

WILDLIFE RESEARCHES

S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
1	Surveys of habitat assessment of crocodiles and steps to mitigate man-animal conflict.	<ul style="list-style-type: none"> Principal Investigator: JIGAR N UPADHYAY Financial details: year of start and completion: remarks: complete study area: VADODRA, ANAND, KHEDA 	<ul style="list-style-type: none"> To understand distribution of <i>Crocodylus polustris</i> (mugger crocodile) in the study area and the basis of human crocodile conflict as well as suggestions for prevention of possible conflict. 	<ul style="list-style-type: none"> maximum presence of crocodile is in Vadodara dist. followed by Kheda than Anand; Crocodiles inhabit ponds and farms; 70% people of the area uses waterbodies directly for different works. About 50% people take pride in having crocodiles in their area; Major conflict season mid-march to July end. 	<ul style="list-style-type: none"> Pictured sign boards in sensitive areas. Safety pamphlets distribution during high conflict period. Involvement of media for awareness. Increase frequency of alerts/ awareness work during high conflict period. Identifying highly sensitive areas in terms of conflict and preparing crocodile. Exclusion enclosures at Ghats frequently used by people. Preparation of <i>Ovaro</i> / Ghats as alternative. Equipped and skilled mobile rescue center in area of high conflict.

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2	Status conservation and management of tree groves of forest and non-forest areas of Kutchchh district, Gujarat.	<ul style="list-style-type: none"> • Principal investigator: GUJARAT INSTITUTE OF DESERT ECOLOGY • Year of start and completion : • Financial details: • remarks: complete 	<ul style="list-style-type: none"> • Documentation of the trees and sacred groves in Kutchchh dist. • Assessment of floral and faunal composition • Identification of threats • Documentation of cultural association of local communities • Developing conservation and management strategies • To identify species and site specific wildlife damage problems, extent and severity in selected study areas. 	<ul style="list-style-type: none"> • Total 173 tree groves in Kutchchh dist. • maximum in Mandvi taluka • 162 from non-forest areas and 9 from forest areas • Floral diversity: 193 species of plants were recorded from 173 groves. • <i>Ficus bengalensis</i> is the most common tree • Other common species are neem, <i>Ficus religiosa</i>, etc. • species diversity index(Shannon diversity indices) : max groves have medium species diversity of trees, shrubs and herbs ; rich diversity found in 2 groves Sadhay Pir and Oran Mata; • faunal diversity: 12 sp. of mammals, 11 species of reptiles,3 sp. of amphibians, 17 sp. of insects, 2 sp. of spiders and 36 species of birds • 25% of tree groves are facing natural/ anthropogenic threats • 12 tree groves showed presence of Indian flying fox. 	<ul style="list-style-type: none"> • formation of biodiversity management committees for conservation of tree groves by respective BMC of gram panchayat who will be responsible for preparation and implementation of management plan of groves • State forest department may support funds and technical guidance to these committees. • posters, sign board for groves to generate awareness, belongingness and sense of pride among locals • Groves such as Sharvan Kavadiya, Guneri, Oran mata, Sadhay Pir and Bharadi Mata can be developed as biodiversity heritage sites by government of Gujarat.

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3	Development of appropriate techniques for minimizing man-animal conflict	<ul style="list-style-type: none"> • Principal investigator: Dr. N.P.S Chauhan and Devendra Kumar • Year of start and completion : 2009-2011 • Financial details: • remarks: complete 	<ul style="list-style-type: none"> • to guide procurement and fabrication of cost-wise and technically effective equipment for mitigation of conflict • To evaluate and formulate appropriate and cost effective mitigation strategies. • To establish a database on wildlife conflict and their control. 	<p>1. In spite of increased biotic pressure in selected areas, wildlife population are on increase.</p> <ul style="list-style-type: none"> • Highly affected talukas: • Godhra FD (Sloth bear and Leopard) : Kalol • Baria FD (Sloth bear and Leopard): Devgarh Baria, Dhanpur, Limkheda. • Chotta udepur (Sloth bear and Leopard) : NA • Rajpipla (sloth bear, crocodile and leopard): - Dediapada(livestock depredation) • Vyara FD (leopard): low • Valsad FD: (leopard): low • Dang (north) FD: (leopard): NA • Dang (south) FD (leopard): NA 	<ul style="list-style-type: none"> • This study will help in preparing an exclusive species specific and site specific wildlife conflict map for whole of the state. • Thus guided by these map, low, medium and high intensity (based on extent of wildlife conflict) areas can be separated out for mitigation priorities. • Species specific mitigation in respected areas (in the area where that species is in major conflict); strategies, skill development and rescue centers can be developed. • Extreme caution to be taken while translocating problem carnivores, as it will create problem in both the areas of translocation and area from where translocated.

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		<ul style="list-style-type: none"> • Study area: In and around protected areas and managed forests of east south Gujarat; Panchmahal, Vadodara, Dahod, Narmada, Tapi, Valsad, Dang and Jessore wildlife sanctuary. 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • Jessore WLS: (sloth bear) 20 out of 25 surveyed villages were affected. Mainly during summers and monsoon. Major damage to wheat and maize crop during crop maturation time. • WLS (sloth bear, Nilgai, wild pig): highest damage to in and around villages is to maize and <i>tuar</i> crop. <p>Most affected districts by Nilgai crop (mainly maize and wheat) depredation: Areli, Banaskantha, Kutch, Patan and Rajkot.</p>	<ul style="list-style-type: none"> • Bears can be translocated in a better habitat areas as they do not have a much high homing instinct. (Previously analyzed and selected areas). Awareness about animal behavior. • Inclusive management plan involving both villages and forest area to imply measures like change in crop pattern (ramtil, arhar), encouraging high yielding cattle. • And sloth bear are major conflict species in whole of the study area. • Toilets in all households (along with line departments). • Camping for cattle grazing should not be allowed.

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		•	•	•	<ul style="list-style-type: none">• Plantation of Ficus species and other fruit trees inside forest area (sustainable food source for bear all year round).• Dens in the forest should be strictly monitored for disturbances.• Rescue centers with state of art technology in highly sensitive areas.• Boulder hillocks and such areas should be preserved strictly as are most preferred den sites.• All the range offices to be given a small booklet of preparation of trapping and rescue equipment which can built by local material and skill.• Live fencing can be a cost effective and eco-friendly measure.

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		•	•	•	<ul style="list-style-type: none">• Vigilance, readiness and alerts during crop maturation and harvesting time as highly sensitive time for crop depredation and even human wildlife interaction• Time of any conflict mitigation to be strictly monitored and efforts are needed to decrease response time.• A detailed study is recommended on ecology of sloth bear in Ratanmahal WLS and Chotta Udepur, Vadodara district.• Mitigation options: fear provoking stimuli, chemical repellents, fences (live, electrical, stone walls), capture and translocation, fertility control and culling (for vermin).

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4	Wetland and water bird heritage of Gujarat- AN Illustrated Directory	<ul style="list-style-type: none"> • Principal Investigator: Dr. Ketan Tatu • financial details: • period of study: December 2012 • the report was a outcome of the Project “Wetlands and water birds of Gujarat- Status report of wetlands and water birds of Gujarat state including a wetland directory” 	<ul style="list-style-type: none"> • To compile a detailed illustrated directory of wetlands and water birds and to give an insight into their management. 	<ul style="list-style-type: none"> • given a detailed list of different type of wetlands and their unique flora fauna (illustrated) , species richness and water bird abundance level, socioeconomic dependency, site descriptions and threats: <ol style="list-style-type: none"> 1. DAMS 2. IRRIGATION RESERVOIRS 3. NATURAL LAKES 4. VILLAGE PONDS 5. CITY RESERVOIRS 6. SALT PANS 7. MARSHY WETLANDS 8. OTHER INLAND WETLANDS <p>DAMS</p> <p>Aji- 1 dam (Rajkot): on Aji river</p> <ol style="list-style-type: none"> 1. Species richness: 24sp. suitable for piscivorous water birds and diving ducks only due to absence of vegetation and predominance of above mentioned birds. 2. Water bird abundance level: High to Medium. 3. threats: quarrying, prosopis spread, pollution <p>• Ajwa dam (Vadodara): proposed Ramsar site.</p> <ol style="list-style-type: none"> 1. species richness: 25 sp. water bird abundance level: medium to high 2. threats: socioeconomic dependency on dam, pollution, irresponsible tourism 	<ul style="list-style-type: none"> • Detailed resource which can be used in preparation of management plan of respective wetlands. • A quick reference can be prepared from the study for seeing which area to be given importance in terms of wetland according to the species richness and abundance and what managerial interventions might be needed. • Study suggested that many reservoirs and dams (under irrigation department regulation) shows extraordinary avifauna presence and thus be managed by forest department for technical support in close association with irrigation department. •

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		•	•	<p>Amipur dam (Porbandar):</p> <ol style="list-style-type: none"> 1. Species abundance: 78 sp. proposed Ramsar site. Best habitat diversity. Migratory birds in abundance. 2. water bird abundance level: Abundant 3. Threats: extreme socioeconomic dependency on dam, overexploitation of water during lean periods. <p>Bardasagar dam (Porbandar):</p> <ol style="list-style-type: none"> 1. Species abundance: 72. Supports many migratory birds. Most vegetated wetland habitat. Only wetland in Gujarat where adult Dalmatian pelicans was found in breeding plumage. 2. water bird abundance level: very high to abundant 3. Threats: medium socioeconomic dependency, prosopis spread. <p>Bhimdad dam (Bhavnagar district):</p> <ol style="list-style-type: none"> 1. Species abundance: 16. 2. water bird abundance level: High 3. Threats: extraction of wetlands fertile soil by villagers. <p>Dantiwada dam (Banaskantha):</p> <ol style="list-style-type: none"> 1. Species abundance: 26 important area of bar headed goose and grey leg goose. 2. water bird abundance level: very high 3. Threats: intensive agriculture practices in vicinity of dam, algal blooming due to man induced eutrophication due to excessive use of fertilizers. 	<ul style="list-style-type: none"> • Majority of dams have harsh embankments which leaves no scope for open shore land area important for resting/roosting by various avifauna. Thus study suggests floating wooden planks -tarapas, may be anchored on the edges. Selected dams (very rich in avifauna diversity and abundance) should be given protection from poaching by regular patrolling of the area or some other methods and these areas should be under Dual control of forest and irrigation department.

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		•	•	<p>Dev dam (Panchmahal):</p> <ol style="list-style-type: none"> 1. Species abundance: 55. Proposed Ramsar site. 2. water bird abundance level: high to abundant 3. Threats: legally unprotected wetland. <p>Dharoi dam (Sabarkantha):</p> <ol style="list-style-type: none"> 1. species abundance: poor 2. water bird abundance level: high 3. Threats: shore land cultivation, overgrazing, fishing. <p>Ghee dam (Jamnagar): Life-line of Khambhaliya city (famous for ghee).</p> <ol style="list-style-type: none"> 1. species abundance: at least 15 2. water bird abundance level: medium 3. Threats: fishing, town water supply. <p>Hathmati dam: well known for migratory birds' habitat.</p> <ol style="list-style-type: none"> 1. species abundance: 49 2. Water bird abundance level: medium to very high. 3. Threats: over dominance of rocks on shoreline, algal bloom near shoreline. <p>Karjan lake (Narmada):</p> <ol style="list-style-type: none"> 1. Species abundance: at least 16 proposed Ramsar site. 2. Water bird abundance level: medium to high. 3. Threats: poaching, dependency on dam for irrigation. 	<ul style="list-style-type: none"> • Provision islets inside of important dams/reservoirs. • Awareness by posters, signboards about the rich bird life near the dams and reservoirs. • Mechanical control (rather than chemical control) of weedy growths in reservoirs. • To address problem of vegetation choked wetlands/cultural eutrophication it should be strictly checked that important birding areas should not cross hemi-marsh condition (50:50 ratio of water: vegetation). surrounding agricultural lands should be discouraged for using nitrate and phosphate fertilizers and use organic ones(long term solution) • Control on irrigation pressure on wetlands.

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		•	•	<p>Lakhi Dam (Surat):</p> <ol style="list-style-type: none"> 1. Species abundance: 37. duck dominated 2. Water bird abundance level: medium to high. 3. Threats: high poaching through poisoning with phorate. <p>Machan nala (Dahod):</p> <ol style="list-style-type: none"> 1. species abundance: 32 proposed Ramsar site 2. water bird abundance level: very high 3. Threats: legally unprotected, cultivation on shore line. <p>Madhuvanti dam (Junagarh):</p> <ol style="list-style-type: none"> 1. species abundance: 32 2. water bird abundance level: medium to high 3. threats: irrigation causing rapid depletion of water <p>Mathal dam (Kutchchh):</p> <ol style="list-style-type: none"> 1. species abundance: 34 2. Water bird abundance level: low to medium. 3. Threats: absence of hydrophytic vegetation. <p>Rudramata dam (Kutchchh):</p> <ol style="list-style-type: none"> 1. species abundance: 26 2. water bird abundance level: low to med 3. Threats: absent hydrophytic vegetation. <p>Ishan dam (Jamnagar):</p> <ol style="list-style-type: none"> 1. species abundance: 34 2. water bird abundance level: M TO H 3. threats: unknown 	<ul style="list-style-type: none"> • A mechanism of water level control to be thought of to keep important wetland water level as per need. one suggestion is interlinking of main wetland with its satellite wetlands to control water levels (e.g. Thol wetland) • uncontrolled fishing in important wetlands need to be checked by preparing a sustainable fishing program by controlling number of boats to be allowed/day, no of fishing nets/day and hours of fishing/day etc. in no case fishing should be allowed during nesting season of heronary forming birds (at least in PA ,IBA, and potential Ramsar sites..)

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		•	•	<ul style="list-style-type: none"> • Sipu dam (Banaskantha): <ol style="list-style-type: none"> 1. species abundance: 14 2. water bird abundance level: low to medium 3. Threats: over dominance of rocks on shoreline, algal bloom. • Sukhbhadar dam (Bhavnagar): <ol style="list-style-type: none"> 1. Species abundance: 33 proposed Ramsar site. 2. water bird abundance level: high 3. Threats: fishing, poor habitat diversity. • Tappar dam (Kutchchh): <ol style="list-style-type: none"> 1. species abundance: 28 2. water bird abundance level: medium 3. Threats: absence of hydrophytic vegetation. • Other dams are: Aji11, Brahmni, Lalpari dam, Nayaka dam, Nayari1 dam, nayari11 dam, and Veri dam. <p>RESERVOIRS:</p> <ul style="list-style-type: none"> • Kanewal (Anand): wetland of national importance by MOEF <ol style="list-style-type: none"> 1. Species abundance: 62 proposed Ramsar site. 2. water bird abundance level: 3. Threats: legally unprotected, poaching, excessive floating debris decomposed submerged vegetation, no control on water level for water bird point of view as under irrigation department. 	<ul style="list-style-type: none"> • Rich wetland should be given one or the other legal conservation status interpretation complexes in PA, IBA etc. natural wetlands sincere efforts to be made to maintain their natural characteristics. Entry of foreign water should be strictly checked.

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		•	•	<ul style="list-style-type: none"> • Naghrama Talav (Kheda) <ol style="list-style-type: none"> 1. Species abundance: 28 proposed Ramsar site. 2. Water bird abundance level: high to very high. 3. Threats: spread of <i>Nelumbo nucifera</i>, other weeds, decaying vegetation covers 50% water spread. • Narda Reservoir (Kheda): <ol style="list-style-type: none"> 1. Species abundance: 22 species proposed Ramsar site. 2. water bird abundance level: - 3. Threats: vegetation choked status of wetland, irrigation pressure. • Paalan (Valsad): <ol style="list-style-type: none"> 1. species abundance: 45 2. water bird abundance level: low to medium 3. Threats: vegetation choked status of wetland, irrigation pressure. • Pariej (Kheda) wetland of national importance by MOEF (ecotourism site by FD) : <ol style="list-style-type: none"> 1. Species abundance: 65 proposed Ramsar site. 2. Water bird abundance level: abundant. 3. Threats: irrigation pressure, fishing contracts. • Saiyant Sichai talav (Kheda): <ol style="list-style-type: none"> 1. species abundance: 22 2. water bird abundance level: M to H 3. Threats: irrigation pressure, absence of tree scrub shield from human habitation. 	<ul style="list-style-type: none"> • Concept of Kutchchh biosphere reserve (including Charri Dhandh, Bhagadiyo thath, Vekariya dhandh, Servo dhand, Kirovalo kar, and Banni grassland) forms a contiguous habitat. is been proposed in this study to be protected and managed in conjugation with each other as city/village reservoirs can be used for awareness and recreational purposes. • marshy wetlands should be managed to keep their marshy habitat intact (by controlling pollution from foreign waters) • Bhaskarpura marsh is the only wetland in the country to have photographic evidence of black tern (vagrant species for India). Thus strict protection status to be provided to the area.

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		•	•	<ul style="list-style-type: none"> • Thol talav (Mehsana): Wetland based WLS, nationally imp. & Important bird Area (IBA) <ol style="list-style-type: none"> 1. Species abundance: 40, imp. For migratory birds. 2. water bird abundance level: very high 3. Threats: algal bloom, weed like <i>Ipomea carnea</i>. High water level at times, (suggestion of creating a water network between Thol and its satellite wetlands). • Traj talav (Kheda): <ol style="list-style-type: none"> 1. Species abundance: 20 proposed Ramsar site. Globally threatened sp. recorded. 2. water bird abundance level: Medium to High 3. Threats: irrigation pressure, aquatic weeds. • Vasai tank (Ahmedabad): <ol style="list-style-type: none"> 1. species abundance: 39 2. water bird abundance level: above average 3. Threats: legally unprotected, heavy algal bloom, irrigation pressure. • Wadhvana reservoir (Vadodara): <ol style="list-style-type: none"> 1. Species abundance: 44 proposed Ramsar site. 2. water bird abundance level: Abundant 3. Threats: uncontrolled water level as per avifauna requirement (as under irrigation dept.), decomposing vegetation. • other irrigation reservoirs: Savily (Kheda), Rani Porda (Kheda), Waghroli (Kheda), Heranj (Kheda), Daloli (Anand), Navaa Talavv (Surendranagar), Sripor Timbi (Vadodara). 	<ul style="list-style-type: none"> • wetland being a very important area visited by large number of Demoiselle crane and other migratory birds managerial interventions are suggested like : strip plantation of native species tree on the portion of road to separate marsh from traffic roads direct

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		•	•	<p>NATURAL LAKES:</p> <ul style="list-style-type: none"> • Chaari Dhandh Lake: Conservation Reserve, it is a seasonal inland wetland in India's largest grassland Banni, salt affected shallow wetland, Important Birding Area, proposed Ramsar site. 1. species abundance: 60 2. water bird abundance level: Abundant 3. Threats: heavy socioeconomic dependency for biomass requirement, migratory cattle hers from faraway places causes extreme grazing pressure. • Nalsarovar Lake (Ahmedabad & Surendranagar): Important Birding Area (IBA), Bird Sanctuary, proposed Ramsar site. 1. species abundance: 117 2. water bird abundance level: Abundant 3. Threats: excessive growth of submerged aquatic vegetation that forms a thick mat of decaying vegetation is a management issue, heavy population of coots. <p>VILLAGE PONDS:</p> <ul style="list-style-type: none"> • Bhimsar talav (Kutchchh): 1. species abundance: 20 2. Water bird abundance level: low to medium. 3. Threats: emergent hydrophytic growth needs to be controlled. • Bhimasar Talav (Kutchchh): 1. species abundance: 11 2. water bird abundance level: medium 3. Threats: solid waste dumping. 	•

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		•	•	<ul style="list-style-type: none"> • Fadvel talav (Valsad): <ol style="list-style-type: none"> 1. species abundance: 8 2. Water bird abundance level: low- moderate. 3. Threats: vegetation choked state. • Govindpur pond (Mehsana): considered as a satellite wetland for Thol. <ol style="list-style-type: none"> 1. species abundance: 12 2. Water bird abundance level: Average. 3. Threats: legally unprotected, pollution. • Nadan (Mehsana): satellite wetland for Thol. <ol style="list-style-type: none"> 1. species abundance: 10 2. water bird abundance level: average 3. Threats: legally unprotected, pollution. • Ningal (Kutchchh): <ol style="list-style-type: none"> 1. species abundance: 21 2. water bird abundance level: low- medium 3. Threats: pariah dogs, disturbance from village, sewage pollution. • Other village ponds: Bhandrej, Vada talav, Gobhlaj, Damri. <p>CITY RESERVOIRS:</p> <ul style="list-style-type: none"> • Gaurishankar lake (Bhavnagar): <ol style="list-style-type: none"> 1. species abundance: 18 2. Water bird abundance level: low to medium. 3. Threats: solid waste and sewage dumping. • Lakhota lake (Jamnagar): <ol style="list-style-type: none"> 1. species abundance: 18 2. water bird abundance level: 3. Threats: sewage, solid waste dumping, pollution. 	•

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		•	•	<p>• Hamirsar (Kutchhh): Dalmatian pelicans visit this wetland.</p> <ol style="list-style-type: none"> 1. species abundance: 23 2. water bird abundance level: average 3. Threats: excessive water pumping, motor boat pollution, littering. <p>SALT PANS:</p> <p>• Kumbharwada (Bhavnagar): known for Flamingos.</p> <ol style="list-style-type: none"> 1. species abundance: 20 2. Water bird abundance level: above average. May reach to abundant at certain period due to Flamingos. 3. Threats: overhead transmission cables, human disturbances. <p>• Charakla salts (Jamnagar): IBA. Known for huge congregation of black necked Grebe in winters.</p> <ol style="list-style-type: none"> 1. species abundance: 121 2. water bird abundance level: abundant 3. threats: unknown 4. Good conservation efforts by Tata chemicals along with forest dept. are done. water level control in salt pans according to the avifauna needs 	•

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		•	•	<p>MARSHY WETLANDS</p> <ul style="list-style-type: none"> • Bhaskarpura (Surendranagar): place of first photographic evidence of Black tern. <ol style="list-style-type: none"> 1. species abundance:- 2. water bird abundance level: low to medium 3. Threats: fishing, irrigation pressure. • Devisar pond (Kutchchh): <ol style="list-style-type: none"> 1. species abundance:31 2. Water bird abundance level: medium to high. 3. threats: irrigation pressure, overgrowth of <i>Prosopis juliflora</i> • Kuchhadi jawar (Porbandar): <ol style="list-style-type: none"> 1. species abundance: 14 2. water bird abundance level: very high 3. Threats: prosopis spread, windmills, transmission lines, dense algal bloom. <p>OTHER INLAND WETLANDS:</p> <ul style="list-style-type: none"> • Gosa Bara (Porbandar): Proposed Ramsar site. <ol style="list-style-type: none"> 1. species abundance: 66 2. Water bird abundance level: above very high. 3. Threats: turbidity in water may be due to pollution. • Khijadiya wetlands (Jamnagar): IBA a mix of salt pans, intertidal flats and freshwater <ol style="list-style-type: none"> 1. species abundance: 70 2. water bird abundance level: abundant 3. Threats: unknown as the area is well protected bird sanctuary. 	•

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5	Study of wetlands habitat in Kutchchh district and suggesting stakeholder driven management strategies.	<ul style="list-style-type: none"> • Principal Investigator: GUJARAT INSTITUTE OF DESERT ECOLOGY • Financial details: • year of start and completion: 2008 • remarks: complete • study area: Kutchchh district 	<ul style="list-style-type: none"> • mapping of wetlands of Kutchchh • study of soil, water quality, vegetation characteristics, benthic organism, fish and other vertebrates • seasonal monitoring of bird population • Assessing social value and anthropogenic pressure. • suggestions • Creation of GIS based Kutchchh wetland information system. 	<ul style="list-style-type: none"> • List of taluka wise wetlands of Kutchchh district with their topo sheets, area extent, size classes, changes in site/extents. • total wetlands including satellite imagery and topo sheet are 340 wetlands • Change in extent between 1968 and 19988: about 100 wetlands were found common in both 1968 and 1998 maps. Among these 100 wetlands, only 24 wetlands showed decrease and 76 showed increase in extent between 1964 and 1998. • Recorded 203 plant sp. belonging to 57 families in and around these wetlands. • A total of 14 aquatic and 42 semi aquatic sp. recorded. • Munjar talav recorded highest TDS, turbidity due to interaction of cattle and other animal movement. Dissolved Oxygen is within safer limits in almost all wetlands. • The number of phytoplankton was recorded high in all the selected wetlands. • Number of zooplanktons recorded was comparatively lesser may be due to the temporary nature of water influenced by aridity and rainfall. • seasonal variation in the abundance of benthic fauna with high in winter and low in summers • 179 wetlands survey revealed 89 species. • 17 sp of threatened category, • stakeholders strongly opined that salt works, jetty, ports construction etc. are posing serious threats to the mangroves and thereby their livelihood 	<p>problems and their management suggestions:</p> <ul style="list-style-type: none"> • pollution: construction of separate Water tanks for usage of cattle/domestic use with required canal system to prevent waste water discharge into wetland. • Grazing: livestock being major livelihood of Kutchchh and during summer wetlands are the only areas with fodder availability, wetlands faces a high overgrazing problems. Motivation of the people dependent on these wetlands to cut and store excessive grass only during good rainfall years in form of hay and silages. • weed: prosopis eradication with the help of stake holders • Ecotourism as a livelihood option and resource management. • Preparation of an inclusive wetland management plan and its implementation in conjugation with the stakeholders.

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		•	•	<ul style="list-style-type: none"> • . • 90% of respondent felt that removal of <i>ganda baval</i> is the most urgent requirement to arrest the degradation of waterbody. • participatory appraisal of natural resources done in the study showed that the stakeholders have strong views and ideas for the better management of the concerned wetlands as their livelihood depends on them. • Better water source usage by inter connecting overflowing and water lacking wetlands. • Many wetlands could be well managed by using the traditional knowledge of the local people. • Six wetlands facing highest threats are: Karoghogha, Munjasar, Paragsar, Changadasar, Pachaso and Charri. 	•

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6	Study of wetland habitat in north and central Gujarat region and suggesting management strategies for it.	<ul style="list-style-type: none"> • Principal Investigator: Dr. B.M. Parasharya & Dr J.J .Jani (AINP on agricultural ornithology Anand Agriculture University. • Financial details: • year of start and completion: 2005 • remarks: complete • study area: wetlands of Anand, Kheda, Banaskantha, Sabarkantha, and Panchmahal districts of north and central Gujarat 	<ul style="list-style-type: none"> • Selection of promising wetlands after making total inventories. • Study of soil, water quality, vegetation, invertebrates and vertebrates. • monitoring of bird population with emphasis on migratory birds • study on nesting birds • Impact of anthropological pressure over selected sites. • Suggesting suitable management strategies. 	<ul style="list-style-type: none"> • Water quality parameters like ph, E.C, DO, B.O.D lie within the optimal range in the selected study areas. • Human pathogens were found absent from all wetlands and if treated properly, water from all wetlands can be made portable. • Soil at Hathmati and Dantiwada possess less potassium and sodium. • 172 sp of aquatic as well as terrestrial macrophytes were inventoried in the study. • 23 aquatic invertebrates, 61 zooplanktons, 59 butterflies and 102 sp. of spiders were found (inventory formed). • 30 sp. of fishes, 8 amphibians, 14 reptiles, 11 mammal sp. were fund. • Highest no. of bird sp were recorded from Kheda district. • 44 sp of breeding birds. • Kanewal, Pariej and Deo dam shows high potential to be considered as wetlands of international importance. 	<ul style="list-style-type: none"> • Degradation of wetlands due to the fact that they are been considered as wastelands. • Irrigation pressure on wetlands should be monitored/controlled. • Eutrophication should be checked by monitoring and enhancing agricultural practices in fringes. • Local people to be made stakeholders, part of decision making and aware about the importance of wetlands. • Traditional knowledge to be used to manage wetlands. • Ecological services given by wetlands need to be made understand to the local people. • Economic evaluation of wetlands in terms of ecological, tourism services provided should be done to enhance peoples view towards wetlands. • Protection status of important wetland areas to be enhanced (legally or through people's participation).

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
7	Preliminary study on mammals, raptors and grey hornbill in Sabarkantha region.	<ul style="list-style-type: none"> • Principal Investigator: Kunal Patel • Financial details: • year of start and completion: 2011 • remarks: complete • study area: Sabarkantha region 	<ul style="list-style-type: none"> • to make inventories of mammals and raptors • to study status of grey hornbill • Assessment of distribution and abundance across habitat types. • food habits of important sp. of mammals and grey hornbill 	<ul style="list-style-type: none"> • Enlisted 39 sp. of mammals from the reserve forest of Sabarkantha area of which 12 sp. of carnivores, 13 rodents, 1 sp. of insectivore, 6 sp of bat, 3 sp of herbivores, 1 omnivore and 2 sp. of primates • 20 sp. of diurnal raptors and 8 sp of nocturnal raptors. • 3 sp. of large owl, 2 medium owl and 1 sp of small owl. • prey predator ratio for small rodents and small carnivores was concluded to be 3:1/km • Only Nilgai was the successful herbivore in the area. • Grey hornbill was widespread and very common in north Sabarkantha forest division. 	<ul style="list-style-type: none"> • Palm civets, most bat sp, grey hornbills and raptors needs tall trees with larger canopy and fruit bearing capacity. • Tall heightened trees like <i>Madhuca indica</i>, <i>Terminalia bellerica</i>, <i>Terminalia arjuna</i>, <i>Syzygium heyneanum</i>, <i>Ficus bengalensis</i>, <i>Ficus racemosa</i>, <i>Syzygium cuminii</i> were observed to be the most important for roosting, nesting of raptors and grey hornbill. • <i>F. bengalensis</i>, <i>F. racemosa</i>, <i>F. religiosa</i> together fruits whole year thus giving sustainable whole year round food supply to frugivorous animals. • The study has identified Dholwani forest range as the most important biodiversity zone of Sabarkantha region.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
8	Evaluation and assessment of man animal conflict s with special reference to human injury and crop damage by wildlife in north Gujarat.	<ul style="list-style-type: none"> • principal Investigator: Dr. Nishith Dharayia • Financial details: • year of start and completion: 2009 • remarks: complete • study area: Vadodara, Anand, Kheda 	<ul style="list-style-type: none"> • find conflict prone zone in the study area and types of conflict • Evaluation of conflict and economic loss to local people. • suggest effective strategies to minimize conflict 	<ul style="list-style-type: none"> • Highest conflict zone in study area to be Banaskantha and Sabarkantha areas. • Lowest in Mehsana. • Highest conflict incidences during late evening and night. • Wild boar being the commonest wildlife conflict among all the 4 districts. Highest rate of livestock depredation in Sabarkantha region. • Blue bull chief crop raiding wildlife of whole area followed by wild boar. • Economic loss is most in Patan and Mehsana as their main occupation is agriculture. 	<ul style="list-style-type: none"> • Data based mapping of the conflict zones and mitigation accordingly. • Identification of major conflict species in the zone and mitigation of species specific type. • Crop insurance. • participatory approach of protecting wildlife by local people and in return providing them mitigation/ protection measures at subsidized rates (e.g. solar fencing) • ecotourism based employment provision • awareness • Quick and effective compensation packages.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
9	Evaluating the sloth bear status and distribution with reference to protected areas of Banaskantha forest.	<ul style="list-style-type: none"> • principal Investigator: Dr Tana Mewada & Dr. Amit Kotia research coordinator: Pradeep Khanna (IFS) • Financial details: • year of start and completion: 2012 • remarks: complete • study area: Banaskantha forest division 	<ul style="list-style-type: none"> • To determine current distribution status of sloth bear. • To identify ecological requirements in of sloth bear with sp. reference to food habits, den characters & other critical habitats for sloth bear. 	<ul style="list-style-type: none"> • Balaji Ambaji and Jessore WLS have highest sloth bear densities in whole of India. • Maximally used habitat was riverine forests in the study area. • Danta west range shows the highest number of encounter rate (maximum bear signs) with density above 10. • mainly frugivorous • <i>Cassia fistula</i> and <i>Ficus</i> sp. were found in bear diet whole year round. • <i>Syzygium cuminii</i> is preferred diet in monsoon • <i>Zizyphus</i> sp fruits important diet in winters. • <i>Madhuca indica</i> flowers and <i>phoenix sylvestris</i> fruits forms important diet of summers. • However distribution and density of these preferred species in the forest area are not sufficient. 	<ul style="list-style-type: none"> • Preparation of season specific preferred habitat of sloth bear on basis of its most preferred site habitat and most preferred vegetation of any bear dense forest area. • Provision of preferred trees through plantation etc. inside the forest areas. • Checking habitat loss of the most preferred habitats of the bears. • Conservation strategies of the particular area of bear should be based on sloth bears ecological requirements rather than general. • Sloth bear distribution map for whole state and conservation strategies accordingly. • Habitat improvement with specific focus on sloth bear in sloth bear dense areas. • high density areas near human habitation of sloth bear should be well equipped with rescue skills and equipment •

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
10	Ecological study on the Great Indian Bustard Sanctuary, Kutchchh: A Management perspective.	<ul style="list-style-type: none"> • Principal Investigator: Prof. Y.D Singh and Dr. Justus Joshua Gujarat institute of desert ecology. • Financial details: • year of start and completion:2001 • remarks: complete • Study area: The Great Indian Bustard Sanctuary, Kutchchh. 	<ul style="list-style-type: none"> • to document the population status and habitat use of GIB • Quantify the associated flora and fauna of lala bustard sanctuary. • To know existing threats and their impact on the grassland and its keystone species. • to map the grassland and land use pattern around sanctuary • suggest management recommendation of LBS. 	<ul style="list-style-type: none"> • Highly habitat specific. Thus can be taken as the keystone species of grasslands. • Whole of the sanctuary is been effectively used for the purpose of grazing and grass collection. • Sanctuary was found poor in terms of harboring herpetofauna which are the best indicators of the health of the ecosystem. • The southern portion is richer in shrubs species, small insect species richness and their abundance than the northern part. • LBS supports 2 sp. of endangered birds, GIB and Lesser florican. • Maximum of 4 GIB were sighted inside LBS. • Majority of GIB were found in grassland outside the LBS. maximum of 18 individuals was sighted at one time. • No GIB was seen throughout the year thus indicating that GIB are local migrants/ nomadic. • It requires a large area for the territory at least a minimum of 2 km². • GIB prefers area with less human intervention for nesting and incubating. • GIB prefers flat area with short grasses. • 5 breeding mosaics were identified in whole area inside and outside of the sanctuary. 	<ul style="list-style-type: none"> • Need to divert the grazing pressure at least during breeding season (march-sept). • Proper study of association of livestock dung and presence of more GIB should be done. Otherwise conservation steps such as total ban on grazing by livestock can adversely affect GIB. • Spread of prosopis and other intruding woody plants should be properly and thoroughly restricted so conserve the grassland habitat. • Cultivated land inside the sanctuary must be acquired on compensation basis. • Bunds of water wholes need to be flattened to act as elevation points for GIB to display. • Prosopis plantation need to be totally eradicated. • Area of LBS is not sufficient for even a single male territory thus expansion is the need of the hour. • Acacia nilotica can be

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
		<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • GIB were found in the places where cattle/ goat sheep dungs were present due to more availability of insects in there. • Surrounding villages depends highly on the grasslands also used by GIB. • Land use pattern identified 3 potential grasslands: lala, Vingaber, Air force and thus giving scope of extension of the sanctuary. • 	<ul style="list-style-type: none"> • Hidden water holes in the five breeding mosaics as per construction details given in the study. • Radio telemetry study should be conducted for better understanding of home range, spatial and temporal use of habitat, breeding behavior, nesting ecology, factors affecting survival and dispersal of chicks and threats faced by them. • Regular monitoring census for GIB and lesser florican annually and fortnightly (during breeding season to see whether breeding number and breeding success. • Local people should be made aware of the importance of GIB. • 3 breeding mosaic (of 400 ha each (one on North West side near GEDA plantation, one on the southern side) in Vingaber and 2 breeding mosaic of 400 ha in grasslands behind Air Force must be included in the sanctuary. • Strict protection should be

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
11	Exploration of biodiversity of Insect fauna in important forest tree of Dangs district.	<ul style="list-style-type: none"> • principal Investigator: Dr. Sushil Kumar P. Saxena • Financial details: • year of start and completion: 2012 • remarks: complete • Study area: dang district (north & south). 	<ul style="list-style-type: none"> • To explore the insect fauna causing damage important tree crops of dang dist. • To study seasonal incidence of important insects - pest and their natural enemies in relation to weather factors and crop phenology. • To assess the economic losses caused by important insect-pest. • Development of integrated or non-pesticide or biological pest management models. 	<ul style="list-style-type: none"> • Incidence of trunk borer in teak was highest 85% in dang north during May, in <i>shisham</i> highest in n. dang during April. The period from December to May was the main active period, in Khair was highest in dang south. Major activity period was February to May, in Palas was highest during April and may in S Dangs and major activity period is January to May. • incidence of foliage pest in teak was highest in dang north during September, in shisham highest in S. dang during September the period from January to May was the main active period, in Khair was highest in dang south during august major activity period was august to October, in Palas was highest during September in N. Dangs and major activity period is July- November. • pest of primary branches of teak peak in may in S dang, in Shisham peaks in may in N Dang, in Khair peaks in may in S Dang • In forest nursery on teak seedlings on teak seedlings, Foliage pest highest in August, Shisham seedlings highest in August Khair highest in august, Palas during July. 	<ul style="list-style-type: none"> • Proposed a study of 10 years on abundance of foliage, trunk and surface feeder of imp tree sp. to highlight the seasonal and geographical distribution so that hot spot areas of these pest can be identified. • biological or natural enemies includes <i>Apanteles sp.</i> a larval parasitoid of defoliators like skeletonizer, <i>Xanthopimpla sp.</i> and <i>Branchymeria sp. a pupal parasitoid</i> if mass multiplied and released in the fields can result in biocontrol.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
12	Diagnosis and treatment of captive and wild animals of Gujarat state	<ul style="list-style-type: none"> • principal Investigator: Dr. R.G Jani • Financial details: • year of start and completion: • remarks: complete • Study area: different zoo. 	<ul style="list-style-type: none"> • To provide diagnostic help and treatment facilities to Zoo and wildlife. • To provide histopathological and P.M findings from submitted biomaterials to lab. • To investigate for serological diagnosis. • To undertake the specialized test on biomaterial provided from wildlife. 	<ul style="list-style-type: none"> • Rajkot Zoo was found to have highest mammals with parasitic loadout of 546 wildlife fecal samples, 73 found positive. • High morbidity in spotted deer in Sakkarbagh Zoo which were tested positive for parasitic load and T.B. • Pneumonia followed by toxemia were recorded as most common cause of mortality in various sp. • Pulmonary TB and hemorrhages were highest in cervidae and antelopes. 	<ul style="list-style-type: none"> • Need of a long term and extensive health care program. • Establishment of niche center of excellence for wildlife health care and management. • A contiguous financial support to veterinary universities to carry such program continuously. • Establishment of a state of art diagnostic and treatment facility in coordination with the veterinary university to carry such diagnostic and monitoring program.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
13	Strengthening of disease diagnostic facilities of captive and wild animals of Gujarat state.	<ul style="list-style-type: none"> • principal Investigator: Dr. R.G Jani • Financial details: • year of start and completion: 2012 • remarks: complete • study area: 	<ul style="list-style-type: none"> • To strengthen disease diagnostic facilities of zoo & wild animals. • To provide histopathological & PM findings from submitted biomaterials. • To attempt detection of possible major pathogens of captive /wild animal. • To investigate serological diagnosis. • To undertake the specialized test on biomaterials from wild animals. • Diagnosis of T.B in captive small wild ungulates. 	<ul style="list-style-type: none"> • Eastern Gujarat shows highest positive fecal sample for parasitic load. • among zoos, Vadodara zoo followed by Rajkot and Indroda zoo shows the highest parasitic load positive fecal samples • Among parasites, protozoan cyst were the highest. • In Zoo pigeons are the highest infected sp. in terms of parasites. • Among zoo mammals, leopard were reported with highest parasitic infection (Spirometer spp.) followed by lions having ancylostoma and spirometra spp. • In histopathological analysis, highest found case was of pneumonia followed toxemia. • Highest no. of death due to T.B were of spotted dears. 	<ul style="list-style-type: none"> • Prevention of overcrowding in deer to prevent spread of T.B and stress causing pneumonia and toxemia. • Strict monitoring protocol for lions and leopard for parasitic load in captivity as heavy parasitic load immunocompromised the animal and they become prone to various other infections/ disease. • Spirometra being the highest infection in feline sp. need to be strictly controlled. Like infestation of feed/food with rodents. • Wolves in captivity were found to be infected with Trypanosoma spp. • Proper hygienic condition to be maintained especially of place where feed are prepared. • Supplementation of vitamins and mineral along with the feeds. • Deworming and vaccination protocol for different sp. against most widespread and dangerous disease agents. • Proper designing of the

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
14	An ecological study of Kutchchh mangroves and its associated Fauna with reference to management and conservation.	<ul style="list-style-type: none"> • Project coordination: Prof. Y.D Singh principal Investigator: Dr. G.A Thivakaran • Financial details: • year of start and completion: 1998 • remarks: complete • Study area: N-W Kutchchh from Mundra to Kori creek. 	<ul style="list-style-type: none"> • To identify and assess critical mangroves of Kutchchh coast. • Study physiochemical characteristics of mangrove habitat. • To document faunal/floral diversity of the mangroves. • To study pressure and eco catastrophic activity of boring and fouling organism in mangroves. • Suggesting management strategies for mangrove habitat. 	<ul style="list-style-type: none"> • Mature tree density in study areas decreased in order of Kori-Jakhau-Mundra-Medi-Laki post. • minimum mean canopy density at Bet island of Jakhau and maximum at Laki creek • Density of regeneration class was found higher than the recruitment class in whole study area. • Highest salinity was recorded at Kori creek and lowest at Mundra. • Mundra and Jakhau reported with highest anthropogenic pressure (cutting and lopping of trees). • Borer attack was limited to dead and decaying and was highest in Kori creek and lowest Jakhau. • 	<ul style="list-style-type: none"> • Plantation of selected native species to help restore depleting habitat. • Standardization of nursery practices for selected sp e.g. <i>Creiops tagal</i>, <i>A. officinalis</i>, <i>Aegiceras corniculatum</i> and <i>Rhizophora apiculata</i>. • awareness • Development of ecotourism. • Monitoring and developmental impact in these mangroves. • Formation of a state level mangrove management committee for promotion and conservation.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
15	Occurrence, distribution and status of small and certain rare species of mammals in central Gujarat.	<ul style="list-style-type: none"> • project coordinator : Dr. Diwakar Sharma • Financial details: • year of start and completion: 2006 • remarks: complete • Study area: districts of Vadodara, Panchmahal and Dahod. 	<ul style="list-style-type: none"> • Occurrence, distribution and status of small and certain rare species of mammals including Rusty spotted cat, Ratel, Common palm civet, Pangolin and Flying squirrel. • To make qualitative assessments of habitats for such sp. • To find out habitat preference of such species and improvements. • Species and area specific management strategies. 	<ul style="list-style-type: none"> • 13 species of small mammals were recorded in study area. • Felidae and viveridae family had highest sighting and distribution. • Habitat used by these species includes mostly agricultural land and forest area. • Jungle cat was widespread in distribution. • First report of rusty spotted cat from central Gujarat. The species uses same habitat as that of jungle cat but uses late night hours than jungle cat • Palm civet found more in the habitat with good tree density and fruit yielding trees. • Long eared Hedgehog reported from northern part of central Gujarat which is an indicator sp. of desert influence. • Road kills were very high for small mammals. 	<ul style="list-style-type: none"> • Habitat identification according to species which is present and improvement accordingly e.g. for palm civet more fruit trees, for smooth skinned otters conservation of rocky boulder riverine areas. • Protection measures for otters and porcupines. • 5 important areas identified outside conserved areas having promising number of these wildlife are : • Around Kadana dam near Mahi river: (hedgehog area) improvement by green cover of zizyphus and fruit trees.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
		•	•	•	<ul style="list-style-type: none"> • area between forest tract of Sarjumi and Sant road (important area of jungle cat, rusty spotted cat): control of night traffic by innovative signage, speed breakers constructions • Area 4 is the lower section of Mahi River and ravines along the stretch (important for smooth Indian otters): safeguard from upcoming developmental projects. • Area 5 Jambughoda WLS: wildlife mostly found outside the protected area. Hence improvement of habitat inside and increasing awareness outside.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
16	Occurrence, distribution and status of small and certain rare species of mammals and certain rare species of mammals in Saurashtra.	<ul style="list-style-type: none"> • principal Investigator: Yogendra Shah Financial details: • year of start and completion:2010 • remarks: complete • study area: 	<ul style="list-style-type: none"> • Occurrence, distribution and status of small and certain rare species of mammals and certain rare species of mammals in Saurashtra region • Study on ecology of desert fox in little Rann of Kutchchh. 	<ul style="list-style-type: none"> • Most of the lesser carnivores viz. Wolf, Jackal, Hyena, Ratel avoid contact with human habitation. • Most common food in urban areas for foxes was scavenged items. • Desert fox breeds during winters as food is abundant (arthropods, small birds and rodents). • Highly adaptability of desert fox to bear extremes of temperature and habitat conditions. • 	<ul style="list-style-type: none"> • Habitat improvement should be species specific. • Threats to these species to be identified and dealt accordingly. • Not much recommendation/ suggestion provided/possible from the study.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
17	Occurrence, distribution and status of small and certain rare species of mammals and certain rare species of mammals in north Gujarat region.	<ul style="list-style-type: none"> • principal Investigator: Dr. Nishith Dharayia Financial details: • year of start and completion: 2006 • remarks: complete • Study area: districts of Banaskantha, Mehsana, Patan and Sabarkantha. 	<ul style="list-style-type: none"> • analysis of soil and water quality in respect of wildlife • Analysis of vegetation diversity & habitat preference & threats. • study of status & distribution of small & rare mammals • identify & analyze threats • Conservation & management recommendations. 	<ul style="list-style-type: none"> • The region of north Gujarat was stratified in 4 zones. • Reported 27 sp. of mammals out of which 23 sp were of medium to small sized. • as per direct encounter rates, 25% species among the reported ones are common in entire region and 48% species are very rare in the study area (may be due to being nocturnal & thus less encounters). However sign index reveals that most mammals have fair distribution in various habitat. • Indirect/direct evidence of Desert cat, Ruddy mongoose and Hyena were very low suggesting them to be rare in occurrence in these areas. • 27% of the small mammalian species reported from the study area, are living in high threat areas, 15% low threat and 57% in minimal threat areas. • developmental activities, irresponsible tourism, overgrazing, mining, lopping & cutting etc. are major threats • Highest impact score of threats was of cutting/lopping & tourism/pilgrimage, followed by grazing/fire/mining/transport. Least impact was of encroachment. 	<ul style="list-style-type: none"> • Rarest sp. are recorded from the habitat (open scrub forest and arid saline deserts) with highest threat. thus these areas to be identified for species specific conservation • Highly habitat specific animals like Desert cat, hedgehogs need species based conservation measures with detail study of their behavior and needs, so that conservation strategies can be prepared. • A regular monitoring census of the rare endangered species at local departmental level to keep an eye on their presence. • Conservation corridor between Jessore WLS and Balaram Ambaji WLS. • Training & skill development of frontline staff to monitor small rare mammals through sign index. • Increase limit of Balaram-Ambaji sanctuary up to Dante based on presence of rare endangered mammals.

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S. N O	RESEARCH TOPIC	MISCELLANEOUS	OBJECTIVES	IMPORTANT FINDINGS	RECOMMENDATIONS/ SUGGESTIONS
		•	•	•	<ul style="list-style-type: none">• Protection of habitat integrity especially between riverine habitats with their adjacent wetlands and other riverine areas.• assessment to be done of current cutting/lopping