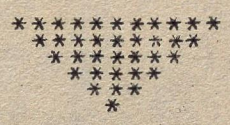
-:: IMPORTANCE OF GIR ECOSYSTEM ::-

Gir with it's spread of 14 12.13 Sq. Kms. in Saurashtra Peninsula is a single compact and largest Forest Ecosystem of westers India, 64.338 Sq. Kms. of Saurashtra Peninsula, jutting out in the Arabian sea between the Gulfs of Kutch and Cambay (Khambhat) experiences Tropical monsoon climate. Though geogra--phically it is placed in the way of south-west monsoon; more often than not; is missed by monsoon winds. Thus major part of Saurashtra is either arid or semi arid and on an everage, experiences drought or scarcity once in three years. Geologica--lly, it is formed of volcanic Traps, Trappean Grits, Sand stones and Lateritic Bocks. Topographically it has not a centra--lly raised land and plains along the coastal areas, thus having drainages in all directions. Based on Geological formations, Black Cotton Clayee soil, Red Brown sandy loam soil, and red lateritic soils are commonly observed and in many districts it is generally shallow in depth .

Distinct three seasons, i.e. summer, monsoon and winter; Arid to semi Arid claimatic conditions and shallow soil gave rise to vast stratches of grass lands and few pockests of scrub, savanah and dry deciduous forests within the folds of hill systems. Grass lands were first used by pestesalists and gradu--ally they took to plough and converted these grass lands in to rain fed Agricultural land. Advanced Agricultural Technology followed and dry farming is converted in to wet farming by incre--asing irrigation facilities, mainly using ground water. This has it's own fall outs in the form of increasing ingress of salinity from coastal areas. Economic pressues resulted in to denudations of hill slopes, folds and valleys by continuous deforestation activities, and resulted in to the loss of what--ever precipitation is received; mainly in the form of run-off andit reduced the quantum of recharge to the ground water.

Placed in this set up, Gir Forest Ecosystem has treman--dous ameliorating values for the Saurashtra Region. Besides, it provides suitable and safe habitat for rare and endengered wild animals like Asiatic Lion, Marsh Crocodile, Pythons, Panthers,

Pangolin, Honey badger, Rusty Spotted Cat, Sambars, etc. It also provides suitable breeding niche and winter home to many migra--tory birds. Most important aspect of this ecosystem is that it has got tremandous intrinsic self supporting and evolutionery power due to its rich and diverse fauna and flora. The note attached herewith gives information about the Gir Ecosystem and it's management.



A NOTE ON GIR LION SANCTUARY & NATIONAL PARK AND IT'S MANAGEMENT

INTRODUCTION :-

Gir wildlife Sanctuary and National Park, with the last surviving population of Asiatic Lion - Panthera Leo persica is one of the largest compact tract of forest system in the region. Despite the symplicity of vegetation types, the Gir exhibits tremandous diversity of flora and fauna with very many interactions of these diverse species and their environment, it has become a very stable system, capable of withstanding natural calamities like several drought and cyclones.

The Asiatic Lion once roamed many forests and open grasslands from Turky to central India. Onslought of human pressure resulted in to shrinking of Lion's habitat and now what remains with us is the Gir, extending on 1412.13 Sq. Kms. as the last refuge of this important carnivore.

LEGAL STATUS :-

Of the 1412.13 Sq.Kms. of Gir Forests, 1154.42 Sq.Kms. periferial area is Sanctuary and the 258.71 Sq. Kms. of core area is the National Park.

LOCATION AND TOPOGRAPHY :-

Gir lies between 20°-40' North and 21°-50' North lati--tudes and 70°-50' East and 71°-50' E longitudes . The land confi--guration is mainly hilly with moderate hills valleys and pla--teau, without difinite direction of hill ranges. Northern parts are more hilly, where as South western parts are relati--vely less hill, with general drainage direction being South and South West.

GEOLOGY, ROCK, AND SOIL :-

The hills are of volcanic origin. The main geologi--cal formation is Deceantrap and main rock types are Dolomite and Basalt. Besides, sand stones, Lime stones and metamorphic schist are also present, voleanic rocks have given rise to the Black cotton- soil and sand stones and lime stones have given rise to redish brown sandy loam soil. Soil texture varies from gravely along the river banks and clayee in deep valey .

CLIMATE ::-

Gir enjoys the tropical monsoon climate, which is very hot during the summer, Four seasons viz. Summer, Winter, monsoon and post monsoon are distinct. Late November to early March is the cool dry season followed by hot dry season till mid June. The temperature drops down to about 10° C in winter and rises to about 43° C in summer Mid June to September is the monsoon and the bulk of precoptation is received during July and August. Rainfall date of past 28 years recorded at Kamleshwar in the West and Raval dam in the East show that average rainfall is 1000mm and 800mm respectively.

WATER RESOURCES ::-

Gir forms the catehment of Seven principal rivers viz. Hiran, Saraswati, Datardi, Shingauda, Machhundri, Godavadi and Raval. Northern Aspect of Northern ridges form catehment of Shetrunji, outside sanctuary area. All these major rivers of Gir have perenial water supply except during seven famine years. During peal summer, surface water for wild animals is available at only about 300 water points. During drought years surface water is not available even in the majority of these points.

VEGETATION ::-

Gir vegetation is fairly homogenous, nearly 70 % of Gir area is dominated by Teak (Tectona grandis) and its several associates. Remaing 30 % of Gir area is covered by various vege--tation types including Tropical thorn Forests, interspersed with patches of dry deciduous forest . Thorn bush land and degradatio--nal stages of dry Deciduous Forests. The vegetation changes on west to east axis and in extreem eastern portion the Teak is repl--aced by Dhavda (Anogeisus latifolia).The vegetation of the following types according to the champion and seth classification (1968) of forest types of India

(1) DRY DECIDUOUS FOREST ::-

(A)	Dry Teak Forest	(5A/C1)	
(B)	Dry mixed Forest	(5A/C2)	
(C)	Babul Forest	(5A/E3)	
(D)	Riverine Forest	(5I/S1)	
(E)	Dry Savanah	(5/DS1)	} Degradational stage
	Dry Scrubland	(5/DS2)	}

(2) THOPICAL THORN FOREST (6A) AND

its degradational stage i.e. Thorn scrubland.

A revised classification of habitat types has been prepared keeping in view the biological and managerial aspects of herbivare population. The following are the eleven habitat types:

(1) Riverine
(2) Thorn wood land
(3) Teak, Acacia, Zyzyphus wood land
(4) Anogeisus Acacia Zyzyphus wood land
(5) Pure Teak wood land
(6) Mixed valley community
(7) Mixed Teak wood lands
(8) Deciduous wood land (West)
(9) Deciduous wood land (East)
(10) Thorn Savanah

GENERAL FLORASTIC ::-

(I) Tectona grandis, Terminalia crenulala, Diospyros-melanaxylon, Garuga pinnata, Lannea coromandalica, Albizia procera, Albizia lebbexk, Acacia senegal, Adina cordifolia, Mitragyna parvifolia, sterculea urons, Boswellia serata, Schleichera cleosa, Pterocarpus-marsupium, Dalbergia latifolia, Holoptelia integrifolia Eagle mamelos, Syzygium cuminii,

(II) Acacia nilotica, Acacia catechu, Acacia leucophloea, Acacia feruginea, Acacia planifron, Morinda tomentosa, Xeromphis uliginosa, Holorrhena antidysentrika, Manilkara hexandra, Soymida febrifuga, Ehretia laevis, Wrightia tinctoria, Bridelia retusa, Bauhinia racemosa, Casia fistula, Phylanthus embica, Pongamia pinnala, etc.

(III) Balenitis aeguptica, Capparis sepiaria , Carissa-carandas, Zyzyphus nummularia, Zyzyphus ofnolia, Gymnosporea montana , Helecteris isora, Grewia-tilifolia, Dichrostachys senerea .

(IV) Achyranthus aspera, Clerodenron miltiflorum, Aerva-persica, Sida orientalis, Sida spinosa, Woodforlia - fruticosa, Pupalia lappacea, Barleria prionitis, Neurocanthus pyrostachys, Abutilon glaucum, Boerhavia-Chinensis, Indigofera oblongifolia, Triumfetta - rotundifolia, etc

(V) Cooulus pendulas, Cissampelos pareira, Mucuna prurita, Tinospora cordifolia, Cissus repaoba, Holostemoma- - annulare, Combretum avalifolium, Celastrus paniculata Coculus hirsuta.

THE FAUNA ::-

The unique ecosystem of Gir harbours about 31 species of mammals, 300 species of birds atleast 24 species of reptiles and such more than 2000 species of insects.

MAMMALS ::-

(1)	Asiatic Lion	Panthera leo persica
(2)	Panther	Panthera perdus
(3)	Stripped Hyena	Hyaena hyaena
(4)	Wolf	Canis lupus
(5)	Jackal	Canis qureus
(6)	Indian Fox	Valpes bengalensis
(7)	Jungle Cat	Felis chaus
(8)	Desert Cat	Felis lybica
(9)	Rusty Spotted Cat	Felis rubiginora
(10)	Small Indian Civet Cat	Viverricala indica
(11)	Ratal or Honey Badger	Mellivore capensis
(12)	Indian Pangolin	Manis crassicaudata
(13)	Crested porcupine	Hystrix indica
(14)	Pale Hedgehog	Paraechinus micropus
(15)	Sambar	Cervus unicolor
(16)	Spotted deer or Chital	Cervus axis
(17)	Chinkara or Indian gazelle	Gazella gazella
(18)	Nilgai or Blue bull	Boselaphus tragocamelus

(19)	Four horned antelope or	Tetracerus quadricornis
(20)	Wildboar	Sus scrofus
(21)	Hanuman langur	Presbytis entellus
(22)	Indian Hare	Lepus nigricollis
(23)	Ruddy mongoose	Herpestes smithi
(24)	Small indian Mongoose	Herpestes auropunctatus
(25)	Common Indian Mongoose	Herpestes eduardsi
(26)	Five striped palm squirrel	Funambulus pennanti
(27)	Indian gerbil	Tatera indica
(28)	Field mouse	Mus booduga
(29)	Roof Rat	Rattus rattus
(30)	Musk Shrew	Suncus murinus
(31)	Flying fox	Pteropus giganteus
(32)	Short nosed fruit bat	Cynopterus sphink

REPTILES :-

(1)	Mugger or Marsh Crocodile	Crocodylus palustris
(2)	Flap shell Turtle	Lissemys punctata
(3)	Starred Tortoise	Geochelone elegans
(4)	Northern House Geck	Hemidoctylus flaviviridis
(5)	Banded Geck	Cyrtodactylus kacchensis
(6)	Common Garden Lizard	Calotes versicolor
(7)	Fan Throated Lizard	Sitana Ponticeriana
(8)	Indian Chameleon	Chamaeleon zeylanicus
(9)	Common Skink	Mabuya carinata
(10)	Snake Skink	Riopa punctata
(11)	Common Monitor Lizerd	Varanus bengalensis
(12)	Common Sand Boa	Eryx conicus
(13)	Red Sand Boa	Eryx johni
(14)	Indian Python	Rython molurus
(15)	Trinket Snake	Elaphe helena
(16)	Common Ratsnake or Dhaman	Ptyas mucosus
(17)	Bronzeback Tree Snake	Dendrelaphis tristis
(18)	Common Wolf Snake	Lycodon aulicus
(19)	Checkered Keelback	Xenochrophis piscator
(20)	Buffstriped Keelback	Amphiesma stolata
(21)	Common Indian Krait	Bungarus caeruleus
(22)	Indian Cobra	Naja naja
(23)	Russells Viper	Vipera russelli
(24)	Saw scaled Viper	Echis carinatus

CENSUS DATA ::-

Sr.No.	Name of the Animal	No.of Animal as per census			
		1974	1979	1985	1990
(1)	Lion	180	205	239	284
(2)	Panther	155	161	201	212
(3)	Hyaena	74	84	192	97
(4)	Chital (Spotted deer)	4517	8431	10466	8085
(5)	Sambar	707	708	772	404
(6)	Blue bull	1528	2036	2031	771
(7)	Wild boar	1922	2036	2212	505
(8)	Four Horned Antilope	378	1042	1063	76
(9)	Chinkara	165	330	331	337
(10)	Monkeys	3938	6958	6912	2567

MANAGEMENT OBJECTIVES ::-

(1) To protect and conserve Gir Forest Ecosystem.

(2) Saving Asiatic Lions from extinction.

(3) To conserve soil and moisture.

(4) To amelecrate environmental conditions.

(5) To support research and studies.

(6) To impart Nature Education.

(7) To assist tourists.

(8) To help reducing damage caused by human dependance on forests.

(9) Economical and social upliftment of maldharies (Cattle keepers) and villagers of in-forest settlement.

ORGANISATION ::-

PRINCIPAL CHIEF CONSERVATOR OF FORESTS

CHIEF CONSERVATOR OF FORESTS
WILD LIFE GUJARAT STATE

Conservator of Forests, Wild Life Circle, Junagadh	Conservator of Forests, Wild Life Circle, Vadodara	Director Marine National Park.
(Wildlife protection areas of Saurashtra and Kachhchha)	(Wildlife protection areas of North Gujarat and South Gujarat)	

(Other Sanctuary & National Park.

GIR WILD LIFE SANCTUARY AND NATIONAL PARK

Gir (West) Forest Division Junagadh	Gir (East) Forest Division Dhari	Wildlife Division Sasan-Gir,
-- 9 Ranges	-- 6 Ranges	-- Sanctuary Range
-- 32 Rounds	-- 23 Rounds	-- Guest House Range
-- 97 Beats	-- 42 Beats	-- Reception Range

FUNCTIONS ::-

Protection, execution of works, and implementation of management policies.	Welfare of fauna, management oriented research, Nature Education, Tourism.

PROBLEM IDENTIFICATION ::-

Problems identified in 1969-70 (Guy mountfart paul Joslin)

(1) Progressive and accelerating degeneration of indigenous ecosystem.

(2) 21000 domestic live stock grazing within the sanctuary, and this number getting doubled or trebled during the dry season.

(3) Wild ungulates became rare or disappeared from the sanctuary due to loss of grazing and brouging to domestic livestock.

(4) Most of the fertile valley in the sanctuary have now been cultivaled. This loss of wild life habitat is still proceeding.

(5) Few large trees now remain in the sanctuary.

(6) Large quantity of grass fodder are removed from the sanctuary.

(7) Though the sanctuary was created (1963) primarily for the protection of the last surviving Asiatic Lions, population declined from an estimated 285 in 1963 to 177 (1969).

(8) In the absence of their natural prey, the lions feed almost exchesively on domestic livestock.

(9) About 20 % of the Lion population is given tethered domestic buffaloes during the dry season, as a specta--cle for tourists.

(10) Reduction from a once well balanced forest community rich in wild life to an impoverished, artificial and heavily exploited area.

MEASURES TAKEN :-

1. Strengthening of protection measures.
2. Construction of Rubble wall fencing To check ingress of outside cattle. } 1972-1974
3. Resettlement of maldhari families and shifting out their live stock. } 1972-1976
4. Identifying the core area and declaring it (1975) National Park.
5. Suspending Timber felling activities.
6. Payment of compensation in case of live stock killing by lions.
7. Strengthening check posts to control movement people and live stock within the sanctuary.
8. Regulating trafic on public high ways passing through the sanctuary. (1980-1987)
9. Organisational restructuring meeting administrative and managerial needs (creation of more Ranges).(1983)
10. Further strengthening protection measures by introducing wireless communication network, petrolling vehicles, and wepons. (1983-1985)
11. Nature education and mass movements through Forest Youth Club and other voluntery organisation.(1983 onward)
12. Launching of individual benificiery scheme.
13. Assisting wild animals in scarcity years.
14. Employment Generation Programme, perticularly during scarcity years.

RESULTS ::-

(1) Increase in Lion population from estimated 177 in 1968-69. to 180 in 1974, 205 in 1979 and 239 in 1985.

(2) Increase in other wild animal population including wild--ungulates (e.g. Chital population from 4517 in 1974 to 10466 in 1985).

(3) Habitat improvement, increase in cover, and grass and brows availability.

(4) Reduction in fear complex in wild animals leading to effective breeding.

PRESENT PROBLEMS :-

(1) Encroachment on the borders.

(2) Domestic live stock of remaing maldharies competing with wild ungulates.

(3) Trafic on remaining public highways and railway line.

(4) Illicit cutting and poaching to some extent.

(5) Religious places within the sanctuary area with ambitions expansion plans.

(6) Weed infestation.

(7) Alternate home for lions.

(8) Wild herbivores damaging Agricultural crop.

(9) Lions going out of sanctuary area.

(10) Wild Life area versus human needs, interface conflicts.

STEPS BEING TAKEN AND PROPOSSED SOLUTIONS :-

1. Constant vigilance is being kept to check encroachment. Existing survey staff deals with the problem by identi--fying encroachment and removing the same. As the existing facilities, are not sufficient and unavoidable litiga--tions take long time, the work is not very effective. Boundary wall helps in identifying demarcation line. An efficient scheme of encroachment identification and removal is being propossed to be taken up in the 8th Five Year Plan.

2. A revised maldhari rehabilitation scheme has been prepa--red and is being propossed to be taken up in the 8th Five Year Plan.

3. The matter is being taken up with the Government and other departments. On one of the important state highway passing through the sanctuary and National Park.Heavy trafic and Night trafic has already been banned, since April-1988.

4. Continuous patrolling, Nakabandhi and Vigilance works are done. Strengthening of protection facilities is being done by introducing more wepons, and VHF Walky--Talky sets. New check posts are being propossed in the

8th plan.

5. Sanctuary rules and regulations are applied to the religious places. Steps are being taken for not allowing new rights and privileges.

6. Every year weed eradication operations are carried out However, there is a need to accelerate the work and hence increased facilities are propossed for the next plan.

7. The problem of finding alternate home for lions is a subject of intensive study. Research projects propossed for the next plan may take up this topic of study.

8. At present problem of wild ungulates damaging agricul--tural crop is not very serious. It is generally related to the fodder availability within the sanctuary and surfaces out only during scarcity or drought years. Habitat manipulation works like thinning in dense woody growth and lopping of brows spp. to increase brows availability. where over necessary is propossed for comming annual and five year plans.

(9) Lions going to human habitation areas and that too, as far as 20 to 25 kms away from the sanctuary limit is not the recent phenomina. However, because of the increased interaction with human being for the obvious reasons of population increase, people disturbing lions, etc. incidents of lion injuring people have increased. Mass education through public appeals, mature education camps, extension activities in rural area etc. activities have already been taken upto reduce unpleasent human lion interaction.

(10) For reducing wild life human need interface conflict following steps are taken.

(i) Individual benificiery scheme supply of fuel wood at concessional rate.

(ii) Allowing grass collection from the fringe areas of sanctuary during the good years.

(iii) Supply of storred grass during the scarcity years.

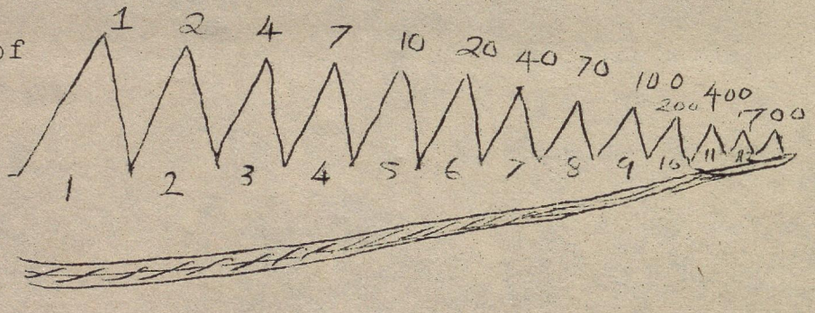
(iv) Launching employment generation schemes.

(v) Eco-development works are being propossed for the next five year plan including energy and fruit tree planta--tions, fodder development, drinking water facility development, Animal husbandary facilities, emmunity belt etc.

NOTES ::-

CROCODILE REARING CENTRE ::-

Mugger or Marsh crocodile were abundant in entire Saurashtra till recent past. They became endangered mainly due to its hunting for the leather. With a view to restore their population crocodile rearing centre in 1976-77 at Sasan. Crocodile eggs are collected mainly from Hiran-1 (Kamleshwar) Dam during May-June and are hatched artificially at the centre. Average clutch size is 40 eggs per nest. Incubation period is 40 to 50 days. Young once are reared for 3 to 4 years, and are released when they grow beyond 90 cms in length. They are released in various dams inside the sanctuary area. Since 1986-87, system to mark serial numbers to individuals before releasing them. Numbers are marked by cutting the scoups of the tail as below :-



Every individual is measured weighed and sexed before the release.

INTERPRETATION PARK DEVALIA ::-

Earlier lion shows were being arranged for the benefits of tourists, visiting gir. However, this practice was found to be cumbersome and deleterious for the lions and the staff. Therefore, no lion shows are being arranged now. At present gir sanctuary and National Park is not devided into various zones, and there is no definite tourism zone. However, to reduce disturbance from tourism in the main Sanctuary & National Park area and to facilitate tourists for understanding gir and its Wild-Life, an interpretation park has been created at Devalia. The interpretation park comprises 412 hacts of chainlink fenced lion habitat. It is also provided with a feeding cum leafing cage

for carnivores and a double gate entry points. At present there are about 40 to 50 Wild spotted deers and a few wild nilgais in the park. Besides four lionesses, three black-bucks and a few nilgais from zoo have been introduced in the park. Introduction of a few more captive animals of wild species is under consideration.

NATURE EDUCATION ::-

It is the public opinon which helps the conservation movement on a long tun. Therefore several public awareness programmes have been taken up by the forest department of which organising Forest Youth Clubs and its activities, and educating young people about the nature & nature conservation through the nature educating camps are the two prominent activities. There are about 25 active Forest Youth Clubs in the Junagadh District. Wildlife Division Sasan organises 20 nature education camps in a year , imparting awareness among about 1700 perticipants. During the month of November 1988, Advanced trainers camps were conducted with an objective to train nature conservation enthusiast for developing capabili-lities to organise Nature Education Camps.

Year	Camp	Participants including teachers.
1988-89	43	1197 + 516 = 1713
1989-90	36	1241 + 257 = 1498
1990-91 (Plan)	31	1200 + 124 = 1324