme Plan for Resource dependency of Local People

Existing Situation

The rising demand for fuel and fodder has placed additional pressure on the resources of the sanctuary. The sanctuary is home to economically disadvantaged tribal communities who engage in cutting down trees and selling the wood as fuel in local markets. Alongside these tribal inhabitants, there are 121 villages located on the outskirts of the sanctuary. Although the Central Empowered Committee's order No.1-26/CEC/2003 dated July 2, 2004, has revoked the rights of these villagers to collect fuel wood from the sanctuary, they continue to covertly gather fuel wood and fodder from the surrounding areas. The heightened demand for fuel wood has led to the illegal harvesting of green trees. This unlawful tree cutting causes significant harm to wildlife habitats and disrupts the natural movement of animals. The consumption of fuel wood remains high in the villages adjacent to the sanctuary. While there are forest areas beyond the sanctuary's boundary, as well as agricultural residues, cow dung cakes, and LPG connections in higher-income households that reduce the demand-supply gap to some extent, further actions are needed to lessen reliance on sanctuary resources for fuel wood. Special initiatives, like the Ujjwala scheme providing gas connections to low-income families living near the sanctuary and subsidized LPG cylinders from the Rajasthan government, have notably decreased the dependence on fuel wood. Fodder is another essential need for which the residents rely on the sanctuary's resources. As

mentioned earlier, the cattle population of approximately 1.64 lakh, belonging to the inhabitants of villages within 5 kilometers of the sanctuary's boundary, directly impacts the sanctuary's resources to meet their fodder needs.

Strategy to curb the Fuelwood & Fodder problem

i) Number of agriculture fields are present at the periphery of sanctuary, generates scope of planting fodder and fuelwood yielding species under "Agroforestry programme" Awareness among the inhabitants of these villages is to be generated regarding promotion of stall feeding and for planting of fodder yielding tree species on the marginal lands and agricultural bunds etc.

ii) Schemes such as ujjawalyojna, bio-gas, fuel efficient crematorium, solar lights, solar cookers and fuel efficient chullahas should be promoted in these peripheral villages so as to reduce the dependence of inhabitants on sanctuary and adjoining eco-sensitive areas.

iii) An area of 100-200 hectares in villages situated at the periphery of sanctuary (forest lands of adjoining territorial divisions) should be put under village woodlots and grasslands every year to meet the fuel wood requirement of thevillagers during the plan period. The village eco-development committees should be encouraged to manage these pastures & woodlots.

iv) Villagers residing in ZI (Eco-sensitive) of the sanctuary should be motivated to plant fodder and small timber yielding trees on the bunds of their agriculture fields

v) Collection of village wise data regarding villagers dependence on sanctuary resources to fulfill their demand of fuelwood and fodder and estimation of demand supply gap should be carried out and necessary measures should be initiated to narrow the gap.

vi) Special provision for gas connection to villagers on the periphery of the sanctuary especially for low income, on subsidised rate can reduce the dependency on fuelwood.

6.2.4 Theme Plan for Fire Control:

Problem Identification:

Due to deciduous nature of forest, leaf fall occur in the December-February. The leaf litter and dried trees causes serious fire hazard during summers. The fire season starts from the March and continuous till June.

The fires are mostly of accidental type. In tribal area, sometimes in forest block Paba, Majawara and Bijapur fire causes great harm to the forests. A single uncontrolled fire can ruin the forests and destroy the entire ecosystem, including the wild life. Fire not only destroys young regeneration but adversely affect the humus layer

thus deteriorating the soil fertility. The soil gets exposed to be acted upon by sun & wind.

The forest fires are mostly experienced during summer months i.e. from March to June. Due to deciduous nature of forest leaf fall occur in the December-February. The leaf litter and dried trees from serious fire hazard during summers. The fire season starts from the March and continues till June.

The fires are mostly of accidental type. In tribal areas sometimes in forest block Paba, Majawara and Bijapur fires caused by Adivasis as a result of Bolma in which they offer Magra Pooja by burning forest area. The fires are also caused due to negligence of right holders. The heavy traffic on metalled roads of Sayara-Sadri and Desuri-Charbhuja is also cause of forest fire. It also happens due to the throwing ignited cigarettes, match sticks etc.

The forest fire causes serious damage to both plant and animal life. The young regeneration of tender plants dies and

Onlyfire resistant species such as Tendu, Dhavraetc come up well. It causes tremendous damages to Bamboo which forms ideal habitat for wild animals. Due to fire many animals are killed and their eggs are destroyed.
To prevent forest fires and damage caused out of it integrated fire management measures are to be adopted.

The Strategy:

The strategy to prevent fire incidences includes:

i) Creation of awareness among villagers residing on periphery of sanctuary, visitors visiting the sanctuary and laborers engaged to carry out various developmental activities in the area, by carrying out education programme, and by putting signage's at fire prone places.

ii) Early detection of fires through well-conceived network of communication system & observation points. Besides this patrolling has to play a vital role in prevention & control of fires.

iii) Fast counter measures in case of fire outbreak.

iv) Immediate& versatile follow up action.

Each of above component has to play a vital role in prevention and control of fires.

Action Plan to Prevent & Control Fires

i) Existing fire lines in sanctuary area should be cleared every year before summer season. Presently in sanctuary area 194 Kms. long fire lines are existing, out of which 100 Kms. long fire lines are proposed to be cleared every year during plan period.

ii) The field staff of wild life sanctuary should be given proper training to fight the fire.

iii) Firefighting equipment should be provided at Range head quarter of sanctuary and at Nakas, and staff personnel should be given proper training to use them.

iv) Existing ohdi's (the ancient shooting boxes built by Maharajas) should be repaired and used as fire watchtowers.

v) People living in villages situated at the periphery of wild life sanctuary should be educated about danger and damage caused by the forest fires.

vi) Signage's depicting the damage caused by fires as well the means by which fire can break in the sanctuary should be created at entry point and at places of tourist interest in the sanctuary.

vii) Tourists and city dwellers should be discouraged to carry ignited Bidi & Cigarettes in the sanctuary area to prevent accidental fires.

viii) Firewatchers should be kept to patrol the area during summer season.

Besides identified fire lines, new fire lines should be created as per the sensitivity of area to prevent fire hazard. It is proposed to create 10 Kms. long new fire lines every year during the plan period

6.3.5 Theme Plan for Encroachment Control

Situation Analysis

The encroachments exist inside the sanctuary are scattered at the periphery and some are inside the sanctuary. The encroachments

done by tribals, which are prior to 1.7.1980, are to be dealt with, as per procedure laid down in Govt. order F.1 (18) Van/90 Jaipur dated 27.04.1991 and The Scheduled Tribes&Other Traditional Forest Dwellers (Recognition of Forest Rights)Act,2006 Legal action is to be taken against the other encroachers.

The Sanctuary area is vulnerable to encroachments because of:

i) The field Staff is not well versed with the boundaries.

ii) Adequate survey staff is not available for resolving the disputes.

iii) Mutation of forestland records in the revenue records as well as maintenance of land records at par with revenue settlement is still incomplete.

iv) Large chunk of sanctuary forest land is still surveyed.

v) Forest guards are burdened with control of three to four times the area against the prescribed limits of 10 sq .km

vi) Human population expansion with no other source of available land

Strategy:

i) Patrolling of the boundaries of sanctuary should be done regularly by the staff and any encroachment should be reported immediately.

ii) Inspection of boundary pillars by Range officers and other higher officers should be done time to time as per norms and report should be monitored in review meetings of senior officers.

iii) The non mutated land should be taken on priority basis for mutation.

iv) Land records should be completed and copy of map along with the land record should be given down to the level of Forest guard so as to facilitate the checking of boundary pillars during patrolling.

v) Scientific instrument like GPS should be provided to the Foresters & higher officers and proper training to use them is to be given to them.

vi) Regular monitoring on monthly basis related to encroachment cases should be done at Range level and at division level meetings.

vii) A team of 3 surveyors and inspector should be deployed at Division level to maintain land records and check at ground level at least once in three month.

viii) Construction of pucca boundary wall along the outer periphery of the sanctuary.

ix) Construction of wall or pillars around the land granted to beneficiaries under FRA 2006 to limit the further expansion of encroachment .

Financial requirement for the purpose is annexed at Annexure-48

6.3.6. Theme Plan For Checkpoints & Barriers To Check Illicit Movement Of Forest & Wild Life Products.

Situation Analysis

For control over movement of forest produce, checkpoints and barriers are must. Similarly barriers are essential to curb poaching especially during the winter season. The check barriers sanctioned by CWLW of Rajasthan wide their letter no. F.4 (T) misc/CWLW/99/1982 dated 8.2.1991 are given in following table:

Table 6.2:

SANCTIONED CHECKPOSTS & BARRIERS AT Phulwari Ki Nal WILD LIFE SANCTUARY

A : Existing Checkposts&Barriers :

S.No.	Range	Barrier Location	Naka oprating it	Type (Manned/un manned
1	Kotra	Patharpadi	Patharpadi	Manned*
2	Panarwa	Nalwa	Panarwa	Manned
3	Panarwa	Daiya	Daiya	Manned
4	Mamer	Mahad	Mahad	Manned

* No separate staff is available for operating the barriers. Regular protection staff is doing this duty along with their protection duties.

B : Proposed Checkposts&Barriers :

S.No.	Range	Barrier Location	Naka
1	Kotra	Gamri	Birothi
2	Mamer	Mahadi	Mahadi
3	Panarwa	Ambavi	Daiya

Strategy

To check the movement of forest and wild life products effectively and efficiently the following steps are proposed:

i) Each barrier point should have staff of 2 Forest Guards.

ii) Each barrier point should be equipped with wireless system.

iii) Record should be maintained with respect to the movements, checking done by the staff of barrier.

6.3.7 Theme Plan for Boundary Demarcation and Mutation

Boundary demarcation, mutation & maintenance of land records are essential to check encroachments in the Sanctuary. The staff of Sanctuary should know exactly the area under their control. The record of mutation should be completed, so as to prevent any further allotment of land of Sanctuary, for other purpose.

Strategy:

- Entire land records of Sanctuary should be computerised.
- The boundaries of Sanctuary should be carefully checked and marked clearly on map.
- Beat maps of the Sanctuary area should be prepared showing clearly the boundaries and other important features. These beatmaps are to be provided to the Forest Guard, so that he can take care of the boundaries in his control. The beat should be the basic unit of management and beat guard should be responsible for its maintenance.
- Updating of land records should be regular process. Every year village wise copy of recorded forestland (Jamabandi) should be obtained and incorporated in record. Any alteration or change in yearly record should immediately bring in notice of concerned authorities.
- Mutation of un-mutated land of Sanctuary should be

Completed and proper record is to be maintained at division level.

Requirement of funds for the purpose is incorporated in Annexure-51

6.3.8 Theme Plan for Man-Animal Conflicts:

Existing Situation:

Development of Phulwari Ki Nal Wildlife sanctuary has evolved through different stages. During past, the management of sanctuary area was with state rulers, who have their own rules and regulation to manage the area. Over the period of time the area got degraded because of biotic interference. After declaration of the area as 'Wildlife Sanctuary" under wild life (Protection) Act 1972, the people living around the area got alienated of the forestpersonnel because of their own interests and benefits, which otherwise they are enjoying. The decision of honourable Supreme Court has further quashed the rights of grazing of cattle, collection of fuelwood & fodder and domestic mining from the sanctuary. Of late some cases of cattle lifting & hunting have been reported from the villages lying at periphery of the sanctuary.

This is a major cause of concern, which allows the villagers to retaliate in any case of hurt to cattle or lifting of cattle by wild animals.

Strategy to Curb the Situation:

i) Damage to the cattle or crop of villagers situated on the periphery of wild life sanctuary should be adequately compensated.

ii) Degraded forest & community areas on the periphery of sanctuary should be developed as pastures and village woodlots as discussed under "Theme Plan for Fodder" and "Theme Plan for Fuelwood".

iii) The entry fee to the sanctuary includes eco-development surcharge. The money collected as eco-development surcharge was supposed to be plough back in the region for development. No provision has made so far, hence should be given top priority in interest of the sanctuary.

6.3.9.Theme Plan For Infrastructure & Communication

The terrain of sanctuary is hilly, undulating and having good density of deciduous species. There are many villages inside the sanctuary and people of these villages as well the surrounding villages move in sanctuary area. To provide adequate protection to the wild life and manage the protected area, proper infrastructure and communication is of great importance. The existing infrastructure is follows:

Building:

Phulwari Ki Nal Wild Life Sanctuary has following building within its limits .

Table 6.3:

DETAILS OF BUILDINGS IN KUMBHALGARH WILDLIFE SANCTUARY

A C F OFFICE AND RANGEBUILDINGS

(A) A C F Office (H.Q. Kotra)

S.No.	A.C.F. Office	A.C.F. Residence	Existing (Yes/No.)	Proposed Building	Cost of proposed Building (in lac)
1	**Kotra**	**Kotra**	**yes**	**1 (atKotra)**	**20.00**
	Total			2	20.00

(B) Range Office

S.No.	Name of Range	Existing (Yes/No.)	Proposed RangeBuilding	Cost of proposed Building (in lac)
1	**Kotra**	**Yes**	**-**	**-**
2.	**Panarwa**	**Yes**	**-**	**-**
3.	**Mamer**	**yes**	**-**	**0**
	Total	-	-	0

LIST OF BUILDINGS IN SANCTUARY AREA

S. No.	**Name of Building**	**Locati-on**	**Range**	**Purpose of Use**	**Present Condition**
1	Guard Chawki	Kotra	Kotra	Office of Wanden	Need of Repair
2	Guard Chowki	Kotra	Kotra	Wireless Room	Need of Repair
3	Guard Chowki	Kotra	Kotra	Court of A.C.F.	Need of Repair
4	Guard Chowki	Kotra	Kotra	Residence of Driver	Need of Repair

5	Guard Chowki	Birothi	Kotra	Guard's Residencial	Need of Repair
6	Guard Chowki	Khanchan	Kotra	Residence of Guard	Need of Repair
7	Guard Chowki	Dhedmariya	Kotra	Residence of Guard	Need of Repair
8	Forester Chowki	Patherpari	Kotra	Forester & Guards Residence	Need of Repair
9	Guard Chowki	Dhedmariya	Kotra	Residence of Guard	Need of Repair
10	Check Post Barrier	Patherpadi	Kotra	Barrier	Need of Repair
11	Range office cum Residence	Kotra	Kotra	Residence & office of Range Officer	Need of Repair
12	Guard Chowki	Dungaria	Kotra	Residence of Guard	Need of Repair
13	Guard Chowki	Panarwa	Panarwa	Naka & Residence of Forester	Need of Repair
14	Forester Chowki	Daiya	Panarwa	Forester & Guard's Residence	Need of Repair
15	Range office cum Residence	Panarwa	Panarwa	Residence & office of Range officer	Need of Repair
16	Check Post/Barrier	Panarwa	Panarwa	Barrier	Need of Repair
17	Rest House	Panarwa	Panarwa	Rest House	Need of Repair
18	Guard chowki	Daiya	Panarwa	Guard's Residence	Need of Repair
19	Forester Chowki	Daiya	Panarwa	Forester & Guard's Residence	Need of Repair
20	Forester Chowki	Mahad	Mamer	Forester & Guards Residence	Need of Repair
21	Rang office Cum Residence	Mamer	Mamer	Forester & Guards Residence	Need of Repair
22	Guard chowki	Mahari	Mamer	Residence of Guard	Need of Repair
23	Rest House	Mamer	Mamer	Rest House	Need of Repair
24	Guard chowki	Mahari	Mamer	Guard's Residence	Need of Repair

25	Guard chowki	Jher	Mamer	Dismentled	Need of Reconstructi on

Most of the above-mentioned buildings are old and need regular repair and maintenance.
it is urgent need to construct new buildings to accommodate the field staff.

Basic Amenities

Rest House :

The following are the places existing inside and around the sanctuary where visitors can have comfortable stay (Table 6.4)

Table 6.4:

PLACES OF ACCOMMODATION IN Phulwari Ki Nal WILDLIFE SANCTUARY

S.No.	NameofRestHouse	Place
1.	ForestRest House	Panarwa
2.	ForestRestHouse	Mamer

one more need to be constructed, for stay and tourism purpose

Watch Towers:

C) LIST OF FIRE WATCH TOWER

S.No	Name of watch Tower	Location	Type
1.	SomWatchTower	Som Ghata (Western slope) Dharawan B Forest Block	WatchTower

Manymore need to be constructed, for supervision purpose.

Transport and Vehicles:

For the management and protection of the sanctuary,one jeep are available but this vehicle is very old and very expensive to maintain.Similarily six Motorcycles are available but all of them are very old. Hence it is proposed to purchase one Bolero for ACF, 4 jeeps for Range Officers and group patrolling or Rescue, two tractor, one canter,30 motorcycles during the plan period so that mobility of officers and staff can be increased.

Communication

A network of wireless stations has been installed in and around sanctuary . The wireless sets have been installed at following places:

INFORMATION REGARDING WIRELESS STATIONS

S.No	Name of wireless stations	Location	Status (static/mobile
1	Wireless Station Kotra (Range HQ)	Kotra	Fixed
2	Wireless Station Panarwa (Range HQ)	Panarwa	Fixed
3	Wireless Station Mamer (Range HQ)	Mamer	Fixed
4	Wireless Station Nalwa	Patherpadi	Fixed
5	Wireless Station Nalwa	Nalwa	Fixed
6	Wireless Station Daiya	Daiya	Fixed
7	Wireless Station Ambasa	Ambasa	Fixed
8	Wireless Station Birothi	Birothi	Fixed
9	Wireless Station Mahad	Mahad	Fixed
10	A C F Jeep	Kotra	Mobile
11	Hand set	Pamarwa	Hand set
12	Hand set	Panarwa	Hand set
13	Hand set	Panarwa	Hand set
14	Hand set	Dhedmariya	Hand set
15	Hand set	Mamer	Hand set
16	Hand set	Mahad	Hand set
17	Hand set	Kotra	Hand set
18	Hand set	Mahadi	Hand set

INFORMATION REGARDING EXISTING AND PROPOSED WIRELESS SETS

S.No.	Name of Office	Wire less sets						Remark
		Fixed		Mobile		Hand set.		
		Exis.	Propo.	Exis.	Prop.	Exis.	Propo.	
1	ACF	-	-	0	1	-	1	
2.	RFO Kotra	2	1	-	-	2	3	
3.	RFO Panarwa	4	-	-	-	3	4	
4.	RFO Mamer	1	2	-	-	3	4	
	Total	**7**	**3**	**1**	**1**	**8**	**12**	

The installation of wireless sets upto some extent has helped in preventing offences. At Persent Mostly all the wireless station are working and at some places Hand set are also provided .It is needed that atleast one Hand set should be at each naka It is essential that four hand sets and one fixed set should be kept in reserve at sanctuary head quarter to meet the situation.

Strategy:

Following strategy is proposed to improve infrastructure facilities at Phulwari Ki Nal Sanctuary:

i) Construction of New Forest guard chowkis at 7 places as mentioned in earlier to protect the sanctuary area. These chowkis will also act as barriers to check any unwanted event detrimental to wild life and forests.

ii) Fixing of wireless set of advanced technology along with repeater at Ranakakar.

iv) Fixing of fixed sets at main entry of new proposed roads.

v) Fixing of barriers at new proposed roads.

vi) Provision of Mobile sets and the monthly fixed amount for recharge to the entire staff of the sanctuary.

6.3.10 Theme Plan for Eco-Development

Phulwari Ki Nal Wild Life sanctuary is situated amidst the most fragile eco-system of Aravalli's. The people living in and around the sanctuary remained dependent on sanctuary directly or indirectly for their needs of fuelwood and fodder in past thus causing adverse impact. This generates the necessity for special eco-development programme in and around the sanctuary areas with an object to

improve capacity of sanctuary management to conserve bio-diversity of area, and to reduce the negative impact of local people.

Strategy:

The most effective strategy proposed is to involve the local villagers in development of adjoining areas through process of micro-planning & by ensuring implementation & management of the areas through their active collaboration. Following activities are proposed in these villages and sanctuary area:

i) Pasture development outside sanctuary area to fulfill the need of grasses.
ii) Animal husbandry activities to improve the cattle breed.
iii) Investment in alternate fuel source development.
iv) Investment in developing water holes inside the sanctuary.

v) Habitat improvement in sanctuary area so as to avoid movement of wild animals outside sanctuary.

vi) Introduction of animals of same species from other places to reduce inbreeding depression among the species.

vii) More investment in Entry point activities in villages situated along the periphery of the sanctuary.

viii) Invasive species management by eradiction of these species in phased manner specially Lantana &Prosophis.

ix) Restoration of Main flora –Native flora in the areas which went barren or devoid of these species

x) Management of threatened species by reintroducing and protecting them.

Details of activities have been covered in coming chapter of this management plan.

6.3.11 Theme Plan For Habitat development

For the proper management of the sanctuary, the conservation of vegetation and development of water sources throughout the sanctuary is necessary.

(i) The Vegetation Management

Since the existing vegetation is moderate to dense inside the sanctuary and degraded in area adjoining villages, the vegetation improvements works will be under-taken. The Stone masonry wall will be taken up along the peripheral boundary. This will help in improvement of habitat. This will Act as deterrent toillicit cutters and graziers in entering the forest of the sanctuary thus helping in

the protection of the habitat. Therefore, provision of erection of 3.0 Kms. of pucca wall is made in this plan for every year. Justification for this proposal is that sanctuary has vey good root stock in soil, which can develop by protecting habitat through pucca wall. For the enrichment of vegetation certain operations will be undertaken such as the bamboo-culture works, planting & sowing of seeds of suitable species at appropriate places.

(ii) Improving Availability Of Food:

The development of the area with well-dispersed food sources is the first prerequisite for the sustenance of wild animals of the area. The fruit species like Tendu, Mahuwa, Jamun, Ber, Billi, Imli, Bad, Karaunda, Anwala, Mango, Chironji etc. consitute food for wild animals. These species will not only be conserved but will be planted/sowing of seeds will be undertaken. Tending operations will be undertaken for natural regeneration of these fruit plants.

(iii) Conservation And Propagation Of Bio-Diversity

Phulwari ki nal is unique sanctuary harbouring rare and endangered species of wild flora and fauna. It inhabits large species of plants including trees, herbs, shrubs, grasses and climbers. The multi-storeyed crop composition is ecologically very important for optimum use of space and for harvesting maximum productivity potential of the area. Such a situation will result in increased production of bio-mass and sustenance of the essential ecological processes like soil formation, improvement of site condition, arresting soil erosion, maintenance of hydrological and biogeochemical processes together with establishment and sustenance of proper food chain. The bio-diversity of the area has

suffered a setback in the recent past as the biotic pressure on the resource has been far beyond the carrying capacity of the area. Repeated hacking of regenerated seeding for firewood and fodder, lopping of trees and forest fires have been very detrimental to the natural regeneration of the flora species. Role of every species in the area is complementary to other sister flora of the ecosystem and hence the ecological values of any species cannot be neglected. The floral diversity of the area includes medicinal, religious, environment, ecological and economic values and thus their conservation in situ, is of great significance in the prevailing context.

6.3.12 Theme Plan For Soil & Water Conservation

The terrain of Phulwari Ki NalWild Life Sanctuary is hilly and undulating. Because ofspecific geo-morphological features the depth of soil is shallow. Underneath the shallow soil the earth crust is bouldry and stony causing sparse growth of vegetation. The hill system has high gradient slopes and numbers of nallahas are traversing throughout the area. Due to combined effect of these factors the area of sanctuary is vulnerable to soil erosion. Along with soil erosion there is loss of water conservation because of rapidly flowing nallahas in rainy season. Limited availability of water causes acute shortage of drinking water during summer months.

To improve the water availability and to conserve the soil, following strategies are proposed:

General Strategies:

Intensive soil & water conservation measures are to be taken up on watershed basis. The works proposed are:

i) Drainage Line Treatment (DLT) and other soil and moisture conservation works.

ii) Contour trenching and contour dykes along with grass & fodder seed sowing.

iii) Construction of pucca check dam sin Nallahas supported by loose stone checkdams.

iv) Construction of anicuts and water ponds (Nadis) in the bed of Nallahas.

v) Planting of grass and fruit bearing trees along the nallaha's.

vi) Intensive treatment of Nallas, drains and rills to stop soil erosion.

vii) Planting of soil binding plants on steep slopes to stop soil erosion.

viii) Desiltation of anicuts and other waterbodies that got silted over the years to improve water conservation.

ix) Increase in the height of headwall of anicuts where it is required.

x) Repair of old anicuts and other waterbodies where it is required.

6.3.13 Theme Plan for Water Management & Combating Drought Conditions

Identification of Problem:

The sanctuary area falls in dry tropical zone receiving less rainfall. Good rainy seasons are observed once in three or four years. The area receives about 725 mm average rains in case of average monsoon year spanning three monsoon months. Most of the Nallahas went dry within two to three months after rains. On the other hand the summers are very harsh and dry resulting in the early evaporation of rain water found in low lying areas. Droughts are also frequent which makes the availability of water still worst. These features make the sanctuary area devoid of water and make the water most scarce resource and limiting factor for growth of the sanctuary.Shortage of water especially during summer months result in the movement of wild animals outside the sanctuary in search of water and are killed in accidents or get hunted by the villagers. The habitat quality of the area need to be improved by creating artificial water holes, well dispersed throughout the sanctuary as well as digging of few tube wells so as to facilitate the water supply to these water holes during pinch period. The pucca checkdams and anicuts constructed under soil & moisture conservation works will also serve as water points to curtail the pinch period during summer.

General Strategies:

i) The new water holes are proposed looking into the requirement of water in different habitats and ensuring proper dispersal of animals evenly as well as utilization of grasses in whole of the area.

ii) The existing water points should be desilted regularly so as to maintain their capacity of holding

iii) In case of famine water holes should be regularly filled with water using tubewells and transporting water, if required.

iv) Installation of Solar pumps/hand pump near existing chowkis. These pumps will provide water to the staff as well as for wild animals.

v) Deepening and maintenance of existing old wells in the sanctuary area is to be carried out periodically, preferably once in 3 years. The deepening and maintenance should be completed by the end of month March every year.

vi) Construction of guzzlers should be given top priority. The guzzler tanks should have capacity to store at least 1.00 Lac litre of water, which can be utilized from October to June. Thirty Guzzlers are proposed to be constructed in the sanctuary area during plan period.

vii) Tubewells with solar /generator sets is to be installed in sanctuary area to ensure water supply to the water holes as well as transportation of water, especially during pinch period.

viii) Anicuts constructed in the sanctuary area during previous years should be properly maintained and repair work should be carried out as and when necessary.

ix) Intensive drainage line treatment (DLT) works should be taken up to ensure conservation of moisture in the area. DLT works should be carried out in Nallahs traversing through the sanctuary area.

x) Big and medium anicuts are proposed to be constructed during plan period.

xi) One tractor with trolleis& water tankers of 1000 Ltrs. capacity which can be attached with tractor is to be Purchased to transport the water to waterholes during pinch period or drought conditions for each Range.

xii) Emergency Funds are to be kept in acute drought to meet supply of water requirement for animals.

6.3.14 Theme Plan for Development Of Prey Base In Poor Wild Life Areas.

Many pockets of Phulwari Ki Nal Wildlife sanctuary area have depleting prey base because of intensive biotic pressure. Due to low prey density, the carnivore population is very sparse. Sufficient prey base is required for growth and sustainability of large predator like panther. Tiger is to be introduced in future so creating sufficient Prey base is must

Villages situated around the sanctuary and cattle population is the main source of biotic interference, which has resulted in degradation of the habitat.

Strategy & Action Plan:

i) 1000 hectares area every year is to be selected for four years and intensive measures should be taken to develop good quality of grasses and fodder yielding species. These areas should be made panther proof by erecting wall of at least ten feet height.

ii) The area should have potential for providing water, food and shelter round the year.

iii) Soil & moisture conservation works should be undertaken in the enclosed area to improve the soil and water retention to facilitate better growth of vegetation.

iv) Check dams of both kind 'Kuchha' & 'Pucca' should be constructed in the nallahas. Drainage line treatment works are to be taken up.

v) V-ditches, contour trenching & contour dykes with sowing of grass seed should be taken up in the area.

vi) Small trails should be constructed in the area for carrying out field inspection, which after the development of area will serve as 'Nature trails.

vii) Pasture development works should be taken up in closed area to ensure availability of fodder to herbivores.

viii) Surplus Sambar, Chittal and other prey base from Udaipur zoo and other places should be relocated.

ix) Predator proof enclosures should be constructed inDesuri range for prey agumentation.

6.3.15THEME PLAN FOR ECO-TOURISM

"Eco tourism" is responsible travel to natural areas which conserves the environment and improves the welfare of local people"

Eco tourism is generally described, as tourism associated with the sanctuary areas and eco-tourism is a word, which has been coined for nature and wildlife tourism. Eco-tourism aims at providing eco tourist with nature tourism opportunities and also aims at generating economic returns to strengthen the sanctuary areas and augment economic benefit to local people.

Phulwari Ki N wildlife sanctuary is one of the important sanctuaries of Rajasthan from Eco-tourism point of view. It has

rich faunal and floral diversity, which provides ample opportunity to visitors to enjoy the nature. The rich cultural and historical heritage of the area attracts people from other states of India as well as from all over the world. The tourist traffic in the sanctuary area has been growing from one year to another sccussesive year.
Issues Related to Promotion of Eco-tourism:

Following are the issues related to encouraging local participation in Eco-tourism:

i) Local participation.
ii) 'Empowerment' as an objective.
iii) Creating Stake holders.
iv) Linking benefits to conservation.
v) Understanding site specific conditions
vi) Monitoring and evaluating the activities.

Eco-Tourism Strategy:

(a) Survey of Potential Sites for Camping & Trekking

i) Camping sites should be identified.
ii) Identifying and displaying the historical importance of the area.
iii) Use of existing buildings & to develop infrastructure facilities in them for comfortable stay.
iv) Trekking routes should be explored and maintenance of existing routes should be ensured
v) New recruits in the department should be given basic training of ecotourism.

(b) Operation of Camping Sites:

i) Trekking equipment required in the forest area to be identified and processed for hiring out.

ii) Intensive training to guides to interpret the natural features present in the area.

(c) Signage:

i) Proper signage to be put up inside the forest area giving details of flora, fauna, historical sites, detailsof naturalfeatures, medicinalplants etc. Besides this map showing tracking routes should be put at entry points in sanctuary area.

ii) Hoardings to be put up on Bus stand, Railway station and on highways to publicize the camping/tracking facilities available in this area.

iii) Hoarding &Signage's mentioning Do's & Don'ts be put up on at the main entry, at viewpoints and at places developed for resting during the tracking.

(d) Publicity:

i) Colorful informative brochure and folders to be brought out focusing on Eco-tourism of each specific area. Activities of Do's and Don'ts related to sanctuary should be included in brochure.

ii) Trees and shrubs should be labeled.

iii) Signage's bearing paintings of animals & birds should displayed at other tourist places

6.3.16 Theme Plan for Nature Interpretation

Nature interpretation center facilities are not available at wild life sanctuary Phulwari Ki Nal. A good interpretation centre is very essential looking to the location and tourist importance of Phulwari Ki Nal sanctuary. It will provide all relevant information about rich cultural & historical heritage, floral and faunal biodiversity of the area that a visitor might like to have. A nature interpretation centre atKotra and at Panarwa is needed to be constructed.

Strategy & Action Plan:

It is proposed to develop a nature interpretation centre at Kotra and at Panarwa. Following activities will be carried out while developing this interpretation centre:

Exhibits;

i) The interpretation centre will be used for depicting natural, cultural & historical aspects of the area.

ii) A map of the area showing important places of tourist interest in and around sanctuary area.

iii) A map of the sanctuary showing important features, tracks for visitors and population density of major wild life species of the particular area of the sanctuary.

iv) Exhibits showing mammals, birds, reptiles, amphibians, which form the faunal population of the sanctuary.

v) Exhibits showing invertebrate animal such as molluscs, insect's etc. found in the sanctuary.

vi) Exhibits of common trees, plants, flowers and other interesting botanical features peculiar to the sanctuary.

vii) Exhibits of food chain and food web in the sanctuary area.

viii) Exhibits on rare & endangered species protected in the sanctuary.

ix) Exhibits dealing with conservation issues such as 'role of forests in Hydrological Cycle' and the importance of

conserving the fragile ecosystem, importance of water conservation, harvesting rainwater etc.

x) Exhibits dealing with the objectives, activities and conservation action plans of the sanctuary.

xi) Exhibits providing tips on do's and don'ts while visiting the sanctuary.

The above exhibits at the interpretation center properly designed and installed with relevant information's& contents will serve as powerful tool to orient the visitors regarding rich historical, cultural & natural values of the sanctuary. It will give them an idea and insight regarding the features to look for and assimilate while in

the sanctuary on one hand, whereas on the other hand it will help them in identifying some of the floral & faunal species with which they come across while visiting the area. The interpretation centre would also serve as a post visit resource center, where visitors could come back and check and verify their observations (e.g. identification of species) with the exhibits.

Resource Material for Conservation Education;

i) A guide map showing the various areas of the sanctuary to be visited, major flora and fauna to be observed at each location and the nature trails available to track.

ii) Interpretation material in the form of orientation maps, information leaflets, checklist of floral and faunal species

etc., which will go a long way in assisting the visitors to take maximum advantage of their visit.

iii) Trail guides for nature trails could be prepared.

iv) The Interpretation centre will act as strong tool for nature guides, which in turn will be able to provide knowledge about nature interpretation to the visitors.

v) Information guides on natural, historical and cultural heritage of Phulwari Ki Nal.

vi) The interpretation centre will also serve as an environment education centre for the local schools and general public.

It is estimated that Rs. 60.00 Lac will be required to develop the exhibits. Serious efforts are required to be made testablish the interpretation centre as early as possible in benefit of sanctuary & visitors.

6.4.17 Theme Plan for Education & Awareness Programme-

Extension and awareness generation has been remained weakness of the wild life wing. Therefore it is very essential to have a proper extension network to promote education and awareness towards wild life protection and conservation among the villagers and local inhabitants living around the sanctuary area. For this following activities are proposed to be taken up during the plan period:

i) Development & dissemination of publications, pamphlets, poster and other publicity material.

ii) Organization of exhibitions, puppet show, video film show etc., both for rural &urban population.

iii) Involvement of schools, colleges and other educational institution will be encouraged.

iv) Exchange visits programmes for wild life personals, extension workers and local self-government representatives of villages around the sanctuary.

v) Publicity through Social Media,Television and press release etc. will be given priority.

Strategy:

The overall strategy for education and awareness programme is to provide educational inputs at various levels to support the execution of development programme and conservation of existing resources in the sanctuary area. The environment education and awareness programmeaims to achieve following objectives through design and implementation of appropriate communication methods and appropriate approach:

i) Create an understanding for protecting the natural forests in the sanctuary area for the cause of indirect and crucial benefits to the local communities on one hand and to the entire region on the other.

ii) Create an understanding among the local people & general public about the importance of establishment of sanctuary & role of Forest Department in its development & protection.

iii) Creation of knowledge base about flora, fauna and natural features of the sanctuary.

iv) Help general public to understand and appreciate the local communities' relationship with the existing natural resources.

v) Create wide spread understanding of eco-development of surrounding forest areas as the most crucial element in the protection strategy.

vi) Increasepeople's willingness to accept new technology and practices through their understanding of environmental dimensions.

vii) Develop interpretation centre for visitors within limits of sanctuary.

viii) Wide publicity to eco-development programmes to generate public support.

Contents:

The contents of environment education programme are derived from its overall objectives of increasing all around awareness to participate in the efforts of conservation and development of the sanctuary. The contents will include:

i) Benefits of conservation especially to the people living around the sanctuary.

ii) Importance of wildlife sanctuary locally and regionally, especiallyas the spot of bio-diversity.

iii) Historical, geographical, floral and faunal information in context of wild life sanctuary Phulwari Ki Nal.

iv) Ecological significance of the sanctuary.

v) Threats and opportunities available at sanctuary.

vi) Protectionissues in context of sanctuary.

vii) Augmenting people and non-government institution support for protection of sanctuary.

viii) Environmental dimensionsof the present livelihood activities of local people.

ix) Some basic concepts such as natural resources, bio- diversity, forest & wild life.

x) The ecological, economics, aesthetic and educational value of the sanctuary.

On the basis of above themes, specific programme for specific group of people

Target Groups:

The whole programme will be aimed to facilitate learning, understanding and acquiring skills and will involve groups at many levels since all these groups directly or indirectly effectings the conservation and development programme of the sanctuary. The groups, which will participate in the awareness programme, will include:

i) The men, women and children of local villages surrounding the sanctuary.

ii) The people and institutions of Udaipur City.

iii) Village/Panchayat level functionaries.

iv) School children & teachers.

v) Staff of sanctuary involved in protection and development of sanctuary.

vi) Researchers and institutions.

vii) General public in the nearby areas and others.

Media Forums:

The selection of communication medium will depend upon number of factors, which includes the theme, message and the audience. Besides this availability of resources, expertise and time will be other factors influencing the communication mode. Following media are proposed to be used as communication means subject to availability of resources.

PROPOSED MEANS OF COMMUNICATION STRATEGY

I	Print Medium	Poster, Pamphlets, Wall slogans, Newspapers.
II	Audio Visuals	Video programmes, Films.
III	Exhibitions	At fairs & in selected villages.
IV	Mass Media	News Papers Magazines, Social Media , Radio & T.V. channels and Internet.
V	Other Media	Puppet shows, exposure tours & Eco-camps.
VI	Forums	Interactive forums such as meetings, committees, seminars, workshops, interpretation centre.

VII	Training Programme	To local people about conservation values. To Teachers and school children. To Forest Department personals for Eco-activities. Training for trainers to Conduct above programmes.

6.4.18Theme Plan for Techniques of Population Estimation

Wild Life census plays a vital role in scientific management of sanctuary area. The census is not only a powerful tool to evaluate the management practices in past but also provides a vision for future management practices to be adopted in welfare of sanctuary and in particular that of wild animals. Census in wild life terminology deals with the estimation of abundance of animal population. The simple set of objectives: "Absent, rare, occasional, common, abundant" is a measurement of presence of particular faunal species. Census methods can be split into those dealing with observations on actual individuals and those based on other evidences, a distinction, which is referred as direct and indirect methods of census. The important thing to know in census is the pattern of distribution of animals.

Census: Current Status

In wild life sanctuary Phulwari Ki NalPanther is at the apex of the biological pyramid of food chain and its existence depends on availability of sufficient prey, which in turn depends on forest and grass lands. The habitat of wild life sanctuary Kumbhalgarh falls under category of "Dry deciduous Forest" and such forests are more productive and richer in terms of forage production than any other habitat. The foremost priority therefore is to maintain and upgrade the availability of forage and save it from overgrazing and competition from domestic cattle. If the population of ungulates is sufficient the panther will also survive and prosper.

At present the census of the panther and ungulates is carried out through biannual census. Following methods are used for census operation:

i) Tracking followed by pugmark methodology for Panther and other carnivores.

ii) Water hole counting for ungulates and other animals.

Strategy & Action Plan:

i) The area of wild life sanctuary is divided into counting units for census purpose. The present number of census units is sufficient enough and should be retained for future years.

ii) In "Pug mark - Census method" pug mark impressions of Panther and other carnivores are identified and taken using "Plaster of Paris" along with information of location date and time. For the purpose the current practice of

tracking and collection of pugmark impressions at water hole should

iii) For census of ungulate population "Water holes" present in the sanctuary acts as unit of counting, which gives a fair idea of ungulates population in the sanctuary. The method is again recommended to be continued.

iv) It is proposed that by using GPS system the location of panthers and density of ungulates should be marked on the map of sanctuary.

v) Standard terms for collecting the field data in vogue should continued to be used.

vi) The staff to be engaged in census operation should be given regular intensive training for taking pug mark caste and tracing and subsequently identification of species.

vii) Present practice of involvement of students of schools and university research scholars and NGO's in census operation should continue and more volunteers should be encouraged to participate.

viii) Census of wild animals outside the sanctuary area should also be taken care off. The territorial staff should be provided with intensive training about census methodology & identification of wild animals.

ix) The census operation should be given wide publicity in newspapers.

x) The data collected and analyzed from the field should preservedfor future reference.

xi) A long-term research study about population dynamics, prey-predator relationship and the dispersal of major prey species is the need of time.

The financial requirement for carrying out biannual census in sanctuary area and other territorial areas will be around RS. 4.00 Lac every year.

6.3.19 Theme Plan for Training

Training to staff personnel involved in management of wild life sanctuary pertaining to wild life management and other related disciplines is essential for scientific management. The officer in-charge of the sanctuary is Asstt. Conservator of Forests and they are regularly transferred. Similarly the subordinate staff like Range Osfficer, Foresters and Forest Guards are also transferred. Thus, the system does not have a continuity of trained staff.

The staff personnel posted in wild life sanctuary is traditionally the most primitive of the Forest Department. Wild life management now a days has emerged as a science, and scientific management of sanctuary areas has become most essential element to conserve and rehabilitate the rich biodiversity present in the sanctuary area. The staff is expected to digest the most advance scientific principles of "bio-diversity conservation", "gene pool", "Ecosystem", "Population dynamics" and "recent census techniques to estimate the population" etc. To entrust them with the task, they required certain level of training and education. Apart from this, because of strategic location of sanctuary the staff has also been burdened with additional pressure of dealing with villagers residing on periphery of sanctuary, protocol duties etc. The staff also lacks regular training required to keep them fit for action against miscreants. All these factors lead to generate the importance of "Basic skill development" training to field staff. Most of the staff of sanctuary is not trained in the matter of wild life protection, conservation and management related subjects.

Specialised training of the staff is essential to tone up their skills from time to time.

It is proposed to carry out regular training programmes in the field at state level training institute as well as at reputed specialised Institutes of the country. The training course can be of short or long duration depending upon the course contents. The "Training" should be made compulsory and in no case staff should be encouraged to skip the opportunity available.

Likely areas of training can be:

i) Nature interpretation & Eco-tourism.
ii) Field Botany along with Medicinal plants & their uses.
iii) Avifauna.
iv) Population dynamics.
v) Regeneration of various species.
vi) Wild Life Laws.
vii) Forestry Laws.
viii) Animal health & Nutrition.
ix) Advanced techniques of wildlife management.
x) Techniques of carrying out wild life estimation/census.
xi) Techniques of Eco-development.
xii) Extension & communication techniques.

The above list of subjects to be covered during training is suggestive one. More and more topics can be incorporated in training schedule to aquatint the ground functionaries. Besides this

short term courses atfield level should be held at sanctuary itself to impart basic skills to field staff.

The financial requirements for impartingtraining tostaff at various levels is as follows .

THE FINANCIAL REQUIREMENTS FOR IMPARTING TRAINING TO STAFF

S.No.	Module	Financial Requirement (RS. in Lac)
1	Internal training for subordinate staff per year	10.00
2.	Institutional Training for DCF/ACF/Range Officer/Foresters & Forest Guards per year	12.00
3.	Educational tripsand staffvisit to other sanctuaries (twice a year)	12.00
	Total	**34.00**

6.3.20 THEME PLAN FOR MANAGEMENT INFORMATION SYSTEM

The present age is the age of information and communication skill. The efficiency of organization depends upon its Management Information System (MIS). It not only helps managers at various levels in organization but also helps in dissemination of information to the society. The information system in the present age of Internet is beyond imagination.

Identification of Problems related to MIS:

i) Retrieval of Information is slow.
ii) Repetitive processing of information manually.
iii) Delays in transfer of information.
iv) Erratic reporting of information.
v) Lack of standard formats.
vi) Noncompliance of the schedules.
vii) Staff not well versed in handling the modern implements like computers and internets.

Areas Requiring Special Attention

i) Forest & Wildlife protection including monitoring forest & wildlife offences and court cases.
ii) Settlement and demarcation including monitoring of encroachment cases.
iii) Information related to establishment matters including deployment of staff.

iv) GIS based resource inventory including wild life and development works.

v) Management plan and perspective planning.

vi) General Periodic returns.

vii) Annual Plan of operation, Budgeting, Monitoring & Evaluation.

viii) Resource inventory such as vehicles, arms, wireless network and other

ix) Eco-tourism activities.

x) Documentation of resources.

xi) Environment awareness Programmes.

xii) Inventory and information related to villages around the sanctuary.

xiii) Information relating to registration of arms, and licenses issued under Wildlife (Protection) Act, 1972.

Action Plan for Management Information System:

i) Information needs at different levels will be identified.

ii) The data source will be identified.

iii) Standardised format for collecting and recording data will be finalised.

iv) Communication network for information transfer and feedback is to be identified.

v) Periodicity of data input and transmission of information will be standardised.

vi) Formats for reporting will be finalised as per the needs of different levels.

vii) Naka, Range & Divisional notebooks are to be maintained regularly. It is expected that happenings in sanctuary should be recorded in these books by forester, R.O. and D.CF respectively. Any deviation and lapses should be viewed seriously.

viii) At each Naka level, village information record under their jurisdiction should be maintained.

ix) Record of wild life offence cases and offenders should be maintained at division and range level.

x) Computer based GIS framework will be used for inventory and management purposes including monitoring and evaluation.

xi) The divisional office, ACF's and sanctuary Incharge R.O.'s office should be provided with computer facilities and Internet connections.

xii) Additional post of Data Entry Operator, may be on contractual basis should be provided at divisional & sanctuary level.

xiii) Efficacy of MIS will be periodically reviewed and the necessary alternations in the system should be made as per the requirement.

Management Considerations:

While designing the MIS following steps should be taken into consideration;

i) Basic character of data collected at field level should remain the same.

ii) Repetition of items of input information should be avoided.

iii) Format of output data should be kept similar as far as possible.

iv) Data should be easily accessible. The staff at all level should be ableto collectthe input data easily, only, with some orientation and training suited to his level.

v) The programme be introduced in phased manner and improved according to needs.

CHAPTER-7
RESEARCH, MONITORING AND TRAINING

7.1 RESEARCH

Research stands out as a significant concern in the Plan Outline of the Management Plan document. The document anticipates that the sanctuary's scientific team will conduct foundational research initiatives focused on assessing systematic factors and influences, in order to develop practical management strategies for specific populations and the overall ecosystems. Effective management of wildlife protected areas greatly relies on research. Utilizing research-based wildlife management is essential for the prosperity of any protected area. This is a valid endeavor and should align with the wildlife management goals set for the protected area. The protected area requires a well-defined wildlife research policy that prioritizes the following areas.

7.1.1RESEARCH PRIORITIES

Wildlife management combines practical skills and scientific methods grounded in field studies. Research within Protected Areas (PAs) should prioritize critical information needs that are generally applicable to most of these areas. Individual researchers

focusing on specific topics or species without collaboration can make minimal contributions to effective wildlife management. The research should involve "problem-solving studies" that are developed through a collaborative process with PA management, local communities, and the actual circumstances present in our tropical environment. Certain "pressure points" for PA management are shared across many of our protected areas, and besides the ongoing short-term projects, wildlife research in Phulwari Ki Nal Sanctuary should ideally center on these issues.

PA Managerial Priorities	Research Areas
A) **Values Relating to PA :** 1. Ecological/ Regional landscape	• Regional changes in species richness & diversity • Changes in species occurrence • Effect on water table • Habitat fragmentation • Endangered species: prey base, age/ sex ratio, biomass computation, life table computation
2. Habitat degradation	• Types of exotic infestation

	• Control methods
• Livestock depredation by carnivores & crop damage by wild ungulates	• Reasons for livestock depredation • Percentage of livestock in the food-spectrum of carnivores • Reasons for crop damage
4. Habitat management practices	• Biodiversity conservation vis-a-vis management practices in-vogue
5. Poaching	• Magnitude • Modusoperandi (variations) • Wildlife crime intelligence and networking • Wildlife crime prevention
6. Fire	• Nature and efficacy of existing preventive and control measures • Changes in the habitat due to fire • Changes in animal use pattern due to fire

7. Insects as agents of ecological change	• Impact (magnitude) • Ecological changes • Periodicity
8. In-situ conservation	• Founder population size • Translocation
9. Eco-tourism	• Involvement of host-communities • Mechanism • Impact assessment
10. Jurisprudence	• Morphological studies • Biochemical studies • DNA fingerprinting
11. Wildlife disease	• Landscape epidemiology studies • Linkages between sylvatic & pastoral cycles
12. Animal monitoring and estimation techniques	• Customization of software • Estimation procedures, indices for various species • Home range studies •
Study of Wetland	• Vegetative succession

	in the entire wetland, especially in regard to weed invasion in draw down area. • Detailed ecology of the fauna of the wetland, especially invertebrate fauna • Effect of agricultural and other practices in the catchment area of Sanctuary.
• **Biotic Pressure on PAs:** Vision beyond the PA Interface problems	• Effect of existing land use • Mechanism/ strategy to mitigate ill effects • Magnitude of crop damage outside PAs • Methods for mitigation • Decadal population growth in impact zones outside PAs (human/ cattle) • Resource use pattern of indigenous people • Impact of PAs on indigenous people • Legal status of the

	impact zone & related problems • Community role in conservation • Levels of sustainable use • Grazing impact • Regeneration status in right burdened forests • Impact of rights and concessions on habitat quality • Socio-economics of indigenous community • Resource requirements of indigenous people & dependencies • Traditional knowledge & occupation of indigenous communities • Impact assessment of Eco-development woks

In addition to the biological and ecological research mentioned earlier, park administration should promote the gathering of pertinent information regarding the impact of the protected area on the local economy and the communities in nearby villages.

These social research initiatives should also be transformed into reports, status papers, micro-plans, and other documents that lead to the formulation of effective policies aimed at the upliftment and eco-development of local communities. While these social initiatives may appear to be purely academic or bureaucratic and might not exhibit any immediate significance for management, they will ultimately hold substantial value, as the current dynamics between parks and surrounding populations in our country are likely to evolve significantly over time.

7.2 Monitoring

The management of the protected area should ensure that monitoring biological resources remains a fundamental routine task in conservation efforts, as it is the primary method for identifying trends or changes and assessing the effectiveness of management interventions. Although this process may seem unstructured and subjective, collecting valuable biological data can be accomplished in a straightforward, systematic, and scientific way. The management should aim to integrate various effective monitoring activities into the regular responsibilities of the staff, along with annual assessments of wildlife counts and related activities. All such information should be regularly incorporated into the Management Information System.

The protected area should maintain its existing system of ecological monitoring for both flora and fauna. As noted, the reserve has an extensive network of forest camps representing all vegetation types and wildlife habitats. Each of these camps is equipped with registers containing predefined formats for data collection that cover the general phenology of various vegetation types, species-specific animal sightings categorized by age and sex, sightings of females with young, lactating females, and more. Additionally, templates for documenting indirect signs of panther presence have been included. From a management perspective, a valuable inventory might be as straightforward as tracking the distribution of key species, as their numbers can signify significant ecological processes. Even basic estimates of these animal populations would enhance the inventory's value. A color photographic guide for identifying animals has been created and shared with all field personnel. Furthermore, a photographic album showcasing various ground flora, including numerous grasses, herbs, and shrubs, should be compiled and distributed to all field staff involved in daily monitoring to assist in the straightforward identification of species from management's standpoint. The data collected through such ongoing monitoring can subsequently be analyzed to reveal intriguing trends, leading to targeted species- and habitat-specific planning within the protected area. The template for the camp register mentioned above is provided below. Each Forest Guard responsible for a

specific camp must complete the necessary information gathered during their daily patrols. This approach will generate substantial data on the essential parameters for managing a wildlife protected area.

The data can be compiled for large carnivores based on camp registers, allowing for the creation of a monthly presence map for panther sightings.

Format of Patrolling Camp Register for Routine Ecological Monitoring

Particulars of Patrolling			Phenology			
Date	Place &Compartment No.	Time	Flowering trees/ Plants	Fruiting Trees/ Plants	Leaf Fall	New Leaves
1	2	3	4	5	6	7

Herd Structure of Ungulates														
Total No. of Herds (Chital/ Sambar/ Nilgai/)	All Male Herd				Female-Fawn Herd				Mixed Herd					
	Adult	Sub-Adult	Fawn	Total	Adult	Sub-Adult	Fawn	Total	Male Adult	Male Sub	Female Adult	Female Sub	Fawn	Total

Various Stages of Antler Development					Birth Frequency of Ungulates (15 days Intervals)		Stages of Gestation	
les with Fallen Antlers	Males with Developing Antlers	Males with Branched velvet Antlers	Males with Developed Hard Antlers	Total	Date	Total NewBorn	Total No. of Pregnant Female	No. of Lactating Females

Data/ Evidence Relating to the Leopard										
Male/ Female Pugmark (No./ Unit Distance Walked)	Urination(No./ Unit Distance Walked)	Scraping (No./ Unit Distance Walked)	Call	Scratches (No./ Unit Distance Walked)	Scat (No./ Unit Distance Walked)	Cattle Kill	Other Kill	Stride Measurement	Straddle Measurement	Signature Inspecting Officer

7.3 Capacity Building

While managing the Phulwari Ki Nal Sanctuary ecosystem is a learning experience for most frontline staff, the Park Management needs to ensure that newly hired personnel receive wildlife training from various institutes both within the State and beyond. Staff members should be motivated to pursue Diploma, Certificate, and Capsule courses offered by the Wildlife Institute of India in Dehradun, applicable to officers down to the Forest Ranger level. Below is the

information regarding the available training and the institutes providing it.

Table

S. No	Course Name	Course Type	Course Duration	Participant Level	Resource person/ org.	Frequency
1	Advance Diploma in Wildlife Management	Diploma Course	Ten Months	A.C.F./DCF	WII, Dehradun	Once
2	Eco-development	Module	Three Months	A.C.F./DCF	WII	Once
3	Wildlife Management	Certificate Course	Three Months	F.R.	WII	Once

Aside from that, Forest Guards assigned to wildlife areas should receive training in wildlife management at the wildlife training center in Jaipur. In addition to this fundamental training, several essential courses are needed for staff and officers to effectively perform their daily responsibilities.

1. Weapon training -

The personnel may encounter anti-social elements, including hardcore criminals engaged in illegal activities. To maintain effective control, the staff must be armed with modern weapons and ammunition and be trained in their usage. Therefore, comprehensive training on handling arms and ammunition should be regularly provided to field staff.

2. Wildlife Health Monitoring Training

The assessment of wildlife health and the treatment of various contagious diseases require specific technical skills. Staff members must also be knowledgeable about techniques for collecting samples to send to forensic laboratories or to the research center at WII, Dehradun, for thorough analysis.

3. Chemical immobilization training -

It has been recognized that wild animals often stray near human settlements, especially during the summer months. Such occurrences can lead to challenges for both wildlife and humans. Animals that are distressed should be safely captured and released back into the wild after adequate treatment.

4. Tourism and interpretation training

Tourism and interpretation are highly sensitive topics. Even a small act of discourtesy can tarnish the reputation of the Protected Area and the Forest Department. Staff responsible for interacting with tourists should receive proper training to ensure they handle situations courteously. This approach will also help in implementing various rules and regulations related to wildlife tourism and management. Moreover, staff involved in interpretation activities should possess sufficient knowledge about the Protected Area and ongoing initiatives. If tourists do not receive satisfactory answers to their inquiries, the goals of extension and interpretation cannot be fulfilled. Initial training and ongoing refresher courses should be provided for the staff, as there is currently no organized training on tourism and interpretation activities.

5. Computer Application Training:

The use of computer applications and related software has become essential for daily management. Utilizing GIS and other related software, along with understanding their application, could enhance the effectiveness of Protected Area Management. These efforts will only be beneficial if the staff is sufficiently skilled to operate these technologies. Therefore, a three-month capsule course should be organized for selected staff and officers in Jaipur or Udaipur.

In addition to these training programs, other important topics may be incorporated if needed.

Human Resources Development Plan (HRD Plan)

Wildlife management is a specialized field that requires particular orientation, skills, and knowledge. Training is essential for making technocrats and field staff proficient in their roles. Being exposed to commendable efforts made in exemplary sites fosters motivation to reach similar or even higher standards. Furthermore, significant confidence is built when initiatives are recognized and appreciated by others. Thus, initiating training efforts for all staff levels in various relevant domains is a positive step.

Training for field staff and officials stationed in the Phulwari Ki Nal Sanctuary is especially crucial, as they must manage sensitive biodiversity conservation alongside eco-development challenges. Although sufficient technical support and guidance will be provided by relevant experts, regular refresher courses covering diverse topics are recommended for the various staff levels at the Sanctuary.

S. No	Course Name	Course Type	Course Duration	Participant Level	Resource person/ org	Frequency
1	General wildlife management course	Orientation Course	One week	D.C.F./C.F.	WII, Dehradun	Once

1 a	--do--	Orientation Course	10 days	A.C.F./ D.C.F.	WII, Dehradun	Once
1 b	--do--	Orientation Course Module I	One week	Ranger Foresters	Forestry Training Institute, Jaipur	Once
1 c	--do--	Orientation Course	One week	Forest Guard & Cattle Guard	Forestry Training Institute, Jaipur	Once
2	Soil and moisture Conservation	Orientation Course	One week	Ranger Foresters, & Forest Guard	Forestry Training Institute, Jaipur	Once in a year
3	Rural development	Orientation Course	One week	Ranger Foresters, & Forest Guard	Forestry Training Institute, Jaipur	Once in a year
4	Enforcement of Law and Enactment'	Refresher Course	Three days	Range officers Dy. Ranger	Forestry Training Institute,	Once in six months

	s			Foresters & Forest Guards	Jaipur	
5	Education Awareness course	Refresher course	One week	ACF, Range officers, Foresters and Forest guard	WII, Dehradun for DCF and ACF; FTI Jaipur For Foresters and Forest guards.	Once in two year

The senior as well as lower field staff should be exposed to latest trends and developments achieved in different subjects related with wildlife manage

ment. Such exposure would help the field staff to carry out various management practices for effective management. A regular short- course requires to be organized from time to time for the ground level field staff to impart technical expertise to carry out various routine works, like; population estimation, water hole management, wildlife habitat management and the like.

To impart training in the above topics and other useful subjects, the selected staff should be sent to Forestry Training

Institute, Jaipur, for witch funds and equipment has to be provided.

Conducting Study tours at par-excellence sites: -

- Eco-development study tour for EDC members and associated staff
- Wildlife management study tour for Officers & field staff.
- International study tours
- Working visit for PA Officers

Workshops and Field Study: -

Every year, workshops and field studies should be conducted at the Protected Area (PA) level to share experiences gained from fieldwork and to spread knowledge and practices that have been successfully implemented in other PAs. Some potential topics for these workshops and field studies could include -

- Monitoring wildlife and its habitat, along with understanding the purpose of data collection during routine patrols.

- Techniques for conducting wildlife censuses and field surveys.
- Anti-poaching measures, legal processes, and forensic science.
- Micro-planning for eco-development in neighboring communities.
- Training in fire protection.
- Managing EDC accounts.
- Promoting environmental education and awareness.
- Workshops for PA planning.
- Workshops for regional planning.
- Workshops for finalizing PA management plans.

In these workshops and field training sessions, regular interactions and discussions between officers and field staff would enhance the understanding of new perspectives related to wildlife management.

7.3 Control Forms

Progress of the plan activities sanctioned will be monitored regularly at division level. Control forms will be designed for keeping track on annual progress of plan activities, implementation of strategies & bottlenecks faced during implementation phase, evaluation of prescriptions, inputs ad problems. All the information

regarding plan operations will be furnished in standard formats. Records will be maintained at division and Range levels.

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CHAPTER-8
ORGANIZATION ADMINISTRATION & BUDGET

8.1 Establishment of Steering Committee -

As per the requirement of act the process of constituting steering committee for ensuring, co-ordination, monitoring, protection and conservation of large carnivores and prey animals is in progress.

8.2 Co-ordination with Line agencies / Departments

Co-ordination with line agencies / departments are needed for: -

→ Better protection

Police, revenue, railway authorities, Judiciary etc.

→ Eco-development

Revenue, Rural development, Agriculture, health, Veterinary, Horticulture, Jila Panchayat, Women and child development, PHED, Education, Tribal welfare etc.

→ Gaps in habitat development

Jila Panchayat, Rural development, Agriculture etc.

→ Conflict resolution

Revenue, Police, Tribal welfare, Judiciary etc.

It is evident from above that co-ordination can be obtained in many ways and in many fields. Better co-ordination will not only ease pressure on limited resources of reserve management but will earn general goodwill among various sectors.

For co-ordination following measures could be adopted:-

- Regular meetings with line department.
- Co-coordinating with District Collector and CEO, ZP for organising special meetings with line departments.
- Knowing various schemes of line departments and identifying schemes suitable for the PA area.
- Reserve tour of officials of line departments.
- Accreditation and highlighting achievements of other departments in PA area.

These are few suggestive things, but in practice convergence could be achieved only through good interpersonal relationship with officials of line departments of various levels from district to village. Officer of PA should interact with their respective counterparts in other departments.

8.3 HRD/Staff Deployment

Looking into different aspects, extent of area and difficult terrain the present staff is insufficient. So to overcome these problems it is proposed to increase the strength of staff as mentioned below in Table 8.1

Table: 8.1
The proposed strength of staff for protection of Sanctuary

S. No.	Name of post	Available strength	Proposed strength	Vacant
1.	ACF	1	1	-
2.	Range officer	3	4	1

3.	Forester	2	12	10
4.	Astt. Forester	3	12	9
5.	Forest Guards	35	60	25
6.	L.D.C	-	4	4
7.	Driver	-	2	2
8.	Class IV	-	4	4
9.	Chowkidar	-	2	2

8.4 Fund Raising Strategies

Presently the Phulwari Wildlife Sanctuary gets funds from "Non Plan" to meet out the expenditure on establishment. To carry out the development activities in sanctuary area under central sponsored scheme (100%) funds are provided.

The budget requirement of this management plan can be broadly classified into following categories:

i) Establishment cost:

The present mode of bearing establishment cost through "State Plan" or "Non Plan" should continue. Expenditure on Salary, T.A., Medical, Office expenses & running of motor vehicles should be met from the existing budget heads.

ii) Activities proposed in management plan:

State government has limited financial resources. Hence the expenditure required to carry out the development works proposed in management plan are to be met through "Central Sponsored Scheme" (100% share).

8.5 Schedule of Operations

Year wise physical andfinancial requirements are submitted for consideration as Annexure 47.

8.6 Plan Budget

The budgeting for the plan period (2025-26 to 2034-35) for various components of management plan has been done and attached as Annexure 47.

Part B

Suggestive Prescriptions for management of the Peripheral Zone of Influence (ZoI)

B1 – Eco-Sensitive Zone

1.ESZ description and extent

The Phulwari Ki Nal Wildlife Sanctuary is well protected, exploring full range of habitat in Aravalli range. It isimportant from geographical point of view as it constitutes Teak and Rosewood in a fairly good percentage. Phulwari Ki Nal Wildlife Sanctuary is ecologically important as it forms a part of the largest viable forest tract among the fragmented forest belt of Rajasthan. It is pro-runner to Mount (Mt.) Abu Wildlife sanctuary onwestern direction. The vegetation closely resembles with that of Mt. Abu, only exception being that of Indrok (Anogeissus sericea) which is in abundance in Mt. Abu and is in very small number in Phulwari Sanctuary. Hence a draft notification, declaring Eco-sensitive Zone around Phulwari Ki Nal Wildlife Sanctuary in Rajasthan, was published in the Gazette of India, Extraordinary, vide notification of the Government of India in the Ministry of Environment, Forest and Climate Change number S.O. 4217 (E), dated the 22nd September 2023, inviting objections and suggestions from all persons likely to be affected thereby within a period of sixty days.

After considering all the objections received final notification of the ESZ notified on 17th May, 2024.

The Eco- sensitive Zone covers an area of 202.3431 square kilometer with an extent of zero to 1.0 kilometer from the outer boundary of Phulwari Ki Nal Wildlife Sanctuary. As many as 147 villages falls within boundry of Eco-sensitive Zone. Extent of ESZ is as below.

North	1.00 km
North-East	1.00 km
East	1.00 km
South-East	1.00 km

South	1.00 km
South-West	Zero*
West	1.00 km
North-West	1.00 km

**Phulwari ki Naal Wildlife Sanctuary shares a common border with the State of Gujarat at some places, due to which the extent of Eco-Sensitive Zone on the common border between the States of Rajasthan and Gujarat has been considered as zero.*

The population around the sanctuary area is mainly agriculturist, pastoralist and labour class. Low rate of literacy, socio economic backwardness and poverty make them dependent upon the natural resources available in sanctuary area especially for grasses and fuel wood. The area is rain fed with minimum irrigational facilities. Villagers practice primitive agriculture methods. Erratic rains and frequent draught has adverse impact on their economy. They have small land holdings and that too on undulating terrain which are mostly unsuitable for agricultural practices. The main Kharif crops are maize, urad, moong, toohar etc. and where irrigation is possible wheat, gram, mustard etc. are grown as Rabi crop.

Agriculture, animal husbandry, collection of NTFPs, Labour work etc. are the main occupation. Irrigation facilities are poorly developed. Rabi crops are grown on a small scale along natural water courses. Traditional irrigation system called' Haran' is practised by plugging these water courses and by constructing a water channel at contour. Water pumps are being also used for irrigation.

No industry is present in Kotra and Jhadol Tehsil. Unemployment, poverty, illiteracy etc. are main problems. Most of cattle is either dry or produce very less quantum of milk. 'Deshi' poultry is reared by each tribal family. Other vocations of the people include the labour works at various sites of government agencies.

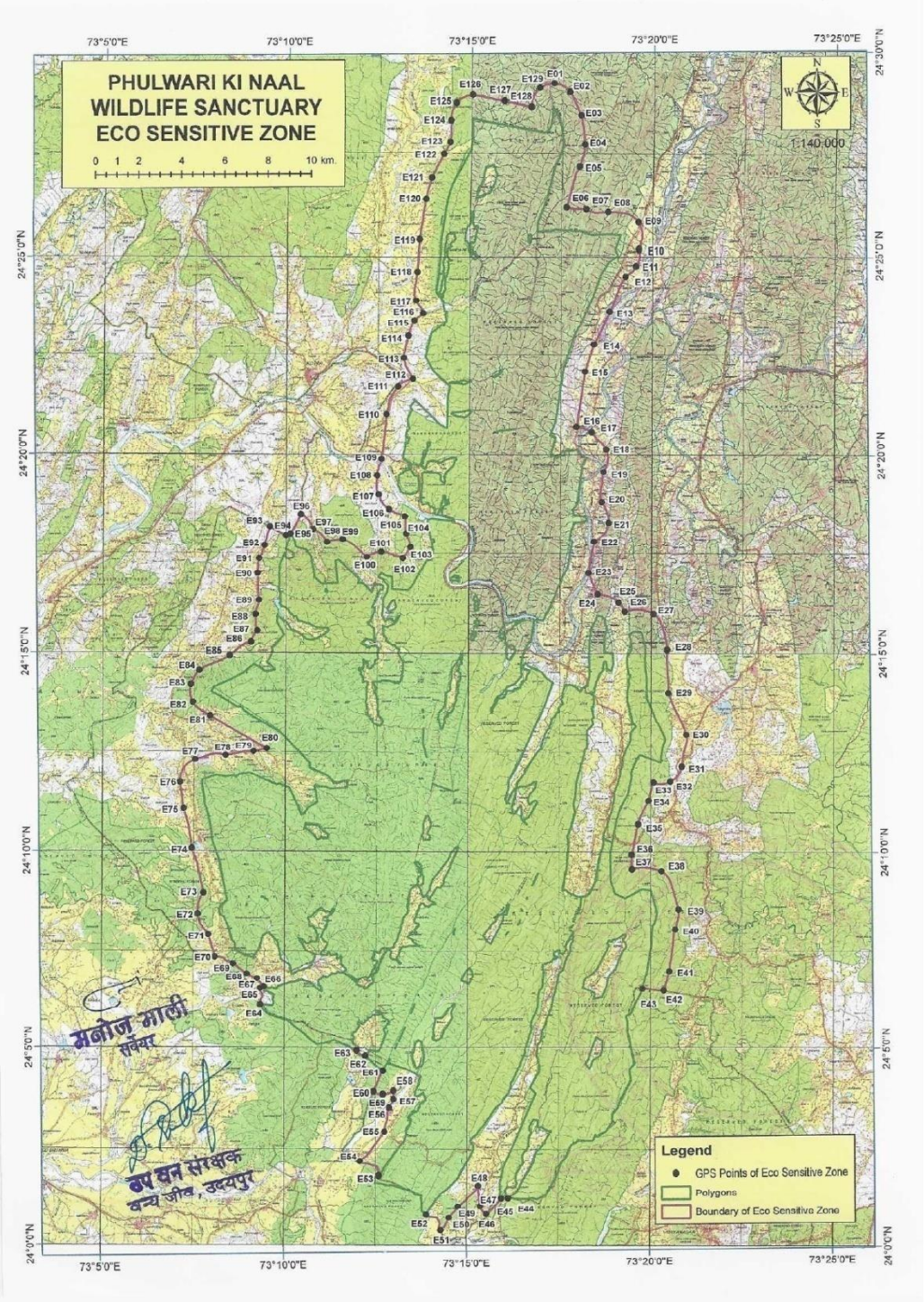
Tribal population of the area depend upon agriculture, forests, cattle rearing and labour oriented works. Intricacy of tribal with forests is remarkable. They fully depend on forests for housing, fencing material, fodder, wild fruits, agricultural

implements etc.

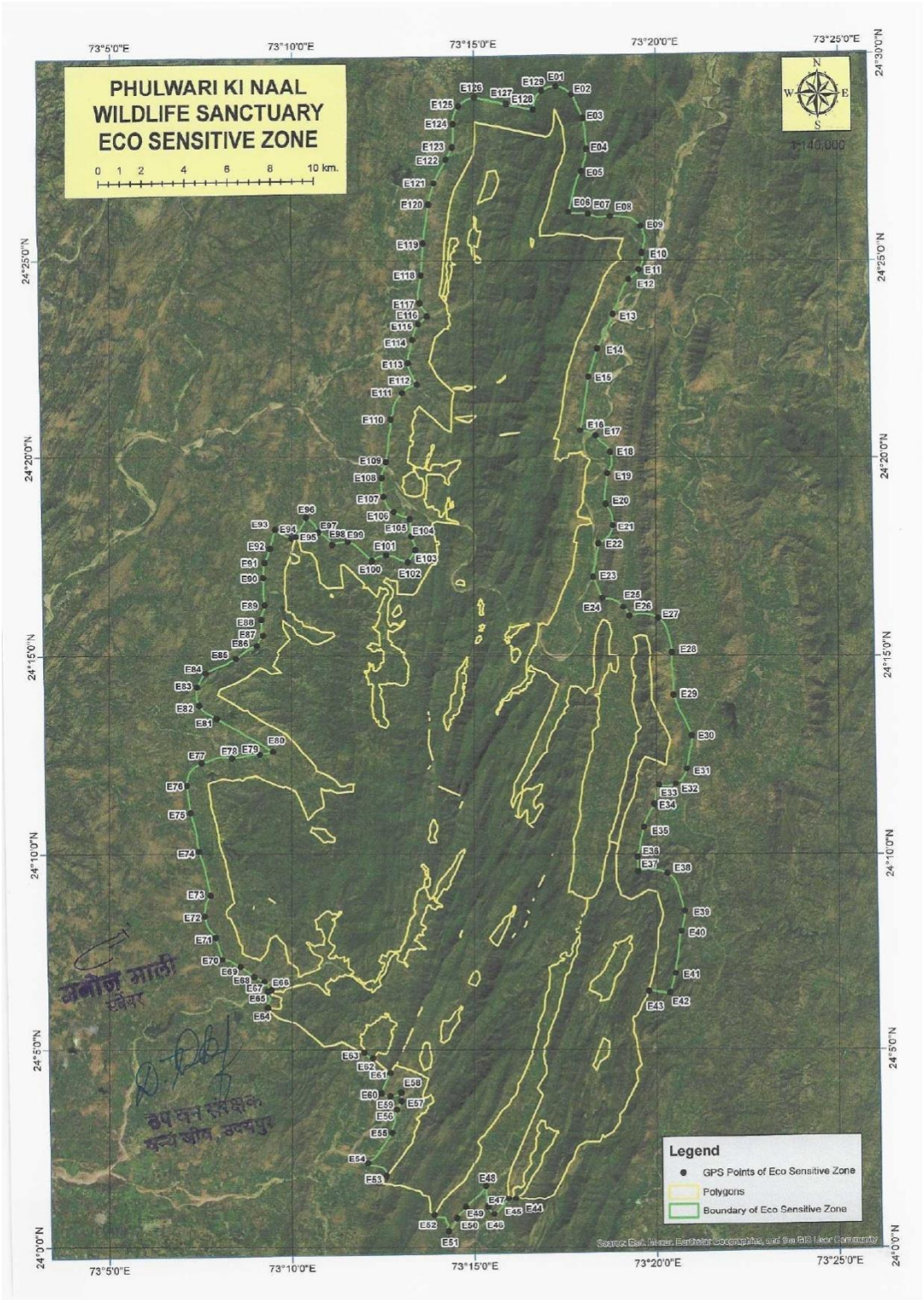
Employment to local people is generated in the field of agriculture, animal husbandry, collection of non-wood forest produce and labour oriented works in various, government and private sector. Economic condition of local people is pitiable. Most families have small land holdings. Irrigation facilities are meagre. Cattle quality is poor and less productive.

Tribals still practice the old agricultural methods. Erratic rains and Frequent droughts have shaken their economy. They have small holdings and that too undulating which is mostly unfit for good agricultural practices. The main crops are maize, urd, moong, etc. and where irrigation is possible, wheat, gram, mustard etc. are also grown as Rabi crop. No NTFPs are auctioned in the sanctuary. By the Supreme Court's order, no forest produce is to be removed out P.A.s.

Survey of India topo sheets of the ESZ area with demarcation of the boundary of Sanctuary and the ESZ area



Satellite image or Google earth image showing the distinct land use features



2.List of activities prohibited or to be regulated within the Eco-Sensitive Zone

All activities in the Eco sensitive Zone shall be governed by the provisions of the Environment (Protection) Act, 1986 (29 of 1986) and the rules made thereunder including the Coastal Regulation Zone (CRZ), 2011 and the Environmental Impact Assessment (EIA) Notification, 2006 and other applicable laws including the Forest (Conservation) Act, 1980 (69 of 1980), the Indian Forest Act, 1927 (16 of 1927), the Wildlife (Protection) Act 1972 (53 of 1972), and amendments made thereto and be regulated in the manner specified in the Table below, namely:-

TABLE

S.No.	Activity	Description
A. Prohibited Activities		
1.	Commercial Mining, stone quarrying and crushing units.	(a) All new and existing (minor and major minerals), stone quarrying and crushing units are prohibited with immediate effect except for meeting the domestic needs of bona fide local residents including digging of earth for construction or repair of houses and for manufacture of country tiles or bricks for housing and for other activities. (b) The mining operations shall be carried out in accordance with the order of the Hon'ble Supreme Court dated 04.08.2006 in the matter of T.N. Godavarman Thirumulpad Vs. UOI in W.P.(C) No.202 of 1995 and dated 21.04.2014 in the matter of Goa Foundation Vs. UOI in W.P.(C) No.435 of 2012.
2.	Setting of industries causing pollution	No new industries and expansion of existing polluting industries in the Eco-

	(Water, Air, Soil, Noise, etc.).	sensitive zone shall be permitted. Only non-polluting industries shall be allowed within ESZ as per classification of Industries in the Guidelines issued by Central Pollution Control Board in February 2016, unless so specified in this notification. In addition, non-polluting cottage industries shall be promoted.
3.	Establishment of major hydroelectric project.	Prohibited (except as otherwise provided) as per applicable laws.
4.	Use or production or processing of any hazardous substances.	Prohibited (except as otherwise provided) as per applicable laws.
5.	Discharge of untreated effluents in natural water bodies or land area.	Prohibited (except as otherwise provided) as per applicable laws
6.	Establishment of Solid Waste disposal site and common incineration facility for solid and bio medical waste.	No Solid Waste disposal site and waste treatment/ processing facility of solid waste is permitted within eco sensitive zone. Further installation of common or individual incineration facility for treatment of any form of solid waste generated from industrial process and health establishment or hospital etc. is prohibited.
7.	Establishment of large-scale commercial livestock and poultry farms by firms, corporate, companies.	Prohibited.
8.	Setting of new saw mills.	No new or expansion of existing saw mills shall be permitted within the Eco-sensitive Zone.

9.	Setting up of brick kilns.	Prohibited (except as otherwise provided) as per applicable laws
	B. Regulated Activities	
10.	Commercial establishment of hotels and resorts.	No new commercial hotels and resorts shall be permitted within one kilometre of the boundary of the Protected Area or upto the extent of Eco-sensitive zone, whichever is nearer, except for small temporary structures for Eco-tourism activities. Provided that, beyond one kilometre from the boundary of the protected Area or upto the extent of Eco-sensitive zone whichever is nearer, all new tourist activities or expansion of existing activities shall be in conformity with the Tourism Master Plan and guidelines as applicable.
11.	Construction activities	(a) No new commercial construction of any kind shall be permitted within one Kilometre from the boundary of the Protected Area or upto extent of the Eco-Sensitive Zone whichever is nearer: (a) Provided that, local people shall be permitted to undertake construction in their land for their use including the activities listed in sub paragraph (1) of paragraph 6 as per building byelaws to meet the residential needs of the local residents such as: (i) Widening and strengthening of existing roads and construction of new roads; (ii) Construction and renovation of infrastructure and civic amenities; (iii) Small scale industries not

		causing pollution termed as per Classification done by Central Pollution Control Board of February 2016; (iv) Cottage industries including village industries; convenience stores and local amenities supporting eco-tourism including homestays; and (v) Promoted activities listed in this Notification. (b) Provided that the construction activity related to small scale industries not causing pollution shall be regulated and kept at the minimum, with the prior permission from the competent authority as per applicable rules and regulations, if any. (c) Beyond one kilometre it shall be regulated as per the Zonal Master Plan.
12.	Small scale non polluting industries.	Non polluting industries as per classification of industries issued by the Central Pollution Control Board in February 2016 and non-hazardous, small-scale and service industry, agriculture, floriculture, horticulture or agro-based industry producing products from indigenous materials from the Eco-sensitive Zone shall be permitted by the competent Authority.
13.	Felling of Trees	(a) There shall be no felling of trees on the forest or Government or revenue or private lands without prior permission of the competent authority in the State Government. (b) The felling of trees shall be regulated in accordance with the provisions of the

		concerned Central or State Act and the rules made thereunder.
14.	Collection of Forest produce or Non-Timber Forest Produce (NTFP).	Regulated under applicable laws.
15.	Erection of electrical and communication towers and laying of cables and other infrastructures	Regulated under applicable law. Underground cabling may be promoted.
16.	Infrastructure including civic amenities	Shall be done with mitigation measures, as per applicable laws, rules and regulation and available guidelines.
17.	Widening and strengthening of existing roads and construction of new roads.	Shall be done with mitigation measures, as per applicable laws, rules and regulation and available guidelines.
18.	Under taking other activities related to tourism like over flying the ESZ area by hot air balloon, helicopter, drones, Microlites, etc.	Regulated under applicable law
19.	Protection of Hill Slopes and river banks	Regulated under applicable laws
20.	Movement of vehicular traffic at night.	Regulated for commercial purpose under applicable laws.
21.	Ongoing agriculture and horticulture practices by local communities along with dairies, dairy farming, aquaculture and fisheries.	Permitted under applicable laws for use of locals.
22.	Discharge of treated waste water/effluents	The discharge of treated waste water/effluents shall be avoided to

	in natural water bodies or land area.	enter into the water bodies. Efforts to be made for recycle and reuse of treated waste water. Otherwise the discharge of treated waste water/effluent shall be regulated as per applicable laws.
23.	Commercial extraction of surface and ground water	Regulated under applicable law.
24.	Open Well, Bore Well etc. for agriculture or other usage	Regulated and the activity should be strictly monitored by the appropriate authority.
25.	Solid Waste Management.	Regulated under applicable laws
26.	Introduction of Exotic species.	Regulated under applicable laws.
27.	Eco-tourism	Regulated under applicable laws
28.	Use of polythene bags.	Use of polythene bags are permitted within the Eco Sensitive Zone. However, based on specific requirement, it shall be regulated under applicable laws.
29.	Commercial Sign boards and hoardings.	Regulated under applicable laws.
C. Promoted Activities		
30.	Rain water harvesting	Shall be actively promoted.
31.	Organic farming	Shall be actively promoted.
32.	Adoption of green technology for all activities	Shall be actively promoted.
33.	Cottage industries including village artisans, etc.	Shall be actively promoted.
34.	Use of renewable energy and fuels	Bio gas, solar light etc. to be actively promoted

35.	Agro-Forestry	Shall be actively promoted.
36.	Plantation of Horticulture and Herbals	Shall be actively promoted
37.	Use of eco-friendly transport	Shall be actively promoted.
38.	Skill Development	Shall be actively promoted.
39.	Restoration of Degraded Land/ Forests/ Habitat	Shall be actively promoted.
40.	Environmental Awareness	Shall be actively promoted.

3. Eco-Sensitive Zone Monitoring Committee

Monitoring Committee constituted for moitoring Eco-Sensitive Zone comprising of the following, namely: -

S.No.	Constituent of the Monitoring Committee	Designation
1	District Collector, Udaipur	Chairman
2	DLO of the Public works department, Udaipur	Member
3	DLO of the Irrigation Department, Udaipur	Member
4	DLO of the Mining Department, Udaipur	Member
5	DLO of the Police Department, Udaipur	Member
6	DLO of the Industry Department, Udaipur	Member
7	Regional officer of the state pollution control board Udaipur	Member
8	S.D.O., Kotra, Udaipur	Member
9	S.D.O., Jhadol, Udaipur	Member
10	One expert from the field of Ecology and Environment	Member
11	One expert NGO working in the field of Ecology and Environment	Member
12	Deputy Conservator of Forests, Udaipur	Member
13	Deputy Conservator of Forests, Udaipur (North)	Member
14	Deputy Conservator of Forests, Wildlife,	Member

	Udaipur	Secretary

4. Terms of Reference of the Monitoring Committee

S.No.	Terms of Reference
(1)	The Monitoring Committee shall monitor the compliance of the provisions of this notification.
(2)	The tenure of the Monitoring committee shall be for three years or till the re-constitution of the new Committee by the State Government and subsequently the Monitoring Committee would be constituted by the State Government.
(3)	The activities that are covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forests number S.O. 1533 (E), dated the 14th September, 2006, and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 7 thereof, shall be scrutinized by the Monitoring Committee based on the actual site-specific conditions and referred to the Central Government in the Ministry of Environment, Forest and Climate Change for prior environmental clearances under the provisions of the said notification.
(4)	The activities that are not covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment, Forest and Climate Change number S.O. 1533 (E), dated the 14th September, 2006 and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table

S.No.	Terms of Reference
	under paragraph 7 thereof, shall be scrutinized by the Monitoring Committee based on the actual site-specific conditions and referred to the concerned regulatory authorities.
(5)	The Member Secretary of the Monitoring Committee or District collector shall be competent to file complaints under section 19 of the Environment (Protection) Act, 1986 against any person who contravenes the provisions of this notification.
(6)	The Monitoring Committee may invite representatives or experts from concerned Departments, representatives from Industry Associations or concerned stakeholders to assist in its deliberations depending on the requirements on issue to issue basis.
(7)	The Monitoring Committee shall submit the annual action taken report of its activities as on 31st March of every year by 30th June of that year to the Chief Wildlife Warden in the state.
(8)	The Central Government in the Ministry of Environment, Forest and Climate Change may give such directions, as it deems fit, to the Monitoring Committee for effective discharge of its functions.
(9)	The Central Government and State Government may specify additional measures, if any, for giving effect to provisions of this notification.
(10)	The provisions of this notification shall be subject to the orders, if any, passed, or to be passed, by the Hon'ble Supreme Court of

S.No.	Terms of Reference
	India or the High Court or National Green Tribunal.

ANNEXURE – 1

PHULWARI WILDLIFE SANCTUARY RAJASTHAN

RANGE WISE & BLOCK WISE AREA STATEMENT

S.No.	Name of Range	Name of Block	Compartments	Area (Sq.Km.)
1	**Kotra**	**Dhedmariya**	**28**	**61.30**
		Devli	**19**	**53.40**
		Harwa	**10**	**20.46**
		Phulwari	**27**	**49.10**
			Total	184.26
2	**Panarwa**	**Dhrawan A & B**	**10**	**24.29**
		Daiya	**28**	**52.68**
		Ambasa	**33**	**60.58**
			Total	137.55
3	**Mamer**	**Umria**	**31**	**61.82**
		Mamer	**31**	**39.86**
		Ashawara	**25**	**40.58**
		Ada Haldu	**14**	**47.34**
			Total	189.60
			G. Total	511.41

ANNEXURE – 2

PHULWARI WILDLIFE SANCTUARY RAJASTHAN
AREA STATEMENT SHOWING CONSTITUTION AND EXTENT OF THE SANCTUARY BY COMPARTMENTS

S.No	Name of Division	Name of Range	Name of Block	Compar-tment No.	Area in Hectares *		
					R.F.	P.F.	U.C.
1	**Wildlife Division, Udaipur**	**Kotra**	**Dhedmariya**	**28**	**6130**	**-**	**-**
2			**Devli**	**19**	**-**	**5340**	**-**
3			**Harwa**	**10**	**-**	**2046**	**-**
4			**Phulwari**	**27**	**4910**	**-**	**-**
5		**Panarwa**	**DharawanA& B**	**10**	**-**	**2429**	**-**
6			**Daiya**	**28**	**5268**	**-**	**-**
7			**Ambasa**	**33**	**6058**	**-**	**-**
8		**Mamer**	**Umriya**	**31**	**6182**	**-**	**-**
9			**Mamer**	**31**	**3986**	**-**	**-**
10			**Asawara**	**25**	**4058**	**-**	**-**
11			**Ada haldu**	**14**	**-**	**4734**	**-**
			Total		36592	14549	

* P.F. = Protected Forest, R.F.=ReserveForest, U.C.= Unclassed Forest

ANNEXURE – 3

PHULWARI WILDLIFE SANCTUARY RAJASTHAN

AREA STATEMENT SHOWING CONSTITUTION AND EXTENT OF THE SANCTUARY BY DISTRICTS & LEGAL STATUS

(I) DISTRICT WISE AREA

S.No.	Name of District	Area of Sanctuary within limits of District Boundaries (Hectares)	Details of Area (Hectares)		
			R.F.	P.F.	U.C.
1	**2**	**3**	**4**	**5**	**6**
1.	**Udaipur**	**51141**	**36592**	**14549**	**-**
	Total	51141	36592	14549	-

(II) LEGAL STATUS WISE AREA -

S.No.	Total Area of Sanctuary	Details of Area		
		R.F.	P.F.	U.C.
1	**2**	**3**	**4**	**5**
1.	**51141**	**36592**	**14549**	**-**

Annexure 4
Notification of Phulwari Ki Nal Wildlife Sanctuary

राजस्थान सरकार
राजस्व (वन-8) विभाग

क्रमांक/एफ0 1(1)राज/8/83 दिनांक- 6.10.83

अधिसूचना

यत: राज्य सरकार को यह प्रतीत होता है कि इससे संलग्न उपबन्ध में परिनिश्चित क्षेत्र को उसमें पाये जाने वाले वन्य जीवों के संरक्षण, प्रवारण एवं उनके विकास एवं पर्यावरण के प्रयोजनार्थ उसके परिस्थितिक प्राणी जातीय वनस्पति, भू-संरचना तथा प्राणी विज्ञान सम्बन्धी सहयोजना और महत्व के कारण वन्य जीव अभयारण्य के रूप में गठित करने की आवश्यकता है।

अत: वन्य जीव (संरक्षण) अधिनियम 1972 (1972 के केन्द्रीय अधिनियम सं. 53) की धारा 18(1) के अधीन प्रदत्त शक्तियों के प्रयोग में राज्य सरकार उक्त क्षेत्र से एक अभयारण्य जिसे "वन्य जीव अभयारण्य फुलवाड़ी" के नाम से उद्घोषित किया जायेगा के रूप में गठित करने का अपने आशय का इसके द्वारा घोषणा करती है।

अनुसूचि

क्र.सं.	क्षेत्र	नाम तहसील	जिला	सीमाएं	कि0मि0
1.	व0 जी0 कोटड़ा एवं अभयारण्य फुलवाड़ी	उदयपुर		उत्तर-	वन खण्ड ठेटमा, रिखा की उत्तरी वनखण्ड रामकुण्डा की पश्चिमी एवं वनखण्ड हरवा की उत्तरी सीमा से रेखाएं
				पूर्व-	वन खण्ड हरवा, देवली, धाराकण एवं ठेबन की पूर्वी सीमा रेखाएं।
				दक्षिण-	वनखण्ड ठेखा, बम्बाडा, बाबाबड़ा एवं नाहेर की दक्षिण सीमा रेखाएं।
				पश्चिमी-	वनखण्ड नाहेर, उपरिया फुलवाड़ी देवली एवं ठेटमारिया की पश्चिमी रेखाएं।

राज्यपाल की आज्ञा से
ह0
(आनन्द मोहन लाल)
राजस्व सचिव

ANNEXURE – 5

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

ZONEWISE AREA STATEMENT

S. No.	Name of Block	Compartment number included in Core Zone	Compartment number included in Buffer Zone
1	Dhedmariya	15 Partly,16P ,17P,18P,19P,21to 28	1to 14, 15P,16P,17P,18P,19P,20P
2	Harwa	1P,2P,3P,4P,5,6,7P,8P,9P,10P,	1P,2P,3P,4P, 7P,8P,9P,10P
3	Devoli	2P,3,7P,8,9P,10P,11P,12,13P,14 ,15,16, 17,18,19	1,2P,4,5,6,7P,9P,10P,11P, 13P
4	Phulwari-ki-nal	12P,13P,18,19P,20P,21P,22,23, 24P,25P,26P,27	1to11, 12P,13P,14P,15,16,17,19 P,20P,21P,24P,25P,26P
5	Umaria	-	1to31
6	Dharawan	-	1to10
7	Daiya	-	1to28
8	Ambasa	6,7,8P,9,10P,11P,12P,13P,14P,1 7,18,21P,22P,23,24,25,28,29,30	1to 5, 8P,10P,11P,12P,13P,14P, 15,16,19,20,21P,22P,26,2 7,31,32,33
9	Adahaldu	1to5,7P,10P,12P	6,7P,8,9,10P,11,12P,13,1 4
10	Asawara	1P,2,3,6,7P,8,9P,10P,11,12,13, 14,15,16P,17P,18P,19,20P,21P, 22P	4,5,7P,9P,10P,16P17P,18 P,20P,21P,22P,23,24,25
11	Mamer	1P,2P,3P,4,5,8,9,10,11P,12P,13, 14P,15,20P	1P,2P,3P,6,7,11P,12 P,14P, 16,17,18,19,20P, 21to 31

ANNEXURE – 6

PHULWARI WILDLIFE SANCTUARY RAJASTHAN

CENSUS FIGURES OF WILD ANIMALS

(HERBIVOROUS)

FROM 2014 TO 2024

S.No	Name of species	Technique of counting*	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
1.	Four - horned Antelope	T,D,W	26	24	15	24	22	20	28	-	30	-	29	31
2.	Porcupine	T,D,W	59	65	71	74	51	57	77	-	86	-	100	129
3.	Sloth Bear	T,D,W,P	28	28	26	24	32	43	34	-	38	-	43	48
4.	Flying Squirrel	D	86	91	88	85	42	56	78	-	79	-	98	139
5.	Wild Boar	T,D.W	12	11	04	27	11	14	22	-	26	-	44	79

* Trekking (T), direct viewing (D), Waterhole census (W), and Pug-mark method (P)

ANNEXURE – 7

PHULWARI WILDLIFE SANCTUARY RAJASTHAN
CENSUS FIGURES OF WILD ANIMALS
(CARNIVORES)
FROM 2014 TO 2024

S.No	Name of species	Technique of counting*	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
1	Panther	T,D,W,P	19	18	17	19	21	21	24	-	27	-	24
2	Jungle Cat	T,D,W	17	69	71	69	77	78	83	-	91	-	97
3	Jackal	T,D,W	136	133	113	128	136	144	160	-	167	-	190
4	Fox	T,D,W	66	64	63	62	78	74	95	-	91	-	113
5	Common Mongoose	T,D,W	164	127	130	120	125	128	110	-	90	-	-
6	Ruddy Mongoose	T,D,W	87	56	68	50	54	48	40	-	76	-	-
7	Hyena	T,D,W	47	46	40	48	53	53	49	-	50	-	60
8	Civet (Toddy Cat)	T,D,W	71	46	58	49	64	74	81	-	64	-	70
9	Civet (Common)	T,D,W	13	17	4	12	27	24	29	-	29	-	51
10	Pangolin	T,D,W	4	4	-	-	-	-	-	-	-	-	-
11	Monitor Lizard	T,D,W	42	-	4	3	-	23	23	-	-	-	-
12	Crocodile	T,D,W	2	3	2	2	2	2	4	-	3	-	5

* Trekking (T), Direct viewing (D), Waterhole census (W), and Pug-mark method (P)

ANNEXURE - 8

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF MAMMALS WITH LOCAL STATUS

S.No.	Local Name	English Name	Scientific name	Local Status*
1.	Bhund	Wild Boar	*Sus scrofa*	R
2.	Chhachhunder	GreyMusk Shrew	*Sunchus murinus*	C
3.	Samisulia	Bat	*Cyanopterus sphynx*	L
4.	Bagal	Flying Fox	*Pteropus gigenticus*	A
5.	Cheetra	Panther	*Panthera pardus*	L
6.	Boot	Ratel	*Malivora capensis*	R
7.	Vandra	Common Langur	*Presbytis entellus*	C
8.	Jharakh	Striped Hyena	*Hyaena hyaena*	L
9.	Jungli minki	Jungle Cat	*Felis chaus*	L
10.	Khiskoli	Palm Squirrel	*Funambulus pennanti*	A
11.	Halahooda	India Pangolin	*Manis carassicaudata*	L
12.	Lonkdi	Indian Fox	*Vulpes bengalensis*	L
13.	Noliyo	Common Mongoose	*Herpestes edwardsi*	C
14.	Bhundra	Ruddy Mongoose	*H. smithi*	L
15.	Oonder	House Rat	*Rattus rattus*	A
16.	Rinchh	Sloth Bear	*Melursus ursinus*	L
17.	Roj, Nilgai	Blue Bull	*Boselaphus tragocamelus*	R
18.	Hunhan	Indian Hare	*Lepus nigricollis*	C
19.	Heli	Indian Porcupine	*Hystrix indica*	L
20.	Gaganghotiya	Pale Hedgehog	*Paraechinus micropus*	L
21.	Shiyal	Jackal	*Canis aureus*	A
22.	Viju	Indian Small Civet	*Vivaricula indica*	L
23.	Viju	Toddy Cat	*Paradoxurus hermaphroditus*	L
24.	Siagosh	Caracal	*Felis caracal*	R
25.	Bhedal	Four-horned Antelope	*Tetracerus quadricornis*	R

* A = Abundent, C = Common, L = Less common, R = Rare

ANNEXURE - 9

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF BIRDS WITH LOCAL STATUS

Group	English name	Latin Name	Local name	Local Status *
Partriges & Francolins	1. Painted Francolin	*Francolinus pictus*	Kalda	L
	2. GreyFrancolin	*F. pondicerianus*	teetar	R
Quils & Button quails	2.Common Quail	*Coturnix coturnix*	Lava	C
	4. Rain Quail	*C. coromadelica*	Lava	C
	5. Rock Bush Quail	*Perdicula argoundah*	Lava	C
	6. Yellow-legged button Quail	*Turnix tanki*	Lava	C
	7. Barred Button Quail	*T. suscitator*	Lava	L
Spurfowls	1. Red Spurfowl	*Galloperdix spadicea*	Jhapta	R
Pheasants	2. GreyJunglefowl	*Gallus sonneratii*	UjadiKukd	R
	3. Indian Peafowl	*Pavo cristatus*	Mor	R
Geese, Whistling ducks shelduck, ducks	4. Ruddy Shelduck	*Tadorana ferruginea*	-	R
	5. Gadwal	*Anas strepera*	-	R
	6. Eurasian Wigeon	*A.. penelope*	-	R
	7. Spot-billed Duck	*A. poecilorhyncha*	-	R
	8. Common Teal	*A. crecca*	-	R
	9. Garganey	*A. querquedula*	-	R
	10. Northern Pintail	*A. acuta*	-	R
	11. Northern Shoveller	*A. clypeata*	-	R
	12. Common Pochard	*Aythya ferina*	-	L
Woodpeckers	13. Yellow-Crowned Woodpecker	*Dendrocopos mahrattensis*	Sutharna	L
	14. Black Rumped Flameback	*Dinopium benghalensis*	Sutharna	C
Barbets	15. Brown-headed Barbet	*Megalaima zeylanica*	Tatrok	L
	16. Coppersmith Barbet	*M. heancephala*	Chhoti tatrok	C
Hornbill	17. IndinGrey Hornbill	*Ocyceros birostris*	Dhantar	R
Hoopae	18. Commor Hoopoe	*Upupa epops*	Sutharia	L
Rollers	19. European Roller	*Coracias garrulus*	-	R
	20. Indian Roller	*C. benghalensis*	Nillkanth	L
Kinghfisher	21. Common Kingfisher	*Alcedo athis*	-	L
	22. White-throated kingfisher	*Halcyon smyrnesis*	-	C
	23. Pied Kingfisher	*Ceryle rudis*	-	L
Bee-eater	24. Green Bee-eater	*Merops orientalis*	-	C
Cerckoos	25. Pied cuckoo	*Clamator jacobinus*	-	C
	26. Common Hawk Cuckoo	*Hierococcyx various*	-	L
	27. Eurarian Cuckoo	*Cuculus canorus*	-	L
	28. Asian Koel	*Eudynamys scolopacea*	Koel	C
	29. SirkeerMalkoha	*Phoenicophaeus leschnaultii*	-	R
	30. Greater Coucal	*Centropus sinensis*	-	C

Parakeets	31. Alexandrine Parakeet 32. Rose-ringed Parakeet 33. Plum headed Parakeet	*Psittacula eupatria* *P. krameri* *P. cynoceplala*	Gagli Hooda Tui	R C C
Swift	34. House swift	*Apus affinis*	Kanuda	R
Owl	35. Barn Owl 36. Collared Scops Owl 37. Eurasian Eagle Owl 38. Jungle Owlet 39. Spotted owlet	*Tytoalba* *Otus bakkamoena* *Bubo bubo* *Glaucidium radiatum* *Athene brama*	- - Ghughu - Chhibra	R R R C C
Nightjar	40. Indian Nightjar 41. Savanna Nightjar	*Caprimulgus asiaticus* *C. affinis*	Pataped Pataped	C R
Pigeon	42. Rock Pigeon 43. Yellow-footed Green Pigeon	*Columba livia* *Treron phoenicoptera*	Pareva Halewar	C L
Doves	44. Laughing Dove 45. Spotted Dove 46. Europian Collared Dove	*Streptopelia senegalensis* *S. chinensis* *S. decaocto*	Holy Holy Holy	A A R
Rallids	47. Common Moorhen 48. Common Coot	*Gallinula chloropus* *Fulica atra*	- -	R C
Waders	49. Common Redshnk 50. Green Sandpiper 51. Wood Sandpiper 52. Common Sandpiper	*Tringa totanus* *T. ochropus* *T. glareola* *Actitis hypoleucos*	- - - -	L L L C
Thick Knees	53. Europian Thick-knee 54. Great Thick-knee	*Burhinus oedicnemus* *Esacus recurvirostris*	- -	L L
Plovers & Lapwings	55. Little Ringed Plover 56. Red wattled Lapwing	*Charadrius dubius* *Vanellus indicus*	- Teetodi	L A
Terus	57. River Tern	*Sterna aurantia*	-	L
Kites	58. Black Shouldered Kite 59. Black Kite	*Elanus caeruleus* *Milvus migrans*	- -	C C
Vultures	60. Egyptian Vulture 61. White-rumped Vulture 62. Long-billed Vulture	*Neophron percnopterus* *Gyps bengalensis* *G. indicus*	Hamli Girajh -	C R R
Eagles & Hawk Eagles	63. Crested Serpent Eagle 64. Changeable Hawk Eagle	*Spilornis cheela* *Spizaetus cirrhatus*	- -	R R
Accipiters	65. Shikra	*Accipiter badius*	-	C
Bazzards	66. White-eyed Buzard	*Butostur teesa*	-	C
Falcon	67. Red-necked Folcon	*Falco chicquera*	-	R
Grebe	68. Little Greb	*Tachybaptus ruficollis*	-	C
Darter & Cormorants	69. Darter 70. Little cormorant 71. Great Cormorant	*Anhinga melanogaster* *Phalacrocarax niger* *P. carbo*	- - -	L C L
Egret & Herons	72. Little Egret 73. Intermediate Egret 74. Cattle Egret 75. Indian Pond Heron 76. GreyHeron	*Egretta garzetta* *Mesophoyx intermedia* *Bubulcus ibis* *Ardeola grayii* *Ardea cinerea*	Bagula Bagula Bagula Bagula Bagula	A L A A L
Ibises	77. Black-headed Ibis 78. Black Ibis	*Threskiornis melounocephala* *Pseudibis papillosa*	- -	L L

Storks	79. Painted Stork 80. Asian Openbill Stork 81. Woolly-necked Stork	*Mycteria leucocephala* *Anastomus oscitans* *Ciconia epicopus*	- - -	L C L
Pitta	82. Indian Pitta	*Pitta brachyura*	-	C
Shrike	83. Longteiled Shrike 84. Great GreyShrike	*Lanius schach* *L. excubitor*	Son-chiri -	A R
Treepie & Crows	85. Rufous Treepie 86. House Crow 87. Large-billed Crow	*Dendrocitta vagabunda* *Corvus splendens* *C. mncrorhynchos*	Ganela Kowa Dhod	A A A
Oriole	88. Eurasian Golden oriole	*Oriolus oriolus*	Peelak	A
Minivet	89. Small Minivet	*Pericrocotus cinnamomeus*	-	C
Fantails	90. White-throated Fantail 91. White-browed fantail	*Rhipidura albicollis* *R. aureola*	Nachan -	L L
Drongos	92. Black-Drongo 93. White-bellied Drongo	*Dicrurus macrocercus* *D. caerulescens*	Kangwalia -	C L`
Paradise Flycatchers / Flycatchers	94. Asian Paradise – Flycatcher 95. Red-throated Flycatcher 96. Grey-headed Canary Flycather	*Terpsiphone paradisi* *Ficedula parva* *Culicicapa ceylonensis*	Mehpedka - -	L C C
Ioras	97. Common Iora	*Aegithina tiphia*	-	C
Chat bush chuts, Robi etc.	98. Oriental Magpie Robin 99. Indian Robin 100. Black Redstart 101. Common Stonechat 102. Pied Bashchat 103. Variable wheater	*Copsychus saularis* *Saxicoloides fulicata* *Phoenicurus ochruros* *Saxicola torquata* *S. capreata* *Oenanthe picata*	- Duchki - - - -	C C C C C R
Starling and Mynas	104. Brahminy starling 105. Common Myna	*Sturnus pagodarum* *Acridotheres tristis*	Cabar Cabar	C A
Tit	106. Great Tit 107. Black-lored Tit	*Parus major* *P. xanthogenys*	- -	L R
Martin & Swallows	108. Dusky Crag Martin 109. Wire-tailed swallow 110. Red-rumped swallow	*Hirumdo cancolor* *H.Smithii* *H.Daurica*	- - -	C C C
Bulbul	111. Red vented Bulbul	*Pyconotus cafer*	Pittola	A
Warblers	112. GreyBreasted Prinia 113. Ashy Prinia 114. Lesser Whitethroat 115. Common Tailarbird	*Prinia hodgsonii* *P. socialis* *Sylvia curruca* *Orthotomus sutorius*	- - - -	A A A A
White eye	116. Oriental white eye	*Zosterops palpebrosus*	-	A
Babbler	117. Common Babbler 118. Large GreyBabbler 119. Jungle Bobbler	*Turdoides caudatus* *T. malcolmi* *T.Striatus*	- - -	R R A
Larks	120. Indian BushLark 121. Ashy Crowned Sparrow Lark	*Mirofra eyethroptera* *Eremopterix nigriceps*	- -	L C

Sunbird	122. Purple Sunbird	*Nectarinia asiatica*	Sui	C
Sparrow weavers and mumias	123. House Sparrow 124. Chestnut-shouldered Petronia 125. BayaWeaver 126. Scaly-breasted Munia 127. Indian Silverbill	*Passer domestica* *Petronia xanthocollis* *Ploceus phillpinus* *Lonchura punctulata* *L. malabarica*	Chakli - Jhari - -	A A A C C
Wagtail	128. White Wagtail 129. White browed Wagtail 130. Yellow Wagtail 131. Citrine Wagtail	*Motacillaalba* *M. maderaspatensis* *M. flava* *M. citreola*	- - - -	C L L L
Pipit	132. Paddyfield Pipit	*Anthus phulvus*	-	A
Buntings	133. Crested Bunting	*Melophus lathami*	-	C

* A = Abundent, C= Common, L = Less common, R= Rare

ANNEXURE - 10

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF AMPHIBIONS WITH LOCAL STATUS

S. No.	Local Name	English Name	Scientific Name	Local Status*
1	Dedka	Indian Bull Frog	*Rana tigerina*	C
2	Dedka	Indian Burrowing Frog	*R. tomopterna*	A
3	Dedka	Skipper Frog	*R. cynophlyctus*	A
4	Dedka	Cricket Frog	*R. limnocharis*	A
5	Dedka	Indian Baloon Frog	*Uperodon systema*	L
6	Dedka	Common Toad	*Bufo melanoctictus*	A
7	Dedka	Marbled Toad	*B. andersoni*	L

***** A = Abundent, C= Common, L = Less common, R= Rare

ANNEXURE - 11

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF REPTILES WITH LOCAL STATUS

S. No.	Local Name	English Name	Scientific Name	Local Status*
1	Ajgar	Indian python	*Python molursus*	R
2	Andhdi chakdol, Boga	JohnSandboa	*Eryx johni*	L
3	Bodi bamani	Common Skink	*Mabuya carinata*	C
4	Dedu	CheakeredKeelback	*Natrix piscator*	C
5	Dhaman	Rat snake	*Ptyas mucosus*	C
6	Garodi	House lizard	*Hemidactylus flaviviridis*	A
7	Garodi	Termite Gecko	*H. tridrus*	R
8	Kachhua	Starred tortoise	*Geochelone elegans*	R
9	Kachinda, Kangatia	Garden Lizard	*Calotes versicolor*	A
10	Kalotra	Common Indian Krait	*Bungarus caeruleus*	R
11	Khadchitti	Russel's Viper	*Vipera russelli*	R
12	Leelo kachindo, Halanviya	Indian Chamaeleon	*Chamaeleon zeylanicus*	R
13	Magar	The Indian Crocodile	*Crocodylus palustris*	R
14	Nag, Nagin	Indian cobra	*Naja naja*	R
15	Kachhua	Flapshell turtle	*Lissemys punctata*	R
16	Pankha	Fan-throated lizard	*Sitana ponticeriana*	C
17	Patla goh	Moniter lizard	*Varanus bengalensis*	C
18	Udni	Tree snake	*Dendrolephis tristis*	R
19	-	Green Whip Snake	*Ahetulla nesutus*	R
20	-	Brown Whip Snake	*Ahetulla pulverulenta*	R

***** A = Abundent, C= Common, L = Less common, R= Rare

ANNEXURE - 12

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF FISHES WITH LOCAL STATUS

S. No.	Local Name	English Name	Scientific Name	Local Status*
1.	Katla	Katla	*Catla catla*	A
2.	Rohu	Rohu	*Labeo rohita*	A
3.	Grigal	Grigal	*Cirrhina mrigal*	C
4.	Mahasir	Mahasir	*Tor tor*	C
5.	Putthi	Putthi	*Puntius sarana*	L
6.	Sarsi	Sarsi	*Labeo granius*	L
7.	Lanchi	Lanchi	*Wallago attu*	C
8.	Singhara	Singhara	*Mystus seenghati*	C
9.	Kater	Kater	*Mystus cavassius*	R
10.	Sanwal	Sanwal	*Channa manilius*	C
11.	Singhi	Singhi	*Heteropuntustis fossilis*	R
12.	Bam	Bam	*M. armatus*	R
13.	Suiya	Suiya	*Bellana cancilla*	R
14.	Baata	Baata	*Labeo baata*	R
15.	Dudhia	Dudhia	*Labeo bugget*	R
16.	Chaal	Chaal	*Rasbora damicassicus*	R
17.	Kalot	Kalot	*Labeo calbasu*	R

* A = Abundent, C= Common, L = Less common, R= Rare

ANNEXURE - 13

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF IMPORTANT INVERTEBRATES WITH LOCAL STATUS

S. No.	Hindi Name	English Name	Scientific Name	Local Status*
1	MadhuMakkhi	Rock Bee	*Apis dorsata*	L
2	MadhuMakkhi	Indian Bee	*Apis indica*	L
3	Tanni	Cicada	*Cicada sp.*	A
4	Kenchua	Earth Worm	*Pheritema posthumas*	C
5	-	Earth Worm	*Neocerambyxparis*	R
6	-	Praying Mantias	*Mantis sp.*	C
7	Gobar ka Gubrella	Dung Beetle	*Onthophagus sagittarius*	C
8	-	Blister Beetle	*Mylobris pustulata*	A
9	Bichchhu	Common Scorpion	*Buthus sp.*	A
10	Kankhajura	Centipede	*Scolopendra sp.*	A
11	BadaGharmela	Milipede	*Julus sp.*	C
12	Titli	Lime Butterfly	*Papilio demoleus*	A
13	Titli	Great Marmon	*P. memnon*	C
14	Titli	Blue Pansy	*Junonia crithya*	A
15	Titli	Pecock Pansy	*J. almana*	C
16	Titli	Striped Tiger	*Danaus genutta*	A
17	Titli	Plain Tiger	*D. chrysippus*	A
18	Titli	Painted Lady	*Vanessa carduri*	A
19	Titli	Common Grass Yellow	*Eurema hecabe*	A

* A = Abundent, C= Common, L = Less common, R= Rare

ANNEXURE - 14

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

A LIST OF TREES, SHRUBS, HERBS, CLIMBERS, GRASSES AND BAMBOOS IN THE SANCTUARY WITH LOCAL STATUS

TREES

(Status Index:A= Abundent, C=Common, L=Less common, R= Rare, I= introduced)

S. No.	Botanical Name	Common Name	Family	Local Status
1.	*Acacia catechu*	Khair	Mimosaceae	A
2.	*Acaia leucophloea*	Ronjh	Mimosaceae	A
3.	*Acacia nilotica*	DesiBawalia	Mimosaceae	L
4.	*Acaciasenegal*	Kumta	Mimosaceae	R
5.	*Adina cordifolia*	Haldu	Rubiaceae	L
6.	*Aegle marmelos*	Bili	Rutaceae	L
7.	*Ailanthus excelsa*	Ardusa, paba	Simaroubaceae	L
8.	*Alangium salvifolium*	Ankol	Alangiaceae	A
9.	*Albizzia lebbeck*	Black siris	Mimosaceae	L
10-.	*Albizzia odoratissima*	Safed siris	Mimosaceae	L
11.	*Albizzia procera*	Safed siris	Mimosaceae	R
12.	*Annona sequamosa*	Sitaphal	Annonaceae	C
13.	*Anogeissus latifolia*	Dhavda	Combretaceae	C
14.	*Anogeissus sericea*	Adrukh, Indok	Combretaceae	R
15.	*Azadirachta indica*	Neem	Meliaceae	L
16.	*Balanites aegyptica*	Hingot	Balanitaceae	C
17.	*Bauhenia purpurea variegata*	Kachnar	Caesalpiniaceae	R
18.	*Bauhenia recemosa*	Jhinjha, Heetri	Caesalpiniaceae	L
19.	*Bombax ceiba*	Semal	Bombacaceae	L
20.	*Boswellia serrata*	Salar	Burseraceae	L
21.	*Bridelia retusa*	Asan, Lampan	Euphorbiaceae	R
22.	*Butea monosperma*	Khakhro	Papilionaceae	A

23.	*Casearia elliptica*	Mojal	Lecythidaceae	R
24.	*Cassia fistula*	Karmela	Caesalpiniaceae	L
25.	*Cassia siamea*	Kasid	Caesalpiniaceae	I
26.	*Cordia mixa*	Gunda, Lisoda	Ehretiaceae	L
27	*Crataeva religiosa*	Varna	Capparaceae	R
28	*Dalbergia latifolia*	Sisam	Papilionaceae	R
29	*Dalbergia paniculata*	Dhoban	Papilionanceae	R
30	*Dalbergia sissoo*	Sissoo	Papilionaceae	I
31	*Delonix elata*	Sandeshro	Caesalpiniaceae	C
32	*Diospyros melanoxylon*	Timru	Ebenaceae	C
33	*Ehretia laevis*	Tambolia	Ehretiaceae	L
34	*Emblica officinalis*	Amla	Euphorbiaceae	L
35	*Erythrina suberosa*	Dhed khakhro	Papilionaceae	R
36	*Euclyptus sp.*	Nilgiri	Myrtaceae	I
37	*Ficus benghalensis*	Vad	Moraceae	C
38	*Fucus hispida*	Kamri	Moraceae	R
39	*Ficus racemosa*	Umara	Moraceae	C
40	*Ficus religiosa*	Piplo	Moraceae	C
41	*Firmiana colorata*	Kodan, Kodala	Sterculiaceae	R
42	*Flacourtia montana*	Kankan	Flacourtiaceae	C
43	*Gardenia resinifera*	Dikamari	Rubiaceae	R
44	*Gmelina arborae*	Sewan	Verbenaceae	R
45	*Grewia hirsuta*	KhadDhaman	Tiliaceae	L
46	*Grewia tenax*	Gangeti	Tiliaceae	L
47	*Grewia tiliaefolia*	Dhaman	Tiliaceae	L
48	*Holoptelia integrifolia*	Kanji	Ulmaceae	L
49	*Hymenodictyon excelsum*	Lunio	Rubiaceae	R
50	*Kydia calycina*	Moti hirvani	Malvaceae	R
51	*Lannea coromandelica*	Godla	Anacardiaceae	A
52	*Leucaena leucocephala*	Subabul	Mimosaceae	I

53	*Limonia acidissima*	Kotbadi	Rutaceae	R
54	*Madhuca indica*	Mahudo	Sapotaceae	A
55	*Mallotus phillppensis*	Kanku, Rohan	Euphorbiaceae	R
56	*Mangifera indica*	Amba	Ancardiaceae	C
57	*Melia azaderach*	Bakain limdo	Meliaceae	L
58	*Miliusa tomentosa*	Umb	Annonaceae	L
59	*Mitragyna parviflora*	Kalam	Rubiaceae	C
60	*Moringa oleifera*	Sahjana	Moringaceae	L
61	*Oroxylum indicum*	Tentu, Pharry	Bignoniacul	R
62	*Phoenix sylvestris*	Khajur	Palmae	A
63	*Pithecellobium dulce*	Kikar	Mimosaceae	L
64	*Pongamia pinnata*	Karanj	Papilionaceae	A
65	*Prosopis cineraria*	Khijdo,	Mimosaceae	R
66	*Prosops juliflora*	Vilayati	Mimosaceae	I
67	*Pterocarpus marsupium*	Bia	Papilionance	R
68	*Sapindus emarginatus*	Aritha	Sapindaceae	R
69	*Schrebera swietenoides*	Mokho	Oleaceae	R
70	*Soymida fabrifuga*	Royan	Meliaceae	R
71	*Sterculia urens*	Kadayo	Sterculiaceae	L
72	*Syzygium cumuni*	Jambu	Myrtaceae	R
73	*Syzygium heynianum*	MakkaniyaJambu	Myrtaceae	A
74	*Tamarindus indica*	KhatriAmli	Caesalpiniaceae	L
75	*Tecomella undulata*	Rohida	Bignoniaceae	R
76	*Tectona grandis*	Sag, Sagwan	Verbenaceae	L
77	*Terminalia arjuna*	Kohda	Combreataceae	L
78	*Terminalia bellarica*	Baheda	Combretaceae	A
79	*Wrightia tinctoria*	Dudhi	Apocyanaceae	A

80	*Wrightia tomentosa*	Dudhi	Apocyanaceae	L
81	*Zizyphus mauritiana*	Bordi	Rhamnaceae	A
82	*Zizphus xylophora*	Ghat bor	Rhamnaceae	L

SHRUBS

S. No.	Botanical Name	Common Name	Family	Local Status
1.	*Adhatoda vesica*	Ardusa	Acanthaceae	C
2.	*Agave americana*	Rambans	Agavaceae	R
3.	*Calotropis gigantea*	Akdo	Asclepiadaceae	A
4.	*Calotropis procera*	Akdo	Asclepiadaceae	L
5.	*Capparis decidua*	Ker	Capparaceae	R
6.	*Capparis grandis*	PadanBor	Capparaceae	R
7.	*Capparis sepieria*	Kanther	Capparaceae	A
8.	*Corissa conjesta*	Karamada	Apocynaceae	L
9.	*Cassia auriculata*	Awal	Caesalpiniaceae	A
10.	*Cassia occidentalis*		Caeslpiniaceae	L
11.	*Clerodendron phlomidis*	Arani	Verbenaceae	L
12.	*Dendrocolamus strictus*	Bans	Poaceal	C
13	*Dendropthoe fulcuta*	Vahi-hankal	Lorarthaceae	C
14.	*Dichrostachys cinerea*	Goya khair	Mimosaceae	C
15.	*Euphorbia nerifolia*	Thor	Euphorbiaceae	C
16.	*Euphorbia nivulia*	Thor	Euphorbiaceae	C
17.	*Helicteres isora*	Marod phali	Sterculiaceae	A
18.	*Holarrhena antidysenterica*	Kadwa	Apocyanaceae	A
19.	*Hibiscus lobatus*	---	Malvaceae	L
20.	*Jatropha carcus*	Ratna jyot	Euphorbiaceae	A
21.	*Jatropha gossypifolia*	ChhotiRatanJyot	Euphorbiaceae	A

22.	*Kirganelia reticulata*	Kamboi	Euphorbiaceae	A
23.	*Leptadenia pyrotechnica*	Khinp	Asclepiaduceae	A
24.	*Mimosa hamata*	Aila	Mimosaceae	R
25.	*Nyctenthes arbor-tristis*	Tamat	Nyctoginaceae	A
26.	*Plumbego zeylanica*	Chitrak	Plunbeginaceae	LL
27.	*Ricinus communis*	Arundo	Euphorbiaceae	R
28.	*Securinega leucopyrus*	Shenvi	Euphorbiaceae	L
29.	*Securinega virosa*	--	Euphorbiaceae	L
30.	*Thespesia lampas*	Paras pipal	Malvaceae	R
31.	*Viscum articulatum*	Vando	Loranthaceae	L
32.	*Vitex nigundo*	Nagod	Verbenaceae	A
33.	*Vogelia indica*	Chitawal	Plembegenaceae	A
34.	*Waltheria indica*	--	Sterculiaceae	L
35.	*Woodfordia fruticosa*	Dhavadi	Lythraceae	L
36.	*Zizyphus glabarata*	Bordi	Rhamnaceae	L
37.	*Zizyphus nummularia*	Chanibor	Rhamnaceae	L

CLIMBERS

S. No.	Botanical Name	Common Name	Family	Local Status
1.	*Abrus precatorius*	Ratti	Papilionaceae	C
2.	*Ampelocissus latifolia*	Khata limbu	Vitaceae	C
3.	*Argyreia sericea*	Samudrasok	Convolvulaceae	I
4.	*Asparagus racemosus*	Satvari	Liliaceae	L
5.	*Butea superba*	Khakhra-vel	Papilionaceae	R
6.	*Canavalla gladiata*	Alad	Papilionaceae	L
7.	*Cardiospermum halicacabum*	Kak mardika	Sapindaceae	A
8.	*Cayratia camosa*		Vitaceae	C
9.	*Celastrus paniculata*	Mali	Celastraceae	L

10	*Cissampelos pareira*	Pahod Bel	Menispermaceae	C
11.	*Cissus repanda*	Panibel	Vitaceae	C
12.	*Clitoria ternatea*	--	Papilionaceae	R
13.	*Coccinia india*	Tindori	Cucurbitaceae	C
14.	*Cocculus hirsutus*	Vevdi	Menispermaceae	C
15.	*Cosmostigma racemosum*	--	Asclepiadaceae	R
16.	*Cryptolepis buchanani*	--	Periplocaceae	C
17.	*Cucumis callosus*		Cucurbitaceae	C
18.	*Cuscuta reflexa*	Amarvel	Convolvulaceae	C
19.	*Dioscorea bulbifera*	Varahi kand	Dioscoriaceae	C
20.	*Dioscorea hispida*	Bhoi kand	Dioscoriaceae	C
21.	*Dioscorea pentaphylla*	Kudvel	Dioscoriaceae	C
22	*Hemdesmus indicus*	Dudhvel	Asclepiadaceae	C
23	*Hiptage bengalensis*	Ameti	Malpighiaceae	R
24	*Ipomoea nil*	Kaladana	Convolvulaceae	C
25	*Ipomoea pestigridis*	--	Convolvalaceae	C
26	*Ipomoea sindica*	--	Convolvulaceae	L
27	*Impomoes sinensis*	--	Convolvulaceae	
28	*Leptadenia reticulata*	Nani dodi	Asclepiadaceae	R
29	*Luffa acutangula*	Turia	Cucurbitaceae	C
30	*Luffa echinata*	Kakadvel	Cucurbitaceae	C
31	*Maerua arneria*	Hemkand	Capparidacea	R
32	*Merremia aegyptica*		Convolvulaceae	C
33	*Marremia emarginata*		Convolvulaceae	C
34	*Merremia hederacea*	---	Convolvulaceae	C
35	*Momordica balasama*	---	Cacurbitaceae	R
36	*Momordica dioca*	Kikoda	Cacurbitaceae	A
37	*Mucuna pruriens*	Kavach	Papilionaceae	C

38	*Oxystelma esculentum*	--	Asclepiadaceae	R
39	*Pergularia daemia*		Asclepiadaceae	C
40	*Peuraria taberosa*	Gejvi	Papilionaceae	C
41	*Passiflora edulis*		Passiflorace	L
42	*Rhynchosia bracteata*	Kamal vel	Papilionaceae	C
43	*Rhynchosia minima*		Papilionaceae	C
44	*Rivea hypocrateriformis*	Faug, Fag	Convolvulaceae	C
45	*Tinospora cordifolia*	--	Menispermaceae	C
46	*Trichosanthes brackteata*	Ratrani	Cucurbitaceae	C
47	*TrichosanthesCucumarina*	--	Cucurbitaceae	C

HERBS

S. No.	Botanical Name	Common Name	Family	Local Status
1.	*Abelmoschus manihot*	JungliBhindi	Malvaceae	C
2.	*Abutilon indicum*		Malvaceae	C
3.	*Acalypha ciliata*		Euphorbiaceae	C
4.	*Acalypha malabarica*		Euphoriaceae	C
5.	*Acalypha indica*		Euphorbiaceae	C
6.	*Acanthospermum hispidum*		Compositae	A
7.	*Achyranthus aspera*	UltaKanta	Amraldaceae	A
8.	*Aeschynomene indica*		Papilionaceae	C
9.	*Ageratum conyzoides*		Compositae	C
10.	*Aloe vera*	Patha	Lilaceae	R
11.	*Alysicarpus hamosus*	---	Papilionaceae	C
12	*Alysicarpus longifolius*	---	Papilionaceae	C
13.	*Alysicarpus procumbens*		Papilionaceae	C

14.	*Alysicarpus rotundifolia*	--	Papilioaceae	C
15.	*Alysicarpus tetragonoloba*	--	Papilionaceae	C
16.	*Alysicarpus vaginalis*	--	Papilionaceae	C
17.	*Ammania baccifera*		Lythraceae	C
18.	*Amaranthus gracilis*		Ammrantaceae	C
19.	*Amaranthus hybridus*		Ammrantaceae	C
20.	*Amarantus spinosus*	--	Ammrantaceae	C
21.	*Amaranthus tricolor*		Ammrantaceae	C
22.	*Argemone maxicana*	--	Papaveraceae	A
23.	*Bidens bipinnata*		Compositae	A
24.	*Baccopa monneiri*	Brahmi	Scrophulanaceae	
25.	*Blepharis liniriaefolia*	--		C
26.	*Blumea glomerata*	--	Compositae	C
27.	*Borreria stricta*	--	Rubiaceae	A
28.	*Brassica nigra*	KaliRai	Cruciferae	L
29.	*Cannabis sativa*	Bhang	Cannabianaceae	R
30.	*Cassia abrus*	Chimod	Caesalpiniaceae	C
31.	*Cassia pumila*		Caesalpiniaceae	C
32.	*Cassia tora*	Puwad	Caesalpiniaceae	C
33.	*Celosia argentea*		Ammrantaceae	C
34.	*Centella asiatica*	Brahmi	Apsiaceae	R
35.	*Chenopodipum album*	Chil	Chenoprodiaceae	C
36.	*Cleome gynandra*		Capparaceae	C
37.	*Cleome viscosa*		Capparaceae	C
38.	*Clitoria biflora*		Papilionaceae	L
39.	*Commelina benghalensis*		Commelinaceae	A
40.	*Commelina haskami*	---	Commelinaceae	A
41.	*Commelina paludosa*	--	Commelinaceae	A

42.	*Corchorus acutangulus*	---	Tiliaceae	L
43.	*Corchorus capsularis*	---	Tiliaceae	L
44.	*Corchorus depressus*	---	Tiliaceae	L
45.	*Coronopus didymus*	---	Cruciferae	L
46.	*Crotolariafilipes*	---	Papilionaceae	R
47.	*Crotolaria juncea*	Saniya	Papilionaceae	L
48.	*Crotolaria medicaginea*	Ran Methi	Papilionaceae	A
49.	*Curcuma amada*	--	Zingiberaceae	L
50.	*Curcuma inodora*	--	Zingiberaceae	L
51.	*Cyanotis fasciculata*	---	Commelinaceae	L
52.	*Cyathocline purpurea*	--	Compositae	C
53.	*Cyperus compressus*		Cyperaceae	C
54.	*Cyperus rotundifolia*	---	Cyperaceae	C
55.	*Desmodium dichotomum*	Shal parni	Papilionaceae	C
56.	*Desmodium gangeticum*	---	Papilionaceae	C
57.	*Desmodium rotundifolium*	---	Papilionaceae	C
58.	*Desmodium neomaxicum*	---	Papilionaceae	C
59.	*Desmodium trifolium*	---	Papilionaceae	C
60.	*Dipteracanthus patulus*	---	Acanthaceae	L
61.	*Dipteracanthus micranthus*	---	Acanthaceae	L
62.	*Dipteracanthus prostratus*		Acanthaceae	L
63.	*Echinops echinatus*	---	Compositae	C
64.	*Ecliptaalba*	Bhangaro	Compositae	C
65.	*Eclipta prostrata*	Bhangaro	Compositae	C
66	*Euphorbia geniculata*	---	Euphorbiaceae	C
67	*Euphorbia hirta*	---	Euphorbiaceae	C

68	*Euphorbia hypercifolia*	--	Euphorbiaceae	C
69	*Euphorbia prostrata*	---	Euphorbiaceae	C
70	*Evolvulus alsinoides*	Kalishankhavali	Convolvulaceae	C
71	*Haplanthus tentaculatus*	--	Acanthaceae	L
72	*Haplanthus verticillatus*	---	Acanthaceae	L
73	*Hydrilla verticillata*	---	Hydrocharitaceae	C
74	*Hygrophila auriculata*	---	Acnthaceae	C
75	*Indigofera cordifolia*		Papilianaceae	A
76	*Indigofera tinctoria*	--	Papilionaceae	C
77	*Justicia repens*	---	Acanthaceae	C
78	*Lepidagathis trinervis*	---	Acanthaceae	A
79	*Lapidium sativum*	--	Cruciferae	C
80	*Leucas aspera*	Kubi	Labiatae	A
81	*Leucas cephalotes*	Kubo jungli	Labiatae	C
82	*Leucas zeylanica*	Kubo	Labiatae	C
83	*Limnophila indica*		Scrophulariaceae	C
84	*Lindenbergia indica*	Patharchati	Scrophulariaceae	
85	*Nervilia araguana*	---	Orchidaceae	R
86	*Neuracanthus sphaerystachys*	---	Acanthaceae	R
87	*Ocimun canum*	Jungli tulsi	Labiatae	C
88	*Phyllanthus niruri*	BhoyAmli	Euphorbiaceae	A
89	*Physalis maxima*	Popatiya	Solanaceae	A
90	*Physalis minima*	Popatiya	Solanceae	C
91	*Physalis peruviana*	---	Solanaceae	C
92	*Pluchea lanceolata*		Compositae	C
93	*Portulacea oleracea*	Moti luni	Portulacaceae	R

94	*Portulacea quadrifida*	Zini luni	Portulacaceae	R
95	*Pulicaria angustifolia*	---	Compositae	C
96	*Riungia parviflora*		Acanthaceae	R
97	*Ruelia tuberosa*	---	Acanthaceae	C
98	*Seasmum indicum*	Tal	Padaliaceae	C
99	*Sesbania bispinosa*		Papilionaceae	L
100	*Sida cordifolia*	---	Malvaceae	C
101	*Sida glutinosa*	---	Malvaceae	C
102	*Smithia sensitiva*	---	Papilionaceae	C
103	*Smithia conferata*	---	Papilionaceae	C
104	*Solanum nigrum*		Solanaceae	C
105	*Solanum surattense*	Bhoi ringni	Solanacae	C
106	*Sphaeranthus indicus*	Gorakh mundi	Composite	C
107	*Tephrosia labialis*	---	Papilionaceae	C
108	*Tephrosia pumila*	---	Papilionaceae	C
109	*Tephrosia purpurea*	---	Papilionaceae	C
110	*Tephrosia tenuis*	---	Papilionaceae	C
111	*Tephrosia villosa*	---	Papilionaceae	C
112	*Tribulus terrestris*	Gokharu	Zygophylaceae	R
113	*Trichodesma zeylanica*	---	---	R
114	*Tridax procumbens*	KaliMendhi	Composite	A
115	*Triumfetta pentandra*	---	Tiliaceae	C
116	*Triumfetta rhomboidea*	---	Tiliaceae	C
117	*Triumfetta rtudifolia*		Tiliaceae	C
118	*Tubipora acaulis*	---	Acanthaceae	C
119	*Urena lobata*		Malvaceae	L
120	*Urginea indica*	JungliPiyaj	Liliaceae	C
121	*Vernonia anthihelmintica*	Kali jiri	Composite	R

122	*Vermonia cinerea*	---	Composite	A
123	*Vicoa auriculata*	---	Composite	A
124	*Vicoa indica*		Compsite	L
125	*Xanthium strumarium*	Gokharu	Composite	A
126	*Zornia diphylla*	Samar ani	Papilionaceae	C
127	*Zornia gibbosa*	---	Papilionaceae	C

GRASSES

S. No.	Botanical Name	Common Name	Family	Local Status
1	*Alloteropsis cimicina*	---	Graminae	L
2	*Andropogon pertusa*		Graminae	L
3	*Apluda aristata*		Graminae	C
4	*Apluda mutica*		Graminae	C
5	*Aristida adscensionis*	Lapdu	Graminae	C
6	*Aristida funiculata*	Laso lampdo	Graminae	L
7	*Arthroxon serrulatus*	---	Graminae	C
8	*Brachiaria racemosa*	--	Graminae	C
9	*Cenchrus setigerus*	Dhaman	Graminae	L
10	*Chloris dolicostachys*		Graminae	C
11	*Chloris montana*	---	Graminae	C
12	*Chloris virgata*	---	Graminae	C
13	*Coix lachryma Jobi*	---	Graminae	R
14	*Cymbopogan martinii*		Graminae	L
15	*Cynodon dactylon*	Dub	Graminae	A
16	*Dendrocalamus strictus*	Bamboo	Graminae	A
17	*Dicanthium annalatum*	---	Graminae	A
18	*Digitaria adscendens*	----	Graminae	C
19	*Digitaria granularis*	---	Graminae	C

20	*Dimeria ornithopoda*	---	Graminae	C
21	*Echinochloa colonum*	Samo	Graminae	A
22	*Eragrostis ciliaris*	---	Graminae	A
23	*Eragrostis japonica*	---	Graminae	L
24	*Eragrostis pilosa*	---	Graminae	L
25	*Eragrostis viscosa*		Graminae	L
26	*Hteropogon contortus*	Surawala	Graminae	A
27	*Melanocenchrus jacquemontii*	---	Graminae	A
28	*Oryza sativa*		Graminae	C
29	*Paspalidium flavidum*	---	Graminae	C
30	*Paspalidium geminatus*	---	Graminae	C
31	*Saccharum spontaneum*	Kans	Graminae	C
32	*Setaria tomentosa*	---	Graminae	C
33	*Setaria verticillata*		Graminae	L
34	*Sorghum vulgare*	Baru	Graminae	C
35	*Sporobolus marginatus*	---	Graminae	L
36	*Spodiopogon rhizophorus*	---	Graminae	L
37	*Tetrapogon tennelus*	---	Graminae	L
38	*Themeda triandra*	Ratad	Graminae	L
39	*Urochloa panicoides*	---	Graminae	L
40	*Vetiveria zizanioides*	Khas	Graminae	L

EPIPHYTES

1	*Venda tessilata*	Vahi Hankal	Orchidaceae	C
2	*Aeridus maculosum*	--	--	R

PARASITES

1	*Cuscuta reflexa*	Amar Bel	Conolvulaceae	C
2	*C. hylina*	Amar Bel	Conolvulaceae	C
3	*Dendrophoetha fulcata*	Vahi Hankal	Loranthaceae	C

PTERIDOPHYTES

1	*Euquisetum sp.*	-	Equisetaceae	R
2	*Marselea sp.*	--	Marsiliaceae	C
3	*Ophioglosum costum*	--	Ophioglosaceae	R
4	*Cheilanthus tennuifolia*	-	Adiantaceae	C
5	*Adiantum caudatum*	-	Adiantaceae	C
6	*Ampeloperus prolifera*	-	-	R
7	*Actinopterua radiatum*	Morpankhi	-	A

ANNEXURE - 15

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF PLANT SPECIES SERVE AS FOOD TO WILD ANIMALS

S. No	Name of Plant	Name of species depend for food	Part of plant eaten
1	*Diospyros melanoxylon*	Sloth Bear	Fruit
2	*Ficus glomerata*	Sloth Bear	Fruit
3	*Casria fistula*	Sloth Bear	Fruit
4	*Lantana camara*	Sloth Bear	Fruit
5	*Puraria tuberosa*	Sloth Bear	Tuber
6	*Phoenix sylvestris*	Sloth Bear	Fruit
7	*Carissa congesta*	Sloth Bear	Fruit
8	*Madhuca latifolia*	Sloth Bear	Flower
9	*Borhaavia diffusa*	Porcupine	Root
10	*Puraria tuberosa*	Porcupine	Tuber
11	*Madhuca latifolia*	Flying squirrel	Pith of twing, flower, rind of fruits
12	*Syzygium heynianum*	Flying squirrel	Embryo of unripe fruits
13	*Termirulia tomentosa*	Flying squirrel	Pith of twigs
14	*Sehima nervosum*	Four-horned antelope	Whole plant
15	*Heteropogon contortus*	Four-horned antelope	Whole plant
16	*Lannea grandis*	Hanuman Langurs	Leaves
17	*Zea mays*	Hanuman Langurs	Cob
18	*Anogeissus latifolia*	Hanuman Langurs	Bark
19	*Ficus glomerata*	Hanuman Langurs	Bark
20	*Albizia odoratissima*	Hanuman Langurs	Bark
21	*Gmelina arborea*	Hanuman Langurs	Bark
22	*Butea monospera*	Flying fox	Flower
23	*Ficus religiosa*	Flying fox	Fruit
24	*Albizia odoratissima*	Flying fox	Leaves
25	*Maducu latifolia*	Flying fox	Flower, rind of fruits

ANNEXURE - 16

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF SPECIES OF ETHNOBOTANICAL VALUE IN AND AROUND OF PHULWARI

S. No.	Use of plant	Used by	Name of species useful
1.	Fruits used for nutrition	Bhils, GarasiasK hathodis	*Mangifera indica, Ficus glomerata, Madhuca latifolia, Diospyros melanxylon, Puraria tuberosa, Carissa congesta, Phoenix sylvestris, Syzgium heynianum, S. jambos, Pithocelobium deulce, Cordia mixa*
2.	Seeds used as delicacy		*Sterculia urens, Mangifera indica, Terminalia bellirica*
3.	Weather forcasting		*Lannia grandis, Azadiradita indica,*
4.	Henna		*Impetiance balsamina, Lindenbergia muraria*
5.	Roots used as delicacy		*Bombex ceiba, Puraria tuberosa,Ceropegia bulbosa*
6.	Tonic		*Chlorophytum borivillianum, Asparagus racemosus*
7.	Adornment		*Butea monosperma*
8.	Indigenous medicine		*Ensets superbum,Chlorophytum borivillianum, C. tuberosum, Butea monosperma, Acacia catechu, Urgenia indica, Centella asiatica, Acacia leucophloea, Holoptelia integrifolia, Emblica officinalis,Capparis seperia, Terminalia arjuna, Terminulia bllerica,*
9.	Tatoo		*Cheilenthes tennuifolia*
10.	Dry Farm-fence		*Alangium salvifolium Butea monosperma, Zizyphus mauritiana*
11.	Live farm fens		*Euphorbia nerifolia, Jatropha curcas, Delonix elata*
12.	Shade		*Ficus infectoria*
13.	Country liquer		*Madhuca latifolia, Terminalia tomentosa,*
14.	Oil seed		*Goizotea tomentosa, Madhuca latifolia, Jatropha carcus, Pongamia pinnata*
15.	Fibre		*Sterculia urens, Butea monosperma, Helicteres isora, Pongamia pinnata, Hdoptelia integrifolia.*

ANNEXURE - 17

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

CATEGORY WISE LIST OF NATURAL AND ARTIFICIAL WATER SOURCES

S.	Cate-gory	Name of Perennial water source including type	Location	Forest Bock	Comptt. No.
1	**2**	**3**	**4**	**5**	**6**
1	Natural	Wakal River & Tributries (Fluvial)	Birothi to Patharpadi via Panarwa	HarwaDeviPhulwari	-7,10,11,15,16,17 1,2,4,5,15
2		PhulwariKiNal (Spring)	Near Hukeri	Phulwari	19
3		KatawaliJher (Spring)	Near Ambavi village	Daiya	4
4		Kala Pani (Spring)	Near Lathuni village	Adahaldu	3
5		DhowaniyaKund	Near DhowaniyaKundAnicut	Dhedmariya	-
6	Artificial	JaniwasDam	Near village Janiwas	Asawada	Bordering comptt. 1
7		PadaKhadra Anicut	Near Mamer village	Mamer	Bordering comptt. 2
8		Buxa-ka-Naka Dam	Near Mahadi village	Umaria	Bordering comptt. 6
9		Hakarwa Dam	Near Mamer village	Mamer	Bordering comptt. 6
10		Savan KyaraDam	Near Savan Kyara village	Umaria	Bordering Comptt. 8

11		DhowaniyaKundAnicut	Near GhodaPadiya	Dhedmariya	-
12		Gamdi ki NalAnicut	Near GamdiVillage	Devli	-
13		ChampaKhetAnicut	Near ChampaKhetVillage	Devli	-
14		Bhildi mata Water Hole	Near BhildiMata	Phulwari –ki-nal	-
15		KatawliJerAnicut	Inside KatawliJer	Daiya	-
16	Artificial	Bora KodraAnicut	Near Eco-restoration closure II Range Panrwa	Daiya	-
17		Well Godalwara	Godalwara	Umariya	-
18		Well ChakKaduaMahuda	ChakKaduaMahuda	Dhedmariya	-
19		Well Antaliya	Antaliya	Dhedmariya	-
20		WellDhedmariyaForest Chowki (Upli)	Dhedmariya	Dhedmariya	-
21		Well Mahadev Khadra	Mahadev KhdraNallah	Mamer	-
22		Well PadaKhadra	PadaKhadraNallah	Mamer	-
23		LIS Panarwa	Panarwa - Kewadi Road	Phulwari-ki -nal	-

ANNEXURE - 18

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

INFORMATION REGARDING VEHICLE

Existing : -

S.No.	Category of Vehicle	Total Run so far	Present Condition
1	2	3	4
1	Jeep 1 RJ27-U- 0971	1,83,000 km	Verge of Condemnation
2.	Canter 1 RHG 3348		Verge of Condemnation
3.	Motor-cycle 3 RJ27-2M-5734 (Bullet) RJ27-2M-5498 (Bullet) RRJ- 3594 (Rjadoot)	-	Verge of Condemnation
4.	Truck	-	-
5.	Tractor	-	-

Total number of vehicles present are inadequate for managing the park activities. These vehicles are very old and on the verge of condemnation. The old vehicles should be replaced by new vehicles. Besides this adequate number of drivers are not available.

Following is the requirement of the vehicles for the sanctuary.

Requirement :

S.No.	Name of the vehicle	No. required	Amt.Reqd. (Rs. in lacs)
01	Truck / canter	1	7.00
02	Jypsy/Bolero	1	7.00
03	Jeep DI. (3 for ROs)	3	15.00
04	Motor cycles (For all nine Nakas)	9	4.50
05	Tractor, Trolley, Tanker	1 Set	7.00
05	Cycles (Two for each Naka & two for ACF HQ)	11	0.33
	TOTAL		**40.83**

ANNEXURE - 19

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

INFORMATION REGARDING WEAPONS

S. No.	Name of the Office	Number of Weapons							
		Revolver		Rifle		Gun Muzzle loader 32Bor / Muskat Topidar		Gun (SBBL 12 bore)	
		Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
1	ACF	-	1	-	-	-	-	1	-
2	RFO Kotra	-	1	-	-	2	-	-	2
3	RFO Panwarwa	-	1	-	-	3	-	-	2
4	RFO Mamer	-	1	-	-	2	-	-	2
	Total	-	4	-	-	7	-	1	6

Proposed — The weapons\ammunitions are inadequate. It is proposed that every Range Officer should have one revolver issued. A.C.F. should have one revolver also. At every Range office there should be two double Barrel (DBBL) 12 bore guns. As per the govt. order adequate safety and security measures should be ensured.

ANNEXURE -20

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

INFORMATION REGARDING WIRELESS STATIONS

S.No	Name of wireless stations	Location	Status (static/mobile
1	Wireless Station Kotra (Range HQ)	Kotra	Fixed
2	Wireless Station Panarwa (Range HQ)	Panarwa	Fixed
3	Wireless Station Mamer (Range HQ)	Mamer	Fixed
4	Wireless Station Nalwa	Patherpadi	Fixed
5	Wireless Station Nalwa	Nalwa	Fixed
6	Wireless Station Daiya	Daiya	Fixed
7	Wireless Station Ambasa	Ambasa	Fixed
8	Wireless Station Birothi	Birothi	Fixed
9	Wireless Station Mahad	Mahad	Fixed
10	A C F Jeep	Kotra	Mobile
11	Hand set	Pamarwa	Hand set
12	Hand set	Panarwa	Hand set
13	Hand set	Panarwa	Hand set
14	Hand set	Dhedmariya	Hand set
15	Hand set	Mamer	Hand set
16	Hand set	Mahad	Hand set
17	Hand set	Kotra	Hand set
18	Hand set	Mahadi	Hand set

ANNEXURE - 21

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

INFORMATION REGARDING EXISTING AND PROPOSED WIRELESS SETS

S.No.	Name of Office	Wire less sets						Remark
		Fixed		Mobile		Hand set.		
		Exis.	Propo.	Exis.	Prop.	Exis.	Propo.	
1	ACF	-	-	0	1	2	1	
2.	RFO Kotra	5	-	-	-	9	-	
3.	RFO Panarwa	5	-	-	-	5	-	
4.	RFO Mamer	5	-	-	-	8	-	
	Total	**15**	**-**	**0**	**1**	**24**	**1**	

ANNEXURE - 22

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

INFORMATION REGARDING EXISTING AND PROPOSED CHECKPOINTS & BARRIERS

A : Existing Checkposts & Barriers :

S.No.	Range	Barrier Location	Naka oprating it	Type (Manned/un manned
1	Kotra	Patharpadi	Patharpadi	Manned*
2	Panarwa	Nalwa	Panarwa	Manned
3	Panarwa	Daiya	Daiya	Manned
4	Mamer	Mahad	Mahad	Manned

* No separate staff is available for operating the barriers. Regular protection staff is doing this duty along with their protection duties.

B :Proposed Checkposts & Barriers :

S.No.	Range	Barrier Location	Naka
1	Kotra	Gamri	Birothi
2	Mamer	Mahadi	Mahadi
3	Panarwa	Ambasa	Ambasa

ANNEXURE - 23 (i)

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

INFORMATION REGARDING EXISTING &
PROPOSED CHOWKI BUILDINGS

A: Existing Chowki

S. No.	Range	Name of Building	Location	Use
1	Panarva	Guard Chawki	Mal Chowki	Official Work
2	Panarva	Guard Chowki	Ambavi	Official Work
3	Panarva	Guard Chowki	Birothi	Official Work
4	Panarva	Guard Chowki	Nalva	Official Work
5	Panarva	Guard Chowki	Ambasa	Official Work
6	Panarva	Guard Chowki	Panarva	Official Work
7	Kotra	Guard Chowki	Khanchan	Residence of Guard
8	Kotra	Guard Chowki	Dungariya	Residence of Guard
9	Kotra	Guard Chowki	Aarivara	Residence of Guard
10	Mamer	Guard Chowki	Koldarrah	Residence and Office
11	Mamer	Guard Chowki	Jher	No use

B: Proposed Chowki

S.No	Range	Location	Cost (Lac)
1	Mamer	Umriya	10.00
2	Mamer	Bedadhar	10.00

C: Proposed Barrack

S.No	Range	Location	Cost
1.	**Mamer**	**Range Campus Mamer**	**50.0 lacs**
2.	**Mamer**	**Mahad**	**25.00 lacs**
2.	**Kotra**	**Naka Campus Patherpadi**	**10.0 lacs**

ANNEXURE - 23(ii)

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

INFORMATION REGARDING EXISTING & PROPOSED NAKAS

A: Existing Nakas

S.No	Range	Location of Naka
1	Panarva	1. Daiya
		2. Ambasa
		3. Panarva
		4. Birothi
2	Mamer	4. Mahad
		5. Mamer
		6. Mahari
3	Kotra	7. Patherpari
		8. Dhedmariya

B: Proposed Nakas

S.No	Range	Location	Cost (Lac)
1	Mamer	Koldarrah	25.00
2	Mamer	Bedadhar	25.00

ANNEXURE - 23(iii)

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

A C F OFFICE AND RANGE BUILDINGS

(A) A C F Office (H.Q. Kotra)

S.No.	A.C.F. Office	A.C.F. Residence	Existing (Yes/No.)	Proposed Building	Cost of proposed Building (in lac)
1	**Kotra**	**Kotra**	**Yes**	**1**	**30**
	Total			1	30

(B) Range Office

S.No.	Name of Range	Existing (Yes/No.)	Proposed Range Building	Cost of proposed Building (in lac)
1	**Kotra**	**Yes**	**-**	**-**
2.	**Panarva**	**Yes**	**-**	**-**
3.	**Mamer**	**Yes**	**-**	**-**
	Total	-	-	-

ANNEXURE – 24

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF EXISTING AND PROPOSED ROAD

(Index : E= Earthen Road, M=Metal Road, B=Black Topped Road, FR = Forest Road, PR = PWD Road, DR = District Road, SH = State Highway, NH = National Highway

Location of Roads	**From / To**	**Km**	**Type**
Path within Sanctuary	1. Khachan to Mahad	25	FR,E,
	2. Daiya to Ambasa	10	PR, B
	3. PatharPari to Umaria	15	FR, M,E
	4. Dia to Jher	5	FR,E,
	5. Dhedmariya to Dolariya	10	FR, E
	6. Ambasa to Manpur via Adhaldu	30	FR, PR, E
	7. SomGhata to Sarwan	6	E,FR
	8. Kotra to Som	40	B, PR, SH
Foot track within sanctuary	1. Umaria to Mamer via Bhimatalai	15	E, FR,
	2. BhaderBavji to Gamdi	10	E,FR,
	3. PhulwariKiNal to Manasi	5	E,FR
	4. Mandwa to Manasi	5	E,FR
	5. Phuldariya to Birothi	8	E, FR,
Out side sanctuary (at Periphery)	1. Dewla to Kotra	50	PR, DR, B
	2. Kotra to Mamer	25.	PR, DR,B
	3. Som to VijayNagar	25	PR, B, NH
	4. VijayNagar to Kherbrahma	50	PR, B, NH

ANNEXURE – 25

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

CARNIVORES CONFLICT DATA

S.No.	Year	Human loss	
		Death	Injury
1	2016-17	2	0
2	2017-18	2	0
3	2018-19	1	0
4	2019-20	0	0
5	2020-21	4	0
6	2021-22	3	0
7	2022-23	2	0
8	2023-24	0	0
9	2024-25	1	0

ANNEXURE– 26

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

INFORMATION REGARDING CATTLE POPULATION IN VILLAGES WITHIN SANCTUARY AREA AND WITH IN 10 KM LIMITS OF SANCTUARY AREA

(A) LIST SHOWING CATTLE POPULATION IN PHULWARI SANCTUARY

Tehsil	Village	Cow	Buffelo	Goat / Sheep	Camel	Poultry
1	2	3	4	5	6	7
Kotra	01 Dhedmariya	130	62	260	4	512
	02 Gura	155	62	193	-	-
	03 Amliya	39	43	26	-	43
	04 Palesar	153	53	160	-	241
	05 Bilvan	115	43	246	5	445
	06 Sarli	30	7	39	-	74
	07 Khajuria	20	7	31	-	53
	08 Sakma ji mata	-	-	-	-	-
	09 Upla Thala	59	30	113	-	116
	10 Thodimal	-	-	-	-	-
	11 Ariwara	41	14	63	-	123
	12 Patharpari	228	101	392	-	674
	13 Nal Digavari	10	2	11	-	21
	14 Saktalia	5	-	7	-	-
	15 Chamunda Mahua	3	-	7	-	-
	16 Badli	24	-	70	-	69
	17 Umaria	46	-	95	-	180
	18 Poptali	28	-	50	10	50
	19 Sisvia	23	-	16	-	44
	20 Amlea Deh	52	45	107	12	92
	21 Gaupipla	53	-	61	6	52
	22 Dungaria	15	-	16	-	8
	23 Chauri Magari	15	-	-	-	-
	24 Arjunpura	8	-	28	-	13
	25 Chauki	12	-	11	-	-
	26 Kanjuva	9	-	17	6	18
	27 Vali	31	-	54	6	55
	28 Godalwara	26	-	30	6	64
Kotra	29 Khakhariya	25	-	54	-	67

	30 Kundal	8	-	8	-	-
	31 Kansan	77	-	138	-	145
	32 Talale	300	108	1040	5	752
	33 Mafari	44	43	286	4	86
	34 Bogdi Kala	36	10	173	2	80
	35 Bordi Khurd	67	218	-	-	120
	36 Nal	254	133	690	-	392
	37 Sara	99	20	316	8	221
	38 Luk	79	117	57	2	63
	39 Rajpura	67	8	31	2	75
	40 Bali karni	87	21	52	3	71
	41 Savankyara	96	8	42	-	-
	42 Sikla	138	34	73	9	122
	43 Gura	74	10	29	2	45
	44 Goramari	141	26	47	3	103
	45 Meri	34	7	31	1	27
	46 Koldara	69	3	33	1	50
	47 Hasreta	97	24	39	2	42
	48 Nakola	36	8	7	-	15
	49 Sandol	4	-	5	-	7
	50 Vav viran	127	46	25	10	204
	51 Man daval	18	5	72	1	3
	52 Seri	97	8	217	2	289
	53 Sekli	177	50	576	1	419
	54 Budiya	107	41	194	-	150
	55 Vasela	89	27	22	2	94
	56 Dairi	222	118	715	1	247
	57 Medi	59	19	40	-	-
	58. Luhari	90	21	229	-	124
	59. Porkola	24	13	125	-	41
	60. Amari	73	40	114	-	123
	61 Mahad	92	9	145	-	68
	62 Khokhara	158	64	210	-	195
	63 Jher	33	14	29	-	11
	64 Dia	59	36	76	-	97
	65 Dotar	73	16	-	-	-
	66Bedadar	28	-	34	-	55
	67 Kharavani	71	36	96	-	81
	68 Ashwara	31	9	45	-	51
	69 Sura	29	10	62	-	28
	70 Amlia	51	27	64	-	43
Kotra	71 Manasi	234	108	136	-	90

	72 Dhanodar	54	21	17	-	37
	73 Gura	83	16	28	-	21
	74 Maldar kala	49	12	19	22	22
	75 Maldar Khurd	209	76	76	-	174
	76 Digavari kala	121	41	40	-	100
	77 Digavari khurd	134	100	57	3	152
	78 Kausa	140	45	46	-	88
	79 Padalwara	38	12	9	-	10
	80 Kana padar	113	12	77	-	-
	Total	**6251**	**2311**	**8828**	**133**	**8498**
Jhadol	81 Jetuwara	57	13	61	-	-
	82 Hirumal	41	-	90	-	-
	83 Kunda	146	33	289	-	13
	84 Gamaru	60	33	91	-	3
	85 Bitta	228	43	107	-	60
	86 Birothi	199	29	286	-	-
	87 Nayagaon	74	15	274	-	13
	88 Bhakumba	179	38	292	-	-
	89 Newaj	37	8	77	-	2
	90 Kunda	93	21	66	-	11
	91 Dovi	170	24	215	-	-
	92 Adkaliya	159	22	269	-	-
	93 Nal nanama	68	22	124	-	14
	94 Gudli	328	44	154	-	-
	95 Rohimal	398	75	416	-	89
	96 Basiwara	293	190	232	-	771
	97 Daiyya	472	391	22	-	772
	98 Ambasa	138	22	29	-	76
	99 Mal	239	80	4	-	736
	100 Vahighatia	152	56	14	-	71
	101 Kavel	254	57	15	-	700
	102 Bujha	81	54	12	-	75
	103 Sandavasa	77	18	10	-	34
	104 Sundala	191	37	31	-	53
	105 Chhali Bokara	287	95	595	8	35
	106 Sarwan	218	43	392	-	93
	107 Lathuni	193	52	190	-	97
	108 Tinduri	385	231	923	2	913
	109 Ambavi	97	16	8	-	24
	110 Amlia	502	199	626	3	87
Jhadol	111 Puipalwara	380	70	478	6	994

	112 Kodar	202	39	330	-	78
	113 Umaria	168	16	136	-	-
	114 Gura	87	21	36	3	-
	115 Burawara	56	20	119	2	-
	116 Ada Haldu	71	22	82	-	-
	117 Bhoiwara	69	31	26	-	-
	118 Bhagorawas	159	33	188	1	67
	119 Bhesana	122	35	147	-	-
	120 Parmar	202	41	180	-	-
	121 Kot	224	78	356	4	-
	122 Mandawa	253	68	370	2	41
	123 Dharwan	462	162	1077	4	29
	124 Amda	160	109	174	-	-
	125 Panarwa	36	12	32	-	39
	126 Kahjurna	183	56	66	-	31
	127 Anjroli Dolji	49	12	17	-	-
	128 Anjroli kala	76	34	14	1	-
	129 Surimala	28	-	11	-	-
	130 Komaria	13	6	16	-	12
	131 Babarebara	131	28	131	4	-
	132 Anjroli-Khas	59	24	151	-	-
	133 Dolaria	166	37	253	-	-
	134 Dolaria	40	21	9	6	0
	Total	**9305**	**2927**	**10681**	**40**	**6022**
	Grand Total	**15556**	**5238**	**19509**	**173**	**14520**

(B) List of cattle population around the Phulwari Sanctuary (Upto 10 km from the periphery)

Tehsil	Village	Cow	Buffelo	Goat / Sheep	Camel	Pultary
Kotra	1. Kotra	157	62	66	-	223
	2. Gadhisarna	130	19	78	-	184
	3. Nichli subri	104	1	19	-	85
	4. UpliSubri	39	3	5	-	85
	5. B harod	19	2	6	-	18
	6. Badla	12	-	3	-	22
	7. Lamba-Haldu	106	43	252	-	314
	8. NichlaThala	75	18	17	-	133
	9. Bhuri - Debar	49	13	99	-	36
Kotra	10. Luna	9	22	89	-	36

	11. Jogibad	688	183	245	2	705
	12. Juda	107	2	32	20	230
	13. Siyara	81	9	10	-	33
	14. Tadala	105	25	17	-	62
	15. Junipadar	108	17	20	-	89
	16. Punavali	25	3	16	-	29
	17. NichliKundal	74	-	19	-	53
	18.Upli kundal	83	5	14	-	48
	19. Kantharia	41	5	5	-	33
	20. Nayar	72	9	10	-	30
	21. Umari-padar	42	6	5	-	39
	22. Dadmiya	74	7	18	-	37
	23. Bhulagi-Amli	21	9	26	-	-
	24. Togna	43	3	5	-	47
	Total	**2364**	**466**	**1061**	**22**	**2571**
Jhadol	25. Gejvi	338	100	418	-	-
	26. Kitavaton ka vas	230	32	372	-	-
	27. Ajaipura	112	17	125	-	-
	28. Ranpur	210	59	182	-	-
	29. Kunda	311	51	382	-	-
	30. Bagali	199	19	111	-	-
	31. Sadmari	67	7	108	-	-
	32. Javagia	33	13	37	-	-
	33. Bhemaria	162	77	163	-	-
	34. Kakga (pilak)	23	-	14	-	-
	35. Doli	18	2	32	-	-
	36. Kavaraya	144	29	168	-	-
	37. Dimari	91	27	243	-	-
	38. Adaval	146	21	19	-	8
	39. Auda	288	194	440	1	44
	40. Saverali	38	9	43	-	-
	41. Sahiwara	100	40	183	-	13
	42. Kiliya khari	98	18	168	-	-
	43. Dalela	53	6	65	-	17
	44. Parda	47	9	80	-	-
	45. Amada	143	40	92	-	-
	46. Bala	296	-	150	-	-
Jhadol	47. Karda	43	-	75	-	-

	48. Adalakara	64	20	102	2	-
	49. Amlata	97	27	113	-	-
	50. Garanvas	280	73	535	-	89
	51. Som	445	214	571	-	919
	52. Karel	423	176	563	2	68
	53. Jamti	445	158	1031	-	33
	Total	**4734**	**1438**	**6585**	**5**	**1191**
	Grand Total	**7098**	**1904**	**7646**	**27**	**3762**

ANNEXURE – 27

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF LAND USE PATTERN

(A) LAND USE PATTERN OF THE VILLAGES IN THE SANCTUARY AREA (IN HECT.)

Tehsil	Village	Agricul -ture	Pasture	Wastland	No. of Wells	No. of ponds
1	2	3	4	5	6	7
Kotra	01 Dhedmariya	20	45	20	16	0
	02 Gura	21	86	-	18	0
	03 Amliya	5	4	-	2	0
	04 Palesar	16	37	-	17	0
	05 Bilvan	33	64	5	13	0
	06 Sarli	7	10	-	3	0
	07 Khajuria	8	7	-	3	0
	08 Sakma ji mata	3	-	-	-	0
	09 Upla Thala	14	15	-	21	0
	10 Thodimal	1	-	-	-	0
	11 Ariwara	5	6	-	2	0
	12 Patharpari	32	-	25	32	0
	13 Nal Digavari	1	-	-	-	0
	14 Saktalia	1	-	-	-	0
	15 Chamunda Mahua	1	-	2	3	0
	16 Badli	31	47	5	11	0
	17 Umaria	8	-	-	5	0
	18 Poptali	6	-	10	16	0
	19 Sisvia	4	-	7	-	0
	20 Amlea Deh	13	24	3	-	0
	21 Gaupipla	52	47	-	22	0
	22 Dungaria	9	15	15	-	0
	23 Chauri Magari	5	8	4	3	0
	24 Arjunpura	-	-	-	-	-
	25 Chauki	4	2	-	3	0
	26 Kanjuva	5	4	-	9	0
	27 Vali	3	8	-	3	0
	28 Godalwara	3	8	3	19	0
	29 Khakhariya	24	12	-	15	0
	30 Kundal	8	-	7	6	0
	31 Kansan	3	3	2	6	0

Kotra	32 Talale	7	16	4	5	0
	33 Mafari	211	11	52	5	0
	34 Bogdi Kala	40	31	3	-	0
	35 Bordi Khurd	14	-	-	-	0
	36 Nal	20	21	5	-	0
	37 Sara	143	95	14	4	0
	38 Luk	51	-	20	2	0
	39 Rajpura	90	-	32	5	0
	40 Bali karni	75	22	12	7	0
	41 Savankyara	63	-	149	-	0
	42 Sikla	73	-	18	-	0
	43 Gura	141	-	50	2	0
	44 Goramari	70	25	59	-	0
	45 Meri	139	35	29	3	0
	46 Koldara	22	9	-	-	0
	47 Hasreta	64	15	6	-	0
	48 Nakola	87	18	5	4	0
	49 Sandol	24	-	-	-	0
	50 Vav viran	7	-	4	-	0
	51 Man daval	69	70	30	3	0
	52 Seri	4	6	-	5	0
	53 Sekli	42	35	45	5	0
	54 Budiya	55	65	18	35	0
	55 Vasela	54	-	17	35	0
	56 Dairi	71	38	96	18	0
	57 Medi	197	-	7	-	-
	58. Luhari	22	-	-	11	0
	59. Porkola	39	-	-	13	0
	60. Amari	21	-	-	11	0
	61 Mahad	43	-	-	7	0
	62 Khokhara	17	-	-	10	0
	63 Jher	43	-	-	15	0
	64 Dia	8	-	-	7	0
	65 Dotar	34	-	-	8	0
	66Bedadar	18	-	-	14	0
	67 Kharavani	12	-	-	5	0
	68 Ashwara	24	-	-	18	0
	69 Sura	15	-	-	16	0
	70 Amlia	6	-	-	9	0
	71 Manasi	6	-	-	16	0
	72 Dhanodar	70	20	41	-	0
	73 Gura	15	8	6	-	0

Kotra	74 Maldar kala	16	2	16	-	0
	75 Maldar Khurd	7	9	-	-	0
	76 Digavari kala	154	47	44	-	0
	77 Digavari khurd	79	26	28	-	0
	78 Kausa	116	23	16	-	0
	79 Padalwara	107	13	9	-	0
	80 Kana padar	42	-	5	4	0
	Total	**3096**	**1126**	**948**		
Jhadol	81 Jetuwara	33	-	-	14	0
	82 Hirumal	17	4	-	3	0
	83 Kunda	15	4	-	3	0
	84 Gamaru	21	12	8	2	0
	85 Bitta	9	-	5	2	0
	86 Birothi	35	-	20	28	0
	87 Nayagaon	28	-	31	12	0
	88 Bhakumba	17	-	21	6	0
	89 Newaj	34	29	26	6	0
	90 Kunda	5	2	2	2	0
	91 Dovi	23	-	17	4	0
	92 Adkaliya	28	37	45	8	0
	93 Nal nanama	20	-	15	6	0
	94 Gudli	11	5	13	23	0
	95 Rohimal	55	26	15	75	0
	96 Basiwara	44	20	28	69	0
	97 Daiyya	58	53	34	3	0
	98 Ambasa	69	82	46	26	0
	99 Mal	7	-	17	-	0
	100 Vahighatia	42	-	11	3	0
	101 Kavel	30	18	-	-	0
	102 Bujha	42	21	11	3	0
	103 Sandavasa	39	8	2	7	0
	104 Sundala	9	-	3	-	0
	105 Chhali Bokara	8	-	5	-	0
	106 Sarwan	29	9	15	30	0
	107 Lathuni	25	17	70	-	0
	108 Tinduri	23	15	10	21	0
	109 Ambavi	8	14	2	17	0
	110 Amlia	6	-	-	-	0
	111 Puipalwara	41	-	50	-	0
	112 Kodar	56	-	20	-	0
	113 Umaria	31	-	9	-	0
	114 Gura	27	18	2	3	0

Jhadol	115 Burawara	18	8	2	3	0
	116 Ada Haldu	4	1	6	-	0
	117 Bhoiwara	14	4	2	-	0
	118 Bhagorawas	18	16	1	-	0
	119 Bhesana	11	5	38	-	0
	120 Parmar	22	3	2	2	0
	121 Kot	40	10	6	-	0
	122 Mandawa	21	-	3	-	0
	123 Dharwan	3	4	5	6	7
	124 Amda	113	37	5	2	0
	125 Panarwa	27	49	29	-	0
	126 Kahjurna	34	8	50	6	0
	127 Anjroli Dolji	16	7	8	8	0
	128 Anjroli kala	50	27	3	8	0
	129 Surimala	9	7	2	-	0
	130 Komaria	16	7	8	-	0
	131 Babarebara	17	-	10	-	0
	132 Anjroli-Khas	4	1	-	-	0
	133 Dolaria	19	-	-	5	0
	134 Dolaria	11	8	21	5	0
	134 Dolaria	40	21	9	6	0
	Total	**1449**	**613**	**762**		
	Grand Total	**4542**	**1739**	**1710**		

Main Crops (1) Kharif - Maize, Toor, Paddy, Tuberous Crops like Zinzer, colocacia etc.
(2) Rabi Crop - Wheat, Mustard, Barley, Gram

(B) LAND USE PATTERN OF THE VILLAGES AROUND THE SENCTUARY (UPTO 10 KM)

Tehsil	Village	Agriculture Hect.	pasture Hect.	Wastland Hect.	No. of Pultary	
					Wells	Ponds
1	2	3	4	5	6	7
Kotra	1. Kotra	54	-	9	36	0
	2. Gadhisarna	118	-	10	36	0
	3. Nichli subri	146	121	10	47	0
	4. UpliSubri	55	-	3	32	0
	5. B harod	11	7	7	9	0
	6. Badla	17	16	2	5	0
	7. Lamba-Haldu	13	22	25	9	0
	8. NichlaThala	13	20	8	-	0
	9. Bhuri - Debar	32	-	9	18	0

	10. Luna	18	7	-	6	0
Kotra	11. Jogibad	396	88	30	-	0
	12. Juda	50	41	2	4	0
	13. Siyara	76	-	27	6	0
	14. Tadala	35	21	3	-	0
	15. Junipadar	27	-	44	-	0
	16. Punavali	8	-	7	-	0
	17. NichliKundal	23	19	13	-	0
	18.Upli kundal	23	19	13	-	0
	19. Kantharia	31	-	-	-	0
	20. Nayar	23	-	30	-	0
	21. Umari-padar	35	1	47	-	0
	22. Dadmiya	30	-	7	-	0
	23. Bhulagi-Amli	52	5	5	-	0
	24. Togna	6	16	3	-	0
	Total	**1274**	**394**	**307**		
Jhadol	25. Gejvi	-	-	-	20	0
	26. Kitavaton ka vas	39	20	-	11	0
	27. Ajaipura	25	7	-	10	0
	28. Ranpur	37	24	10	5	0
	29. Kunda	83	21	-	11	0
	30. Bagali	19	9	-	4	0
	31. Sadmari	13	5	-	4	0
	32. Javagia	13	2	-	6	0
	33. Bhemaria	12	6	-	5	0
	34. Kakga (pilak)	3	-	-	1	0
	35. Doli	7	1	-	1	0
	36. Kavaraya	23	20	-	11	0
	37. Dimari	30	11	-	7	0
	38. Adaval	27	14	12	8	0
	39. Auda	84	-	80	82	0
	40. Saverali	12	4	5	9	0
	41. Sahiwara	30	10	11	2	0
	42. Kiliya khari	44	13	25	23	0
	43. Dalela	11	8	12	23	0
	44. Parda	11	3	60	-	0
	45. Amada	29	22	6	-	0
	46. Bala	20	-	22	9	0
	47. Karda	15	-	6	2	0
	48. Adalakara	13	7	6	2	0
	49. Amlata	20	23	5	6	0

	50. Garanvas	101	70	14	18	0
	51. Som	53	-	50	-	0
Jhadol	52. Karel	49	62	53	5	0
	53. Jamti	43	32	50	3	0
	Total	**961**	**401**	**443**		
	Grand Total	**2235**	**795**	**750**		

Main crops : (1) Kharif : Maize, Toor, Paddy, Tuberous crops like zinzer, colocasia etc

(2) Rabi : wheat, Mustard, Barley gram

ANNEXURE - 28

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF VILLAGE WITHIN THE BOUNDARY AND EXISTING INFRASTRUCTURE FECILITIES

District	Tehsil	Village	Population				Infrastructure fecilities available *
			S.C.	S.T.	Others	Total	
Udaipur	Kotra	01 Dhedmariya	-	653	17	670	PS, W, HP, R, E
		02 Gura	-	554	14	568	PS, W, HP, R, E
		03 Amliya	-	48	42	90	PS, W, HP,
		04 Palesar	20	422	5	447	PS, W, HP,
		05 Bilvan	-	673	7	680	PS, W, HP, E
		06 Sarli	-	179	-	179	PS, W, HP,
		07 Khajuria	-	99	-	99	PS, W, HP,
		08 Sakma ji mata	-	-	-	-	PS, W, HP,
		09 Upla Thala	-	269	-	269	PS, W, HP,
		10 Thodimal	-	-	-	-	PS, W, HP,
		11 Ariwara	-	130	16	146	PS, W, HP,
		12 Patharpari	-	803	13	816	PS, W, HP,R, E
		13 Nal Digavari	-	42	-	42	PS, W, HP,
		14 Saktalia	-	11	-	11	PS, W, HP,
		15 Chamunda Mahua	-	16	-	16	PS, W, HP,
		16 Badli	-	528	216	744	PS, W, HP,
		17 Umaria	-	271	10	281	PS, W, HP,
		18 Poptali	-	140	-	140	PS, W, HP,
		19 Sisvia	-	232	4	236	PS, W, HP,
		20 Amba Deh	-	399	22	421	PS, W, HP,
		21 Gaupipla	-	1034	43	1077	MS, W, HP, R, E
		22 Dungaria	-	288	49	337	PS, W, HP, R, E

		23 Chauri Magari	-	120	1	121	PS, W, HP,
		24 Arjunpura	-	105	-	105	PS, W, HP, R, E
		25 Chauki	-	82	-	82	PS, W, HP, R
		26 Kanjuva	-	96	1	97	PS, W, HP,
		27 Vali	-	154	-	154	PS, W, HP,
		28 Godalwara	-	179	2	181	PS, W, HP,
		29 Khakhariya	-	216	1	217	PS, W, HP,
		30 Kundal	-	340	4	344	PS, W, HP,
		31 Kansan	-	84	-	84	PS, W, HP,
		32 Talab	-	305	5	310	PS, W, HP,
		33 Mafari	-	1804	95	1899	PS, W, HP,
		34 Bordi Kala	-	182	-	182	PS, W, HP,
Udaipur	Kotra	35 Bordi Khurd	-	182	-	182	PS, W, HP,
		36 Nal	-	858	-	585	PS, W, HP,
		37 Sara	12	1501	-	1513	MS, W, HP, R, E
		38 Luk	-	600	2	602	PS, W, HP, R, E
		39 Rajpura	-	429	5	434	PS, W, HP,
		40 Bali karni	-	374	-	374	PS, W, HP,
		41 Savankyara	19	685	3	707	PS, W, HP,
		42 Sikla	-	268	1	269	PS, W, HP, R, E
		43 Gura	57	834	13	984	PS, W, HP, R, E
		44 Goramari	-	338	4	342	PS, W, HP,
		45 Meri	-	511	55	566	PS, W, HP,
		46 Koldara	33	110	-	143	PS, W, HP,
		47 Hasreta	-	191	4	195	PS, W, HP,
		48 Nakola	-	286	10	296	PS, W, HP,
		49 Sandol	-	115	33	148	PS, W, HP,
		50 Vav viran	-	13	-	13	PS, W, HP,

		51 Man daval	-	988	5	993	PS, W, HP,
		52 Seri	-	90	-	90	PS, W, HP,
		53 Sekli	-	395	-	395	PS, W, HP, R
		54 Budiya	6	923	3	932	PS, W, HP,
		55 Vasela	2	439	10	451	PS, W, HP, R
		56 Dairi	1	519	20	540	PS, W, HP,
		57 Medi	1	1414	124	1539	PS, W, HP,
		58. Luhari	-	181	28	209	PS, W, HP,
		59. Porkola	-	490	9	499	PS, W, HP,
		60. Amari	3	214	-	217	PS, W, HP,
		61 Mahad	13	565	87	655	MS, W, HP, R, E
		62 Khokhara	-	284	2	286	PS, W, HP,
		63 Jher	-	564	52	616	PS, W, HP,
		64 Dia	-	84	-	84	PS, W, HP,
		65 Dotar	-	279	43	322	PS, W, HP,
		66Bedadar	-	212	27	239	PS, W, HP,
		67 Kharavani	-	110	11	121	PS, W, HP,
		68 Ashwara	-	160	11	171	PS, W, HP,
		69 Sura	-	128	66	194	PS, W, HP,
		70 Amlia	-	56	9	65	PS, W, HP,
		71 Manasi	-	121	20	141	PS, W, HP,
		72 Dhanodar	-	251	67	318	PS, W, HP,
		73 Gura	-	52	-	52	PS, W, HP,
		74 Maldar kala	-	97	14	111	PS, W, HP,
		75 Maldar Khurd	-	41	50	91	PS, W, HP,
		76 Digavari kala	-	397	26	423	PS, W, HP,
		77 Digavari khurd	-	253	-	253	PS, W, HP,
Udaipur	Kotra	78 Kausa	5	420	-	425	PS, W, HP,
		79 Padalwara	-	245	10	255	PS, W, HP,
		80 Kana padar	-	149	-	149	PS, W, HP,
		Total	**17**	**28179**	**139**	**2974**	

			2		2	3	
Udaipur	Jhadol	81 Jetuwara	-	223	-	223	PS, W, HP, R, E
		82 Hirumal	-	9	82	91	PS, W, HP,
		83 Kunda	-	75	4	79	PS, W, HP,
		84 Gamari	-	114	151	265	PS, W, HP,
		85 Bitta	-	114	-	114	PS, W, HP,
		86 Birothi	99	78	537	714	HS, W, HP, R,E
		87 Nayagaon	47	391	57	495	PS, W, HP, E
		88 Bhakumba	8	218	-	226	PS, W, HP,E
		89 Newaj	-	301	214	515	PS, W, HP, E
		90 Kunda	-	39	-	39	PS, W, HP,
		91 Dovi	114	-	115	229	PS, W, HP,
		92 Adkaliya	-	419	132	551	PS, W, HP,
		93 Nal nanama	-	314	-	314	PS, W, HP,
		94 Gudli	-	-	111	111	PS, W, HP,
		95 Rohimal	15	17	108	140	PS, W, HP, E
		96 Basiwara	24	60	363	447	PS, W, HP,
		97 Daiyya	55	485	23	563	PS, W, HP, E
		98 Ambasa	14	973	371	1358	PS, W, HP, R,E
		99 Mal	6	166	20	192	PS, W,
		100 Vahighatia	4	580	2	586	PS, W, HP,
		101 Kavel	-	256	198	454	PS, W, HP, E
		102 Bujha	19	354	48	421	PS, W, HP,
		103 Sandavasa	-	124	10	134	PS, W, HP,
		104 Sundala	-	235	-	235	PS, W, HP,
		105 Chhali Bokara	-	242	3	245	PS, W, HP,
		106 Sarwan	-	124	84	208	PS, W,
		107 Lathuni	-	532	-	532	PS, W, HP, R,E
		108 Tinduri	-	305	28	333	PS, W, HP, E
		109 Ambavi	-	314	143	457	PS, W, HP, E
		110 Amlia	-	158	11	169	PS, W, HP,

		111 Puipalwara	18	1020	-	1038	PS, W, HP,
		112 Kodar	-	842	-	842	PS, W, HP,
		113 Umaria	-	333	-	333	PS, W, HP,
		114 Gura	185	222	-	407	PS, W, HP,
		115 Burawara	-	120	53	173	PS, W, HP,
		116 Ada Haldu	-	190	-	190	PS, W, HP,
		117 Bhoiwara	-	113	-	113	PS, W, HP,
		118 Bhagorawas	-	215	-	215	PS, W, HP,
		119 Bhesana	6	335	-	341	PS, W, HP,
		120 Parmar	-	278	-	278	PS, W, HP,
Udaipur	Kotra	121 Kot	-	415	-	415	PS, W, HP,
		122 Mandawa	-	300	-	300	PS, W, HP,
		123 Dharwan	8	843	-	851	PS, W, HP, R, E
		124 Amda	-	1040	-	1040	PS, W, HP, R, E
		125 Panarwa	80	360	46	486	PS, W, HP, R, E
		126 Kahjurna	-	109	-	109	PS, W, HP,
		127 Anjroli Dolji	50	25	11	86	PS, W, HP, E
		128 Anjroli kala	-	68	184	252	PS, W, HP, E
		129 Surimala	-	65	65	130	PS, W, HP,
		130 Komaria	-	23	-	23	PS, W, HP,
		131 Babarebara	-	249	-	249	PS, W, HP,
		132 Anjroli-Khas	-	171	-	171	PS, W, HP,
		133 Dolaria	-	396	-	396	PS, W, HP,
		Total	**755**	**15057**	**3468**	**19280**	
		Grand Total	**92**	**43236**	**486**	**4902**	

			7		**0**	**3**	

* PS= Primary School, MS= Middle School, HS=Higher /Sr.Sec. School, H=Hospital, W=Well, HP=Hand Pump, R=Pucca Road, E= Electricity

ANNEXURE - 29

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF VILLAGES WITHIN 10 KM FROM THE BOUNDARY OFSANCTUARY AND EXISTING INFRASTRUCTURE

District	**Tehsil**	**Village**	**S.C.**	**S.T.**	**Others**	**Total**	Infrastructure fecilities available*
1	2	3	4	5	6	7	8
Udaipur	Kotra	01 Kotra	128	698	1977	2803	HS,W,HP,R,E,H
		02 Gadhisarna	-	883	-	883	PS,W,HP,
		03 Nichli Subri	-	837	-	837	PS, W, HP,
		04. UpliSubri	-	499	6	505	PS, W, HP,
		05. Bharod	-	81	-	81	PS, W, HP,
		06. Balda	-	137	7	144	PS, W, HP,
		07. LambaHaldu	-	310	-	310	PS, W, HP,
		08. NichlaThala	-	235	1	236	PS, W, HP,
		09. Bhuri Debar	-	239	-	239	PS, W, HP,R,E
		10. Luna	-	138	-	138	PS, W, HP,
		11. Jogibad	-	1307	74	1381	PS, W, HP,R,E
		12. Juda	121	72	500	693	MS, W, HP, R, E
		13. Siyara	-	259	1	260	PS, W, HP,
		14. Todala	-	150	-	150	PS, W, HP,
		15. Junipadar	-	309	-	309	PS, W, HP,
		16. Punavali	-	38	12	50	PS, W, HP,
		17. NichliKundal	-	154	2	156	PS, W, HP,

		18. UpliKundal	-	194	11	205	PS, W, HP,
		19. Kantharia	-	61	-	61	PS, W, HP,
		20. Nayar	-	161	-	161	PS, W, HP,
		21. Umari - Padar	-	192	39	231	PS, W, HP,
		22. Dadmiya	-	208	94	302	PS, W, HP,
		23. BhulariAmli	-	297	-	297	PS, W, HP,
		24. Torna	1	526	77	604	PS, W, HP,
		Total	**250**	**7985**	**2801**	**11036**	
Udaipur	Jhadol	25 Gejvi	-	516	13	529	PS, W, HP, R, E
		26. Kitavton ka vas	-	312	72	384	PS, W, HP,
		27. Ajaipura	-	128	70	198	PS, W, HP,
		28. Ranpur	-	396	-	396	PS, W, HP, E
		29. Kunda	-	629	-	629	PS, W, HP,
		30. Bagali	-	105	36	414	PS, W, HP,
		31. Sadmari	-	21	59	80	PS, W, HP,
		32. Javariya	-	34	-	34	PS, W, HP,
		33. Bhemariya	-	191	-	191	PS, W, HP,
		34. Kakua (Pilak)	-	89	-	89	PS, W, HP,
		35. Doli	-	23	-	23	PS, W, HP,
		36. Kavaraya	-	220	4	224	PS, W, HP,
		37. Dimari	-	135	56	191	PS, W, HP,
		38. Ataval	10	13	123	239	PS, W, HP,
		39. Auda	75	121	846	1024	PS, W, HP,
		40. Savgali	-	-	103	103	PS, W, HP,

		41. Sahiwara	2	84	143	229	PS, W, HP,
		42. Koliya khari	-	15	242	257	PS, W, HP,
		43. Dalela	-	-	95	95	PS, W, HP,
		44 Parda	-	60	-	60	PS, W, HP,
		45 Amda	11	112	135	258	PS, W, HP, R, E
		46 Bala	-	668	-	668	PS, W, HP,
		47 Karda	-	136	-	136	PS, W, HP,
		48 Adalakara	-	192	-	192	PS, W, HP,
		49 Amalata	-	236	-	236	PS, W, HP,
		50 Garanvas	8	1109	17	1134	MS, W, HP, R, E
		51 Som	-	998	46	1044	PS, W, HP, R, E
		52 Karel	32	1089	-	1121	MS, W, HP,R,E
		53 Jamti	-	1098	-	1098	PS, W, HP,
		Total	**138**	**8757**	**2150**	**11045**	
		Grand Total	**388**	**164742**	**4951**	**22081**	

* PS= Primary School, MS= Middle School, HS=Higher /Sr.Sec. School, H=Hospital, W=Well, HP=Hand Pump, R=Pucca Road, E= Electricity

ANNEXURE- 30

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF PLACES OF PILGRIMAGE IN SANCTUARY AREA

(i) Within Sanctuary:

S. No.	Name	Location	Forest Block	Comptt. No.	Catchment of pilgrimage
1.	BhilriMataji	Hukeri, Panarwa	Phulwari	19	upto 25 km radius
2.	BhaderBavji	Dungaria	Develi	10	upto 25 km radius
3.	Leelagarh	Luhari	Phulwari	6	upto 25 km radius
4.	BamniMata	Dhedmariya	Dhedmariya	17	upto 25 km radius

(ii) Outside Sanctuary (at Periphery)

S.No	Name	Location	NearesForest Block	Catchment of pilgrimage
1.	Jain temple Aabhapur (Gujarat)	Near Aabhapur in GujaratState	Daiya	More than 100 km radius
2.	Tum Raj Bavji	Near GuraVillage	Umariya	Upto 30 km radius

ANNEXURE- 31

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF VALID ARM LICENCES

S. No.	Name of person holding fire-arms	Village	Type of weapon
1	Rama S/o Raja Garasia	Mandwa	Single BarelTopidar gun
2	Bagata S/o LalaGarasia	Mandwa	Single BarelTopidar gun
3	Ambia S/o RupajiGarasia	Mandwa	Single BarelTopidar gun
4	Partha S/o Rama Kharadi	Mandwa	DaubleBarelTopidar gun
5	Bhera S/o LalaGamor	Mandwa	Single BarelTopidar gun
6.	Karu S/o KeshaLathumi	Lathuni	Single BarelTopidar gun
7.	Bela S/o MegaGarasia	Mandwa	Single BarelTopidar gun
8.	Lala S/o NathaGamar	Mandwa	Single BarelTopidar gun
9.	Gula S/o LalaGamor	Mandwa	Single Barrel Topidar gun
10.	Badda S/o LaluBhagora	Mandwa	Single Barrel Topidar gun
11.	Bela S/o DevaGarana	Mandwa	Single Barrel Topidar gun
12.	Kana S.o Rama Kharadi	Mandwa	Single Barrel Topidar gun
13.	RoshanLal S/o GamaniLalKothari	Kolyari (Hal - Mandwa)	Single Barrel Topidar gun
14.	Kashu Lal S/o GaneshLal jain	Manpur	Twelve Bore Single Barrel
15.	MaganLal S/o MotiLal	Manpur	Single Barrel Topidar
16.	Rupa S/o Savji	Manuda	Single Barrel Topidar
17.	Mangla S/o BadaBhagara	Mandwa	Single Barrel Topidar
18.	MohanLal S/o KuriLal	Amba	Double Barrel Topidar
19.	Vaisa S/o RatnaConasia	Mandwa	Single Barrel Topidar
20.	RoshanLal S/o GumanLal	Mandwa	Twelve Bore Single
21.	Nagla S/o KarnaSagia	Mandwa	Single Barrel Topidar
22.	Shanker S/o NathajiCaharna	Mandwa	Single Barrel Topidar
23.	Shambhoo S/o Kana	Panarwa	Single Barrel Topidar

24.	Nola S/o NathuNinama	ChhaliBokra	Single BorelTopidar gun
25.	Vesa S/o NathaNinama	Bokra	Single BorelTopidar gun
26.	Nara S/o AsnaChauhan	ChhaliBokra	Single BorelTopidar gun
27.	Balu S/o Sona	Ambasa	Single BorelTopidar gun
28.	HiraLal S/o BanaBhai	Ambasa	Single BorelTopidar gun
29.	Allauddin S/o Sadruddin	Kotra	Single BorelTopidar gun
30.	Ram BahudurSingh S/o ManoharSingh	Panarwa	5 Bore B.B.L.
31.	DungarSingh S/o ManoharSingh	Panarwa	Double BurelTopidar
32.	Ran BahadurSingh S/o ManoharSingh	Panarwa	Topidar
33.	Sh.Manohar Singh S/o MohabbatSingh.	Panarwa	318 Bore S.B.B.L. 12 Bore D.B.B.L.
34.	Sh.Nohallat Singh S/o MohabbatSingh	Panarwa	Topidar
35.	Sh.Nohabbat Singh S/o MohabbatSingh	Panarwa	Single Bore Topidar
36.	Sh.Manohar Singh S/o MohabbatSingh	Panarwa	Double Barrel Biluts.
37.	DungarSingh S/o ManoharSingh	Panarwa	500 Bore D.B.B.L.
38.	Smt. LalitaKunwar W/o Sh.Manohar Singh	Panarwa	410 Bore
39.	BalwantSingh S/o HimmatSingh	Mamer	Single Bore Topidar
40.	HimmatSingh S/o RatanSingh	Mamer	12 Bore (1)
41.	JaipalSingh S/o HimmatSingh	Mamer	405 Bore (1)
42.	NarendraSingh S/o HimmatSingh	Mamer	NIP Bore (1)
43.	BhanwarLal S/o KundanLal	Kesri	12 Bore Single Barrel
44.	Abdul Khan S/oAbdul Aziz Khan	Kotra	Topidar Double Bore
45.	Nizamuddin S/o Vaktaji	Kotra	Bora Bore
46.	AbdulRauk S/o Hizamuddin	Kotra	Topidar
47.	Sina Ram Lohar S/o Chilaji	kotra	Topidar
48.	Sina Ram Lohar S/o Chelaji	Kotra	Topidar Duoble Barrel
49.	AbdulMazuiKhan S/oAbdul Mazid Khan	Kotra	Single Barrel S.B.B.H.

50.	AbdurJabbor S/o Fakrudding	Kotra	Topidar
51.	AsrafAli S/o JohurAli	Kotra	12 Bore
52.	AbdulRahim S/o Imamuddin	Kotra	Topidar Double Barrel
53	AbdulRahnan S/o Immaruddin	Kotra	Topidar Double Barrel
54.	Abdeali S/o MulaumAbbasi	Kotra	12 Bore Single Barrel
55.	JulfikarAli S/o AsfakAli	Kotra	Topidar Sujh Barrel
56.	AsfakAli S/o AbbasAli	Kotra	12 Bore Double Bore
57.	MannuBhai S/o AjmeriBhai	Kotra	Topidar Double Bore
58.	Munabber S/o AjmeriBhai	Kotra	12 Bore Double Bore
59.	Jiyauddin S/o SarfuddingShekh	Kotra	1 Deshi Double Bores 1 Topidar
60.	Mahmud Ali S/o Baser Ali	Kotra	12 Bore Double Bore S.B.B.H.
61.	AshikAli S/o NaserAli.	Kotra	Topidar Double bore
62.	HamidAli S/o NasarAli.	Kotra	Topidar Double bore
63.	Hidatulla Khan S/oTunatulla Khan	Kotra	D.B.B.H. Single Bore
64.	SherdilKhal S/o Akber Khan	Kotra	TopidarDeshi
65.	Raish Khan S/oMustaf Khan	Kotra	12 Bore
66.	Nizamuddin S/o Alauddin	Kotra	Topidar
67.	Samla S/o SazaKher	PhuldariaKotra	Topidar
68.	Joria S/o MomaGamati	PhuldariaKotra	Topidar
69.	Nania S/o PakujiZahur	Intalia	Topidar
70.	Raichandra S/o HonaKher	Phulduria	Topidar
71.	MustakAhmad S/o Ahmadji	Phulduria	Topidar
72.	Abdul Hakim S/o AbdulSakur	Kotra	12 Bore S.B.B.H.
73.	Ismanuddin S/o Gulamuddin	Kotra	Topidar
74.	MaganLalSoni S/o Bane Chand	Kotra	Topidar
75.	Rama S/o Bhera	Dungaiehg (Maldar)	Topidar Double Bore
76.	Birma S/o KalaChauhan	Upli maldar	Topidar Double Bore
77.	Chatra S/o HeemajiGarasia	KereenPanarwa	Topidar Single Bore
78	Nasruddin S/o AjmeriBhai	Kotra	12 Bore Double bore
79.	Sirajudding S/o Alauddin	Kotra	Topidar Single Bore
80.	Jalu S/o GaluDamor	Kandi	Topidar Single Bore
81.	AbdulAzizKhan S/oJaman Khan	Kotra	12 Bore D.B.B.L.
82.	Mana S/o RodaGarasia	Kerri	Topidar
83.	Sakim Khan S/oHammid Khan	Kotra	Topidar Double Barrel
84.	Dhula S/o JalmaDavi	Medimamer	TopidarSingh borl
85.	Amia S/o Lalu gameti	Medi maner	Topidar Single Borel

86.	Sona S/o Bhima gameti	Medi	Topidar Single Borel
87.	Moti S/o BhimaDavi	Mendi	Topidar Single Borel
88.	Kira S/o BhimaDavi	Mendi	Topidar Single Borel
89.	Daula S/o UlkhaDavi	Mendi	Topidar Single Borel
90.	Pubuj S/o BhikhaKhokharia	Dehri	Topidar Single Borel
91.	Arjana S/o BehtaPargi	Dehri	Topidar Single Borel
92.	Baheta S/o BelaPargi	Dehri	Topidar Single Borel
93.	Bhama S/o BelaPargi	Dehri	Topidar Single Borel
94.	Mehla S/o KodraPargi	Dehri	Topidar Single Borel
95.	Dhanna S/o JalaPargi	Deri	Topidar Single Borel
96.	HarendraSinghSolanki S/o HimmatSinghSolanki	Mamer	12 Bore Double Bor
97.	Ana S/o Vaja	Dehri	Topidar Single Barrel
98.	Bhima S/o VesaPandor	Buidia	Topidar Single Barrel
99.	Dita S/o AlkhaPandor	Budia	Topidar Single Barrel
100.	Moza S/o BakhtaPandor	Budia	Topidar Single Barrel
101.	Lata S/o LalaPandor	Budia`	Topidar Single Barrel
102.	Lumia S/o Lala Pander	Budia	Topidar Single Barrel
103.	Panne Singh S/o KishorSingh	BalotMamer	12 Bore S.B.B.L.
104.	Madu S/o JogaGameti	Mendi	Topidar Single bore
105	Goma S/o HeeraGameti	Mendi	Topidar Single bore
106.	Kana S/o PoojaGameti	Mendi	Topidar Single Bore
107.	Gujra S/o Jalma	Mendi	Topidar Single Bore
108.	Oda S/o DhannaGarasia	Mandara	Topidar single Bore
109.	Basudev S/o Lalaji Pander	Badia	Topidar Single Barrel
110.	Jahaluddin S/o JanMohammad	Kotra	Topidar Single Barrel
111.	Oda S/o Deva	Digavari	Topidar Single Borel
112.	Baisa Ram S/o PoonajiGarasia	Mandwa	Topidar Single Barrel
113.	Poona S/o HanajiKharadi	Mandwa	Topidar Single Barrel
114.	Moti S/o RatkaPargi	Loona	Topidar Single Barrel
115.	Joga S/o mala Pargi	Mandwal	Topidar Single Barrel
116	Bela S/o Alkha Pander	Budia	Topidar Single Barrel
117.	Bagta S/o ThaworaPargi	GauPipla	Topidar Single Barrel
118.	NawalKishor S/o NathaPargi	GauPipla	Topidar Single Barrel
119.	Kala S/o ChainaBadera	Khanchan	Topidar Single Barrel
120.	Amra S/o KasnaPargi	Khanchan	Topidar Single Barrel
121.	LalSingh S/o PannaSingh	Burahad	Topidar Single Barrel
122	RatanSingh S/o Chain Singh	Suri mala	Topidar Single Barrel
123	Sakra S/o BaduDamor	Amba	Topidar Single Barrel
124	Dharma S/o ThawraBhil	Hundla	Topidar Single Barrel
125	Dharma S/o CulaKharadi	Hundla	Topidar Single Barrel
126	Arjana S/o Moti	Nakola	Topidar Single Barrel

127	Salim Khan S/oAbdul Rajak	Kotra	Topidar Single Barrel
128	Kala S/o DhulaGamar	Nakola	Topidar Single Barrel
129	KachraPandor S/o Jalam	Budra	Topidar Single Barrel
130	JakirHussain S/o Dad Mohammad	Kotra	Topidar Single Barrel
131	MadanSingh S/o LalSingh	Masadi	Topidar Single Barrel
132	Anna S/o OdaDavi	Mahadi	Topidar Single Barrel
133	UdaiSingh S/o RatanSingh	Mahadi	Topidar Single Barrel
134	Kalu S/o Poona Davi	Mahadi	Topidar Single Barrel
135	Deria S/o DhoolaBumbaria	Mahadi	Topidar Single Barrel
136	Hankla S/o BhomaBumbaria	Mahadi	Topidar Single Barrel
137	Lalu S/o SubjiDavi	Mahadi	Topidar Single Barrel
138	Huria S/o SariaBumbaria	Mahadi	Topidar Single Barrel
139	Namia S/o Mitria	Budia	Topidar Single Barrel
140	Deva S/o DheeraDavi	Budia	Topidar Single Barrel
141	Fagna S/o Deva	Budia	Topidar Single Barrel
142	Homa S/o LakhaDavi	Budia	Topidar ingle Borel
143	Bhama S/o KodraPargi	Dehri	Topidar ingle Borel
144	AbdulHafiz S/o Abdulla	Kotra	Topidar ingle Borel
145	Uasa S/o Kesaji	Tendori	Topidar ingle Borel
146	Sona S/o DevaGameti	Hundla	Topidar ingle Borel
147	Roopa S/o PannaDamor	Amba	Topidar ingle Borel
148	Deva S/o PannaGarasia	Amba	Topidar ingle Borel
149	Poona S/o KeshaKhokharia	Hundla	Topidar ingle Borel
150.	Lumba S/o JohaGameti	NayaGara	Topidar ingle Borel
151.	Bada S/o BajaKharudi	NayaGara	Topidar ingle Borel
152.	Lalu S/o KodraKhobra	NayaGara	Topidar ingle Borel
153	Shambhoo S/o NawalSingh	Birothi	Topidar ingle Borel
154.	Bal Singh S/o anlat Singh	Birothi	Topidar ingle Borel
155.	BheruSingh S/o KhoomSingh	Birothi	Topidar ingle Borel
156.	bhema S/o KomaBhil	NayaGaon	Topidar ingle Borel
157	BhooriLal S/o Kanji Gameti	NayaGaon	Topidar ingle Borel
158	Kalu S/o FathalalaBhil	NayaGaon	Topidar ingle Borel
159	KankuLal S/o PoojaBhil	NayaGaon	Topidar ingle Borel
160	MitthaLal S/o DeetajiBhil	Malvia	Topidar ingle Borel
161	Shanker Lal S/o RamLalBhil	NayaGaon	Topidar ingle Borel
162	Jeenat Ram S/o FatehLalBhil	NayaGaon	Topidar ingle Borel
163	Sava S/o KalaKharadi	NayaGaon	Topidar ingle Borel
164	Belchand S/o HarziBhil	NayaGaon	S.B.M. Gun
165	DeevanLal S/o UdaiLalSeth	Birothi	S.B.M. Gun
166	KaluLal S/o KhimajiGarasia	Juddi	Topidar
167	ShambhuSingh Hawal Singh	Birothi	Topidar

168	Thawara S/o Dalal Singh	HayaGaon	S.B.M.T. Gun
169	RoopSingh S/o UdaiSingh	Birothi	Topidar
170	NathuLal S/o DhannajiGameti	Birothi	Topidar
171	FatehLal S/o JoresBhil	NayaGaon	Topidar
172	ManoharSingh S/o Ham Singh	Birothi	Topidar
173	Poona S/o ChatraKhatri	Birothi	Topidar
174	Bheru Singh S/o Guman singh	Birothi	Topidar
175.	Ram Singh S/o RatanSingh	Birothi	Topidar
176.	Poona S/o RoopaGamati	Bujra	Topidar
177.	JeevanSingh S/o KishanSingh	Birothi	Topidar
178.	Gulav Singh S/o Jet singh	Birothi	Topidar
179	Dhanna S/o HeeraDamor	NayaGaon	Topidar
180	KaluLal S/o Kalu Ram Meghwal	Birothi	S.B.M.L. 264
181	Jalam S/o VeermaKharehi	Birothi	Topidar
182.	KesharSingh S/o Amarsingh	Birothi	S.B.M.L. 264
183.	LalSingh S/o Nan Singh	Birothi	S.B.M.L. 9m
184.	BeerumChand S/o Dharma Gamar	Birothi	S.B.M.L. 9m
185.	Nan Singh S/o DeviSingh	Birothi	S.B.M.L. 9m
186.	Bolia S/o Foola Damer	Bhookamha	Topidar
187.	PannaLal S/o BhimaGamar	Bhakumka	Topidar
188.	Sakura S/o BhulaGamar	Nayagaon	Topidar
189.	Badruddin S/o JamaluddinShekha	Baddi	12 Bore S.B.B.L.
190.	Alanoor S/o Nandeshak	Kotra	Topidar
191.	InshwarLal S/o BhanwarlalPurbia	Kotra	Topidar
192.	ManiLal S/o Daula	Butia	Topidar
193.	BhagwatiLal S/o Daula	Butia	Topidar
194.	Bhoja S/o DaulaKagwa	Budia	Topidar
195.	Raja S/o. DaulaKagwa	Budia	Topidar
196.	Gujra S/o HansaKagwa	Budia	Topidar
197.	HarChanda S/o NathaDamor	Budia	Topidar
198.	BhagwatiLal S/o DaulaKagwa	Budia	12 Bore
199.	Ayukhan S/o Hasru Khan	Kotra	12 Bore
200.	LiyakatHussain S/o BadmddimShekh	Badli	12 Bore
201.	Bhera S/o BehtaBumkaria	Mahadi	12 Bore
202.	Jatia S/o BhooraGameti	mamer	12 Bore
203.	DhanSingh S/o BalaSingh	Birothi	12 Bore
204.	Darga S/o BirmaKharadi	NayaGaon	

205	Panna S/o KalaKharadi	NayaGaon	Topidar
206.	Hakra S/o RatnaKhagia	NayaGaon	Topidar
207.	Nan Singh S/o. DhanSingh	Birothi	Topidar
208.	Magla Ram S/o BeermaKharadi	NayaGaon	Topidar
209.	MadhaSingh S/o JeevanSingh	Birothi	Topidar
210.	PoonamChand S/o LalaRamMaghwal	Birothi	Topidar
211	Naran Singh S/o MotriSingh	Alowar	S.B.M.L. Gun
212.	MotiSingh S/o Jag Singh	Birothi	Topidar
213.	Dheera S/o BheraGamar	NayaGaon	Topidar
214.	FatehSingh S/o RatanSinghSolanki	Atwal	Topidar
215.	Kala S/o Nana Gameti	NayaGaon	Topidar

ANNEXURE - 32

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF VETERNARYHOSPITAL IN AND AROUND SANCTUARY

S.No.	Name of VeternaryHospital	Distance from HQ. of Sanctuary	Remark
1	Kotra	0 km	
2	Mamer	25 km	
3	Jhadol	82 km	
4	Saroopganj	50 km	
5	Khedbrahma (Guj.)	50 km	
6	Panarva	27km	

ANNEXURE-33

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF CONCESSION AND RIGHTS OF LOCAL PEOPLE *

S. No.	Forest Block	Area (sq.km.)	Concession	Rights
1	2	3	4	5
1	**Dhedmariya**	**6130**	**Cattle grazing** **Ownership on hide of dead domestic cattle** **Fuelwood by headload for domestic use** **Fencing material** **Wood for agricultural implements** **Grass extraction by headload during winters** **Wood for funeral of dead bodies** **Drinking water for cattle round the year etc.**	**Agriculture on revenue land inside interior line** **Can inhabitant inside land surrounded by interior line** **Can deposit *lagoon* in thesis office** **Can take fruits of Mahuwa, Mango, Imli, Timru etc.** **Can perform worship, *ratri-jagran*, *Parshadi*** **Can use path and tracks** **Can use funeral sites** **Can irrigate crops by tradition methods etc.**
2	**Devali**	**53.40**		
3	**Harwa**	**20.46**		
4	**Phulwari-ki-nal**	**49.10**		
5	**Dharawan**	**24.29**		
6	**Daiya**	**52.68**		
7	**Ambasa**	**60.58**		
8	**Umriya**	**61.82**		
9	**Mamer**	**39.86**		
10	**Asawara**	**40.58**		
11	**Adahaldu**	**47.34**		

* Details of right & concessions and list of villages is available in Block Files.

ANNEXURE- 34

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

CONSTRUCTION OF BUILDING, ROADS, ANICUTS, CAUSE WAY, TALAI

S. No.	Year	RO OFF./RES. Building	New Bridge Samall	New Anicuts	New Causeway	New Gazzalar	Anicuts Repair	Guards Cowki Rep	w F. Guard Chowki	Naka /Barrack Building	Repair of Road	New Ramp wells	Well Repairs	New Talai	Building Reparis
1	**2013-2014**	**-**	**-**	**4**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**1**	**2**
2.	**2014-2015**	**-**	**-**	**3**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**4**	**-**	**1**	**1**
3.	**2015-2016**	**-**	**-**	**2**	**2**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**1**
4.	**2016-2017**	**-**	**-**	**30**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
5.	**2017-2018**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**3**
6.	**2018-2019**	**-**	**-**	**-**	**2**	**-**	**-**	**1**	**1**	**1**	**-**	**1**	**-**	**-**	**2**
7.	**2019-2020**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**2**
8.	**2020-2021**	**1**	**-**	**3**	**-**	**-**	**2**	**1**	**1**	**-**	**2km**	**2**	**-**	**12**	**1**
9.	**2021-2022**	**1**	**-**	**13**	**1**	**-**	**2**	**-**	**-**	**1**	**2km**	**-**	**-**	**94**	**2**
10	**2022-2023**	**-**	**-**	**1**	**-**	**-**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**	**-**
11	**2023-24**			**2**										**1**	
12	**2024-25**			**1**				**6**	**1**					**1**	**9**
TOTAL		3	0	59	11	1	11	10	4	2	4km	11	-	114	25

ANNEXURE-35

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF SURVEY OF INDIA TOPO SHEETS WITH SCALE COVERING MANAGEMENT JURIDICTION

Toposheet No.	Scale
45 H/3	1:50000
45 H/4	1:50000
45 H/7	1:50000
45 H/8	1:50000

LIST OF SURVEY OF INDIA SHEETS WITH SCALE ON WHICH STOCK MAPSARE AVAILABLE

Sheet No.	Scale
45 H/3	1:50000
45 H/4	1:50000
45 H/7	1:50000
45 H/8	1:50000

ANNEXURE - 36

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

LIST OF PLANTATION CARRIED OUT IN THE SANCTUARY AREA

Range	Name of Scheme & model	Area (ha)	Year of establis-hment	Plantation Location	Species	Initial spacin g	Thinn i-ng	Planted No.	Status
Panarva	ANR (CAMPA)	50 Hect.	2014-15	Chokli	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	55 % Plantation is Good
Mamer	ANR (Nabard)	50 Hect.	2015-16	Jher	Bamboo, Ber Khair, Amla, Churel, Siras, Mahuwa	Gape Planting	No	10000	Good
Kotra	ANR (NABARD)	50 Hect	2015-16	Patherpadi	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No.	10000	Good
Panarva	ANR (CAMPA)	50 Hect.	2015-16	Jetiwara	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	60 % Plantation is Good
Jaisamand	ANR (CAMPA)	50 Hect.	2015-16	Chatpur Janana Odhi	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	Good
Panarva	ANR (MJSA)	150 Hect.	2016-17	Bitta, Gamdi, Anjroli	Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal, Karanj, Churel, Karonda, Aamla, Kher	Gape Planting	No	1250	55 % Plants lives
Mamer	ANR (Nabard)	50 Hect.	2017-18	Bordi Ghata	Bamboo, Ber Khair, Amla, Churel, Siras, Mahuwa	Gape Planting	No	10000	Good
Mamer	ANR (CAMPA)	50 Hect.	2021-22	Ghoda Mari	Bamboo, Ber Khair, Amla, Churel, Siras, Mahuwa	Gape Planting	No	10000	Good
Panarva	CA-NFL (CAMPA)	31.30 Hect	2021-22	Sadli	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	5000	98 % Plantation is Good
Panarva	ANR (CAMPA)	50 Hect.	2021-22	Ratanpur	Karanj, Churel, Karonda,	Gape	No	10000	98 % Plantation

					Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Planting			is Good
Panarva	ANR (CAMPA)	50 Hect.	2021-22	Borghati	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Panarva	RDF (NABARD)	50 Hect	2021-22	Marudhara Bujha	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Kotra	ANR (CAMPA)	50 Hect	2021-22	Kadva Mahua	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No.	10000	Good
Jaisamand	ANR (CAMPA)	50 Hect	2021-22	Khana Khedi	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No.	10000	Good
Jaisamand	ANR (CAMPA)	50 Hect	2021-22	Nandvi	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No.	10000	Good
Jaisamand	ANR (CAMPA)	50 Hect	2021-22	Sura Vala Nala	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No.	10000	Good
Jaisamand	ANR (NABARD)	50 Hect	2021-22	Ghatod	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No.	10000	Good
Mamer	ANR (CAMPA)	50 Hect	2021-22	Ghoda Mari	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	Good
Jaisamand	ANR (CAMPA)	50 Hect	2022-23	Nala Fala Dheemra Fatak-I	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	Good
Jaisamand	ANR (CAMPA)	50 Hect	2022-23	Nala Fala Dheemra Fatak-II	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	Good
Jaisamand	ANR (CAMPA)	50 Hect	2022-23	Hanuman Closure Mahudi-I	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	Good
Jaisamand	ANR (CAMPA)	50 Hect	2022-23	Hanuman	Karanj, Churel, Karonda,	Gape	No	10000	Good

				Closure Mahudi-I	Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Planting			
Sajjangarh (Baghdarrah)	ANR (CAMPA)	50 Hect	2022-23	Magzine Gate Baghdararh	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	Good
Mamer	RDF (State Plan)	50 Hect.	2022-23	Medi	Broad Leaves	Gape Planting	No	10000	Good
Panarva	ANR (CAMPA)	50 Hect	2022-23	Lathuni	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Panarva	RDF-II (STATE PLAN)	50 Hect.	2022-23	Ambawala Khadra Bhakumba	Kher, Baheda, Bamboo, Jamun, Bher	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	RDF-II (STATE PLAN)	50 Hect.	2022-23	Iyamata Gamdi	Kher, Baheda, Bamboo, Jamun, Bher	Gape Planting	No	10000	98 % Plantation is Good
Panarva	RDF-II (STATE PLAN)	50 Hect.	2022-23	Bhurad	Kher, Baheda, Bamboo, Jamun, Bher	Gape Planting	No	10000	98 % Plantation is Good
Panarva	RDF-I (NABARD)	50 Hect	2022-23	Anjroli	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	25000	98 % Plantation is Good
Kotra	RDF-II (STATE PLAN)	50 Hect	2022-23	Thala	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No.	10000	Good
Jaisamand	ANR (CAMPA)	50 Hect	2023-24	Nandvi	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Kotra	ANR (CAMPA)	50 Hect	2023-24	Maldar Kala	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Kotra	RDF-I (NABARD)	50 Hect	2023-24	Patherpadi Dholakeu	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	25000	98 % Plantation is Good
Panarva	RDF-I (NABARD)	50 Hect	2023-24	Khajurna Amda	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	25000	98 % Plantation is Good

Sajjangarh	RDF-I (NABARD)	50 Hect	2023-24	Navli	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	25000	98 % Plantation is Good
Jaisamand	RDF-II (NABARD)	50 Hect	2023-24	Chatpur	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Panarva	RDF-II (NABARD)	50 Hect	2023-24	Kherad	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Kotra	ANR (NABARD)	50 Hect	2023-24	Gujrai--I	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Kotra	ANR (NABARD)	50 Hect	2023-24	Gujrai--II	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	ANR (NABARD)	50 Hect	2023-24	Satimata	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	ANR (NABARD)	50 Hect	2023-24	Kajdeshwar	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	ANR (NABARD)	50 Hect	2023-24	Amlidarrah	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Mamer	ANR (NABARD)	50 Hect	2023-24	Jher	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Mamer	ANR (NABARD)	50 Hect	2023-24	Nakola	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Panarva	ANR (NABARD)	50 Hect	2023-24	Lathuni Jher	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Panarva	ANR (NABARD)	50 Hect	2023-24	Jhudli Birothi	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good

Sajjangarh	ANR (NABARD)	50 Hect	2023-24	Baghdarrah	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Kotra	RDF-II (STATE PLAN)	50 Hect	2023-24	Fuldariya	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	RDF-II (STATE PLAN)	50 Hect	2023-24	Shitla Mata	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Mamer	RDF-II (STATE PLAN)	50 Hect	2023-24	Bedhadhar	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Mamer	ANR (CAMPA)	50 Hect	2024-25	Mahad	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Mamer	ANR (CAMPA)	50 Hect	2024-25	Morchucha	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Kotra	ANR (CAMPA)	50 Hect	2024-25	Arjunpura	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Panarva	ANR (CAMPA)	50 Hect	2024-25	Fulwadi	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	ANR (CAMPA)	50 Hect	2024-25	Piladar	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	ANR (CAMPA)	50 Hect	2024-25	Bharav Talab	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	ANR (CAMPA)	50 Hect	2024-25	Mahiya Fatak	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Panarva	ANR (CAMPA)	50 Hect	2024-25	Birothi	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good

Panarva	ANR (CAMPA)	50 Hect	2024-25	Ambasa	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	RDF-II (STATE PLAN)	50 Hect	2024-25	Umriya Card	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	RDF-II (STATE PLAN)	50 Hect	2024-25	Nageshwar Mahadev	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	RDF-II (STATE PLAN)	50 Hect	2024-25	Retguriya	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	RDF-II (STATE PLAN)	50 Hect	2024-25	Ghatod-II	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Jaisamand	RDF-II (STATE PLAN)	50 Hect	2024-25	Dangal Audhi	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Mamer	RDF-II (STATE PLAN)	50 Hect	2024-25	Mahadi Ki nal	Hawan, Bamboo, Neem, Aavla, Siras, Churel, Khirni, Jamun, Baheda, Guda, Mahua	Gape Planting	No	10000	98 % Plantation is Good
Kotra	RDF-II (STATE PLAN)	50 Hect	2024-25	Fuldariya-II	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good
Panarva	RDF-II (STATE PLAN)	50 Hect	2024-25	Bobrawara Bheshana	Karanj, Churel, Karonda, Aamla, Kher, Baheda, Bamboo, Jamun, Bher, Lasoda, Sitafal	Gape Planting	No	10000	98 % Plantation is Good

ANNEXURE - 37

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF SENSITIVE AREA WITH LOCATION BY COMPARTMENTS

S. No.	Name of Sensitive area	Name of forest block	Compartm-ent No.	Remarks Causes of Sensitiven-ess	Remarks
1	Grazing – **Madarl, Phuldariya, Dhedmariya, Thala, Champa Khet, Umriya, Poptali, Chowki, Khanchan, Amba, Lohari, Manasi, Sura, Kharawani, Bedadhar, Adahldu, Vav, Bhim Talai, Asawara, Daiya, Diya, Jher, Bokda, Chhali, Mal, sarwan, Sishviya, Sawan Kyara, Hakarwa, Janiwas, Mahad, Mahari, Ambasa, Patharpadi, Birothi, Panarwa, Kawel, Dharawan, Nalwa, Lathuni, Tinduri, Ambavi, Godalwara, Antaliya, Ariwara, Digawari, Gura, Arjunpura, Dungariya, Jurli, Gamdi, Sarli, Kupra,**	**Dhedmariya, Harwa, Devli, Phulwari-ki-nal, Umriya, Mamer, Asawara, Adahaldu, Daiya, Ambasa, Dharawan,**	**In Whole Block**	**Grazing and Lopping**	
2.	Encroachment - **Madarl, Phuldariya, Dhedmariya, Thala, Champa Khet, Umriya, Poptali, Chowki, Khanchan, Amba, Lohari, Manasi, Sura, Kharawani, Bedadhar, Adahldu, Vav, Bhim Talai, Asawara, Daiya, Diya, Jher, Bokda, Chhali, Mal, sarwan, Sishviya, Sawan Kyara, Hakarwa, Janiwas, Mahad, Mahari, Ambasa, Patharpadi, Birothi, Panarwa, Kawel, Dharawan, Nalwa, Lathuni, Tinduri,**	**Dhedmariya, Harwa, Devli, Phulwari-ki-nal, Umriya, Mamer, Asawara, Adahaldu, Daiya, Ambasa, Dharawan,**	**Whole block**	**Encroachment**	

	Ambavi, Godalwara, Antaliya, Ariwara, Digawari, Gura, Arjunpura, Dungariya, Jurli, Gamdi, Sarli, Kupra,				
3.	Fire -**Maldar, Phuldariya, Dhedmariya, Thala, Champa Khet, Umriya, Poptali, Chowki, Khanchan, Amba, Lohari, Manasi, Sura, Kharawani, Bedadhar, Adahldu, Vav, Bhim Talai, Asawara, Daiya, Diya, Jher, Bokda, Chhali, Mal, sarwan, Sishviya, Sawan Kyara, Hakarwa, Janiwas, Mahad, Mahari, Ambasa, Patharpadi, Birothi, Panarwa, Kawel, Dharawan, Nalwa, Lathuni, Tinduri, Ambavi, Godalwara, Antaliya, Ariwara, Digawari, Gura, Arjunpura, Dungariya, Jurli, Gamdi, Sarli, Kupra,**	**Dhedmariya, Harwa, Devli, Phulwari-ki-nal, Umriya, Mamer, Asawara, Adahaldu, Daiya, Ambasa, Dharawan,**	**Whole block**	**Fire hazard**	
4.	Poaching – **Panarwa, Birothi, Thala, Dhedmariya, Mamer, Mahadi, Mahad, Umriya, Kotra,**	**Dhedmariya, Harwa, Devli, Phulwari-ki-nal, Umriya, Mamer, Asawara, Adahaldu, Daiya, Ambasa, Dharawan,**	**Whole block**	**Poaching**	

ANNEXURE – 38

PHULWARI WILD LIFE SANCTUARY, RAJASTHAN

DETAILS OF ILLEGAL HUNTING OF WILD ANIMALS INCLUDING POISSNING CASES

Year	Range	FIR No. & date	Animal hunted	No. of animal hunted	Schedul	Remark
2003	Kotra	135/82/2.3.2003	Grey Jungle Fowl	1		
2004	-	-	-	-	-	-
2005	-	-	-	-	-	-
2006	Kotra	163/05/14.01.2006	Hynae	1	--	-
2007	-	-	-	-	-	-
2008	Panarwa	172/85/21.12.2008	Peafowl	1	-	-
2009	-	-	-	-	-	-
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-

Note:- from 2009 to 2025 details of illigal hunting of wildlife animals including poissing cases is nill.

ANNEXURE - 39

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF FIRELINES AND ANNUAL FIRES

(A) LIST OF FIRELINES

S.No	Location	Lenght in Km.	Width	Remarks
1	Dolaria to Jetiwara	10	10 Mtr.	-
2	Jher to Dharawan	10	10 Mtr.	-
3	Mandwa to Bordi Nal	10	10 Mtr.	-
4	Mandwa to Aadha Haldu	4	10 Mtr.	-
5	Mandwa to Aadha Haldu	3.8	8.30 Mtr.	
6	Mandwa to Aadha Haldu	7	10 Mtr.	
7	Dharavan to Jher	10	10 Mtr.	-
8	Dharavan to Jher	4	10 Mtr.	
9	Mandwa to Aadha Haldu	4	10 Mtr.	
10	Jher to Dharawan	10	10 Mtr.	
11	Tindori to Bhagagarh	7	8.6 Mtr.	-
12	Ratanpur to Ambasa	10	10 Mtr.	-
13	Jher to Mandwa	6	4 Mtr.	-
14	Tinodi to Ambavi	3	5 Mtr.	-
15	Ambavi to Patwel	3	5 Mtr.	-
16	Mandwa to Aadha Haldu	3.018	5 Mtr.	
17	Jamukar Mata to Khariberi	3	5 Mtr.	-
18	Mata Ghati to God	10	10 Mtr.	-
19	Maldar to Dolriya	10	10 Mtr.	-
20	Dungariya to Thala	10	10 Mtr.	-
21	Bhader Bavji to Surajpol	10	10 Mtr.	-
22	Khanchan to Lohari	10	10 Mtr.	-
23	Lohari to Sona Ghati	10	10 Mtr.	-
24	Medi to Morchucha	6	10 Mtr.	
25	Medi to Morchucha	6	10 Mtr.	
26	Bordi Kala to Koldarrah	10	10 Mtr.	-
27	Koldarah to Janivas	10	9 Mtr	-
28	Morchucha to Medi	5	10 Mtr.	
29	Jher to Mathasi	5	10 Mtr.	
30	Khai Naka to Bhim Talai	5	10 Mtr.	
31	Khai Naka to Bhim Talai	4.50	10 Mtr.	
32	Koldarah to Janivas	3	6 Mtr.	
33	Vav Viran to Dhiya	10	10 Mtr.	
34	Vav Viran to Dhiya	6	6 Mtr.	
35	Kokhra to Bedhadhar	5	6 Mtr.	

36	Koldarrah to Bhimtalai	5	6 Mtr.	
37	Janivas to Sura	5	6 Mtr.	
38	Him ki Mahudi to Bhimtalai	5	6 Mtr.	

(B) LIST OF FIRE WATCH TOWER (EXISTING)

S.No	**Name of watch Tower**	**Location**	**Type**
1.	Nalwa	Som Ghata	Watch Tower

(C) LIST OF FIRE WATCH TOWER (PROPOSED)

S.No	**Name of watch Tower**	**Location**	**Type**
1.	Jher	Jher	Watch Tower
2.	Bhim talai	Bhim Talai	Watch Tower

ANNEXURE - 40

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF ENCROACHMENTS

S. No.	No. of encroachment cases registered	Diposal of cases / sent for approval	Disallowed by committee	sent status of Disallowed cases
1	242	83	01	159
2	668	209	-	459
3	694	137	01	557
4	1604	429	02	1175

ANNEXURE - 41

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

VERTEBRATE SPECIES, THEIR HABITAT ORIENTATION INCLUDING THE MICRO HABITAT ELEMENTS

S. No	Special group	Macro habitate	Microhabitat
1.	Four-houred Antelope	Dense forests	Grassy patches inside dense forest
2.	Leopard	DenseForest and outskirts of forests	Near villages, area full of out crops and crags
3.	Common Langur	Semi-dense forest area	Green area of foothills, road sides
4.	Striped Hyena	Dense forest	Undulating terrain full of Nallahs
5.	Jugle Cat	Outskirts of forests	Open scrubs, agriculture fields, grassy areas dotted with shrubs and trees.
6.	Indian Pangolin	Foot hill forests	Area has deep soil and full of termite hills.
7.	Indian fox	Open areas within forest	Near human habitations, open fields
8.	Common Mangoose	Open areas within forest	Losse stone fencing walls
9.	Ruddy Mongoose	Denser forest pockets	Along revrine strip of vegetation
10.	Sloth Bear	Dense forests	Nallah full of Ficus glomerata, Temru trees
11.	India Hare	Open area	Grassy patches, Rizka fields
12.	Flying squirrel	Dense forest	Mahuwa grove
13.	Indian Pythen	Dense Forest	Along rivers
12.	Indian Crocodile	VakalRiver	Perennial waterhols.
13	Fin.sh Water Snake	Water Bodies	Wells anicuts
14.	Indian Chameleon	Dense forests	Foothill zone
15.	Fan-thrated Lizard	Open areas	Bushy and stony zone
16.	Rat snake	Forest area	wet nallahs
17.	Moniter lizard	Open area	Follow land field bunds, forest out sports
18.	Parots	Denser forests	Villages
19.	Peafowl	Open areas	Near villages

20.	Jungle fowl	Denser areas	Area having dense brshes, hilly interior tredes
21.	Waterfowl	Water bodies	Rivers, Dams, Village Ponds
22.	Grey partridge	Open areas	Bushy foothill zone.
23.	Painted partridge	Denser areas	Tall grass land zone with out crops
24.	Yellow - throated sparrow	Foothills Zone	Butea forests of foot hills
25.	Koel	Denser areas	Groves of villages
26.	Martins, swallows	Open aresas	Area full of crages
27.	Crested Tree swift	Open areas	Vicinity of water in Wakal river
28.	Fish	Water bodies	Flowing waters of Wakal, dams
29.	Amphibian	Moist and cool site	Moist and cool site

ANNEXURE – 42

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF TENDU PATTA UNITS AND PHADS

S. No	Name of Unit	No. of Phads	Location of Phods
1	Maidi (Range Mamer)	1 2 3 4 5 6	Maidi Dehri Atherta Vasela Mamer Morchhucha
2	Mahad (Range Mamer)	1 2 3 4 5 6	Mahad Ashawara Dotar Amba Sura Jher Sura
3	Umaria (Range Mamer)	1 2 3 4 5	Tekri Mahari Umaria Godalwara Sisvia
4	Dhedmariya (Range Kotra)	1 2 3 4 5 6 7 8 9 10. 11 12 13	Coura Palesar Thala Dhedmariya Phuldaria Maldar Kaucha NayaGaon Dingawari Patiya Bhakumka Dawala Beramia
5	Pathorpadi (Range Kotra)	1 2 3 4 5 6 7 8 9	Patherpadi Sem-ki-mahuri Gau-pipla Badli Khakkaria Dungaria BordiKala Luhari Khanchan
6	Panarwa (Range Panarwa)	1 2 3	Nalwa Panarwa Adahaldu

		4 5 6 7 8	Anjroli Gurad Buravada Mandwa Bitta
7	LathuniDaiya (Range Panarwa)	1 2 3 4 5 6 7	Ambasa Daiya Amba Ambavi Kaval Sarwan Lathumi

ANNEXURE – 43

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF OVERHANGS AND CAVES WITH LOCATIONS BY COMPARTMENT NUMBERS

Type of feature	Location	Forest Block	Comptt No.
Caves	KatawaliJher.	Daiya	4
	Vagh-Bhakra	Mamer	4
Overhang	KatavaliJher	Daiya	4
	Luhari	Phulwari	16

ANNEXURE – 44

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF WETLANDS WITH AREA STATEMENT AND LOCATIONS BY COMPARTMENT NUMBERS

Name and type of wetland	Location	Forest Black	Comptt. No.
Wakal River	Birothi to Patharpari via Panarwa	Harva DevliPhulwari	- 7,10,11,15,16,17 12, 15
BuxaKaNakaDam	Buxa village	Umaria	Bordering comptt. 6
HakarwaDam	Near Vasela village	Mamer	Bordering comptt. 6
Savan KyaraDam	Near Savan - KyaraVillage	Umaria	Bordering comptt. 8

ANNEXURE – 45

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF KEY AREA WITH LOCATIONS IN AND AROUND THE SANCTUARY

S. No	Name of key area	Range	Forest Block	Comp.	Location	Remark
1.	Rest House Panarwa	Panarwa	Phulwari	18	Panarwa	Used as Rest House
2.	Rest House Mamer	Mamer	Mamer	3	Mamer	Used as Rest House
3.	SomGhata	Panarwa	Som, Daiya	8	SomGhata	Temple
4.	WatchTower	Panarwa	Dharawan	8	Nalwa	WatchTower
5.	KatawaliJher	Panarwa	Daiya	4	Ambavi	Spring water & cave
6.	Bhagagarh	Panarwa	Daiya	23	-	Fort of RanaPratap
7.	Devligarh	Kotra	Devli	12	-	Fort of RanaPratap
8.	Bhilri mata devra	Panarwa	Phulwari	19	PhulwariKiNal	Used for worship
9.	SheelamataTemple	Panarwa	Dharawan	1	Manpur	Used for worship
10.	BhaderBavji	Kotra	Devli	7	Dungaria	Used for worship
11.	MatajiKa Devra (Bam ji mata)	Kotra	Harwa	4	Berothi	Used for worship
12.	PadaKhadraDevra	Mamer	Mamer	2	Mamer	Used for worship
13.	BamniMataDevra	Kotra	Dhedmariya	17	Dhedmariya	Used for worship
14.	Tum Raj ji	Mamer	Out skirts of	Near Compt	Gura	Used for

	Devra		Umaria	t.8 of Umaria		worship
15.	LeelagarhaBavji	Kotra	Phulwari	6	Luhari	Used for worship

ANNEXURE – 46

PHULWARI WILDLIFE SANCTUARY, RAJASTHAN

LIST OF FIELD EQUIPMENTS

S.No	Type of Equipment	No. available
1	Binoculars	**13**
2	Varnier Callipers	**-**
3	Micrometer scrugauge	**-**
4	Compass	**3**
5	G.P.S.	**8**

ANNEXURE – 47

The Budget Requirements
(Financial Forecast from 2025-26 to 2035-36)
RECURRING

1.Maintenance:

Items	25-26		26-27		27-28		28-29		29-30		30-31		31-32		32-33		33-34		34-35	
	Phy	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin**	**Phy**	**Fin.**	**Phy**	**Fin**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**
(I) Building	-	15.0	-	15.0	-	15.0	-	15.0		20.0	-	20.0	-	20.0	-	20.0	-	20.0	-	20.0
(II) Nature Trails	20 km	7.0	15 km-	5.0	15 km	5.0	15 km	5.0	15 km	5.0	20 km	8.0	15 km	6.0	15 km	6.0	15 km	6.0	15 km	6.0
(III) Moter Vechile	-	2.0	-	2.0	-	2.0	-	2.0	-	5.0	-	5.0	-	5.0	-	5.0	-	5.0	-	5.0
(IV) Wireless Network	**-**	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0
(V) Water Facilites	-	4.0	-	4.0	-	4.0	-	4.0	-	5.0	-	5.0	-	5.0	-	6.0	-	6.0	-	6.0
(VI) Fire Protection	30 km	6.20	40km	8.0	28km	5.6	28km	5.6	29k m	7.25	35k m	8.75	27 km	8.10	27 km	8.10	29k m	8.70	38 km	11.40
(VII) Publicity & Extension	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	3.0	-	3.0	-	3.0
(VIII) Maint. Of Forest Boundary	-	5.00	-	5.00	-	5.00	-	5.00	-	5.00	-	10.00	-	10.00	-	10.00	-	10.00	-	10.00
(IX) Secret Information System	-	0.50	-	0.50	-	0.50	-	0.50	-	0.75	-	0.75	-	0.75	-	0.75	-	1.00	-	1.00
(X) Reward to Staff	-	0.50	-	0.50	-	0.50	-	0.50	-	0.50	-	0.75	-	0.75	-	0.75	-	0.75	-	0.75

(X) Compensta-ion ForCattle kill & loss to human life	-	10.0	-	10.0	-	10.0	-	10.0	-	15.0	-	15.0	-	15.0	-	15.0	-	15.0	-	15.0
(XI) Maint.of Anicut & other structures	4	4.00	3	3.00	4	4.0	3	3.0	3	3.0	3	3.0	3	3.0	3	3.0	3	3.0	3	3.00
(XII) Research and Training	-	2.0	-	2.0	-	2.0	-	2.0	-	3.0	-	3.0	-	3.0	-	3.0	-	3.0	-	3.0
(XIII) Maint. Of Equipments	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0
(XIV) Maint. Of Forest roads	-	3.0	-	3.0	-	3.0	-	3.0	-	5.0	-	5.0	-	5.0	-	5.0	-	5.0	-	5.0
(XVI) Maint. Of ficus groves & development of birding points	-	1.0	-	1.0	-	1.0	-	2.0	-	2.0	-	2.0	-	2.0	-	3.0	-	3.0	-	3.0
(XVII) Maint of herbarium	-	1.0	-	1.0	-	1.0	-	1.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0	-	2.0
Total works recurring		66.2		65.0		63.6		63.6		83.5		93.25		90.6		93.6		94.45		97.15

NON RECURING

2. SANCTUARY MANAGEMENT

Items	25-26		26-27		27-28		28-29		29-30		31-32		32-33		33-34		34-35		35-36	
	Phy	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**
(I) Survey & Demarcation	150 B. Pillar	2.10	150	2.10	150	2.10	150	2.10	150	2.10	150	3.0	150	3.0	150	3.0	150	3.0	150	3.0
(II) Nature Trails	12km	11.0	9km	8.0	9km	8.0	9km	8.00	9km	8.0	12km	14.0	9km	10.0	9km	10.0	9km	10.0	9km	10.0
(III) Buildings	3	30.0	3	30.0	3	30.0	2	20.0	2	20.0.	2	25.0	2	25.0	2	25.0	2	25.0	2	25.0
(IV) Soil & Water Cons./DLT Works	1050ha	300.0	550	150.0	500	150.0	300	90.0	300	90.0	300	90.0	300	90.0	300	90.0	300	90.0	300	90.0
(V) Habitat Improvemen-ts	400ha	180.0	400	180.0	400	180.0	400	180.0	400	180.0	300	160.0	300	160.0	300	160.0	300	160.0	300	160.0
(VI)Construction of Causeway	5	15.0	4	12.0	4	12.0	4	12.0	4	12.0	3	10.00	3	10.00	3	10.00	3	10.00	3	10.00
(VII) New Well digging	4	16.00	4	16.00	3	12.0	3	12.0	3	12.0	3	14.0	3	14.0	3	14.0	3	14.0	3	14.0
(VIII) Communication network	L.S.	1.00		1.00		1.00		1.00		1.00		2.00		2.00		2.00		2.00		2.00
(IX) Fire Arms.	L.S.	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
(X) Checkpoints & Barriers	2	5.0	2	5.0	L.S	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0

(XI) Pasture Develop.	300ha	150.0	300ha	150.0	300ha	150.0	300ha	150.0	300ha	150.0	200ha	120.0	200ha	120.0	200ha	120.0	200ha	120.0	200ha	120.0
(XII) Weed Eradication	L.S.	25.0	-	25.0	-	25.0	-	25.0	-	25.0	-	30.0	-	30.0	-	30.0	-	30.0	-	30.0
(XIII) Stone wall fencing (pucca) near villages	3km (6ft ht)	120.0	3km	120.0	3km	120.0	3km	135.0	3km	135.0	3km	135.0	3km	135.0	3km	150.0	3km	150.0	3km	150.0
(XIV) Devlopment of biodiversity clouser	500ha	300.0	500ha	300.0	500ha	300.0	500ha	300.0	500ha	300.0	500ha	350.0	500ha	350.0	500ha	350.0	500ha	350.0	500ha	350.0
(XV) Amount for compensation	L.S.	15.0		15.0		15.0		15.0		15.0	-	20.0		20.0		20.0		20.0		20.0
(XVI) Creation of Relocation center	L.S.	150.0	-	-	-	-	-	-	L.S.	150.0	-	-	-	-	-	-	-	-	-	-
(XVII)Const. Of View Towers/Hides	2	5.00	2	5.00	2	5.00	1	2.50	1	2.50	1	3.0	1	3.0	1	3.0	1	3.0	1	3.0
TOTAL		1326.1		1020.1		1012.1		954.6		1084.6		978.0		974.0		989.0		989.0		989.0

3.Infrastructure Development:

Items	25-26		26-27		27-28		28-29		29-30		31-32		32-33		33-34		34-35		35-36	
	Phy	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**
(I)Vehicles	-	12.00	-	12.00	-	12.00	-	2.00	-	15.00	-	2.00	-	2.00	-	2.00	-	2.00	-	2.00
(II)Wireless Systems	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00
(III)Office Equipments	L.S.	2.00	-	2.00	-	2.00	-	2.00	-	2.00	-	2.00	-	2.00	-	2.00	-	2.00	-	2.00
(IV)Specialised Field Equipments for protection & fire fighting	L.S.	2.00	-	2.00	-	3.00	-	3.00	-	3.00	-	3.00	-	3.00	-	4.00	-	4.00	-	4.00
(V) Const. of guzzler/water points	3	21.0	3	21.0	2	14.0	2	15.0	2	15.0	2	16.0	2	16.0	2	16.0	2	16.0	2	16.0
(VI) Anicuts	3	15.0	3	15.0	3	15.0	3	18.0	3	18.0	3	18.0	3	18.0	3	18.0	3	18.0	3	18.0
(VII)Creation of fire lines	L.S.	5.00	-	5.00	-	5.00	-	5.00	-	5.00	-	5.00	-	8.00	-	8.00	-	8.00	-	8.00
(VIII) Fire Watch Tower(New)	2	12.0	2	12.0	2	12.0	2	14.0	2	14.0	2	14.0	2	14.0	2	14.0	2	14.0	2	14.0
(IX) Construction of Talai	4	8.0	4	8.0	3	6.0	3	6.0	3	9.0	3	9.0	3	9.0	3	9.0	3	9.0	3	9.
TOTAL		78.0		78.0		70.0		66.0		82.0		70.0		73.0		74.0		74.0		74.0

4.Ammenities For Field Staff:

Items	25-26		26-27		27-28		28-29		29-30		30-31		31-32		32-33		33-34		34-35	
	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.
(I) Basic Ammenities	4	4.00	4	4.00	3	3.00	3	3.00	3	3.00	3	3.00	3	3.00	3	3.00	3	3.00	3	3.00
(II) Camping equipments	5	2.00	5	2.00	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00
TOTAL		6		6		4		4		4		4		4		4		4		4

5.Tourism Facilities:

Items	25-26		26-27		27-28		28-29		29-30		30-31		31-32		32-33		33-34		34-35	
	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.	Phy	Fin.
(I) Tourism facilities		2.00		2.00		2.00		2.00		2.00		3.00		3.00		3.00		3.00		3.00
(II)Pamphlets/Brochur-es		0.50		0.50		0.50		1.00		1.00		1.00		1.00		1.50		1.50		1.50
(III)Interpretation/Learning Center	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--	-	-	-
(IV)Development of Camping site and other EcoTourism Development Works	1.Maint. Of Eco. Tourism site Panarva 2.Eco destination Patherpadi 3.Dev. of Eco tourism site Mal.	38.00	1.Dev. Of Katavali-Jher Eco Site 2. Eco destination Mamer	15.00		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL		40.5		17.5		2.5		3		3		4		4		4.5		4.5		4.5

6.Information Technology:

Items	25-26		26-27		27-28		28-29		29-30		30-31		31-32		32-33		33-34		34-35	
	Phy	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**
(I) Computers	L.S.	1.00		100		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
(II) Survey Equipments	L.S.	0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50
TOTAL		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5

7.Village Eco Development:

Items	25-26		26-27		27-28		28-29		29-30		30-31		31-32		32-33		33-34		34-35	
	Phy	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**
(i) Entry point Activites	L.S.	10.0		10.00		10.00		10.00		10.00		10.00		10.00		10.00		10.00		10.00
(II) Eco Devlop. Activites	L.S.	6.0		6.0		6.0		6.0		6.0		7.50		7.50		7.50		9.00		9.00
(III)Agroforestry works	L.S.	0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50
TOTAL		16.5		16.5		16.5		16.5		16.5		18		18		18		19.5		19.5

8.Environmental Awareness Programme:

Items	25-26		26-27		27-28		28-29		29-30		30-31		31-32		32-33		33-34		34-35	
	Phy	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**
(I)Development and procurement of Education Material	L.S.	0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5		0.5
(II)Awareness Programmes	L.S.	1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00		1.00
TOTAL		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5		1.5

9.Research, Monitoring, Training & Census:

Items	25-26		26-27		27-28		28-29		29-30		30-31		31-32		32-33		33-34		34-35	
	Phy	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**	**Phy**	**Fin.**
(i) Research Studies	L.S.	0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50		0.50
(II) Monitoring Studies	L.S.	0.25		0.25		0.3		0.3		0.3		0.3		0.4		0.4		0.4		0.4
(III)Census	L.S.	1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0		1.0
(IV)Training	L.S.	1.0		1.0		1.0		1.0		1.0		1.5		1.5		1.5		1.5		1.5
(V) preparation of APO	L.S.	0.10		0.10		0.10		0.10		0.10		0.10		0.10		0.10		0.10		0.10
(VI) preparation of Management plan	L.S.	0.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L.S.	2.00
Total Non Recurring		**1473.75**	-	**1143.95**	-	**1111**	-	**1050**	-	**1196**	-	**1080.4**	-	**1079.5**	-	**1096**	-	**1097.5**	-	**1099.5**
Sum of Recurring and Non Recurring items		**1539.95**	-	**1208.95**	-	**1174.6**	-	**1113.6**	-	**1279.5**	-	**1173.65**	-	**1170.1**	-	**1189.6**	-	**1191.95**	-	**1196.65**