

DIRECTORY OF NATIONAL PARKS AND SANCTUARIES IN
GUJARAT
Management Status And Profiles

[DRAFT]

Environmental Studies Division
INDIAN INSTITUTE OF PUBLIC ADMINISTRATION
New Delhi
1990

Present Day Postscript

A decision was taken, in consultation with Ashish Kothari, one of the editors, to electronically publish this draft directory of national parks and sanctuaries in Gujarat, along with the finalised directories of some other states. It was specifically decided to leave-in the marginal comments of the various reviewers, mostly Ashish Kothari, the late Pratibha Pande, and Farhad (Bingo) Vania, so that the information available was as authentic as possible, and all the doubts and queries explicitly listed. The decision to include these scribbles was also made in consultation with Ashish, though he did specify that I needed to verify that no one had made any rude comments. This involved my having to read and decipher each of the comments, many of them in pencil and faded over time.

I am relieved to report that I only found one rude comment, that by Farhad (Bingo) Vania, who, at the foot of page 66, encircled the names Ashish Kothari, Pratibha Pande, Shekhar Singh and Dilnavaz Variava, mentioned as a part of a citation of an earlier publication, and remarked “Not again !”. Though his remark was in pencil and had somewhat faded over the last thirty years, it had not lost its significance, and I have retyped the words under the hand written comment – so that they are easy to read.

In fact, in many places where, in the scanned version, the hand writing was too faded to read easily, I have retyped the original hand written remarks, leaving the handwriting as it is, in order to retain the historical flavour.

While scanning this manuscript, we found that many of the maps that should have been a part of the directory sheets were not included in the manuscript, but were in a separate folder. Therefore, they had not been included when the pages got numbered, mostly, judging by the handwriting, by Ashish. These maps have now been inserted in the directory, hopefully in their correct locations. They have also been allotted the page number of the preceding page with the letters “a”, “b” or “c” suffixed, as required.

It is hoped that this draft directory, though never finalised and published like those for some of the other states, will still have some value because of the data it contains, especially as a baseline to compare with today’s reality.

Happy reading.

Shekhar Singh
December 1, 2020

Changes made

ga new	<u>new QA</u>	<u>ga to sheet</u>	<u>map ga</u>
Bansola	—		
Gro	—		
Marine	—	✓	
Velavadar	—		
Barda	—		
Shrangadha	—		
Gaga	—		
Hingolgadhi	—		
Tessore	—		
Khijadiya	—	—	
Kutch desert	—		
Marine	—		
Nal Sarovar	—	✓	
Porbandar	—		
Rampura	—		
Ratanmahal	—		
Shoolpaneshwar	—		

Office Copy - Do
Not Send!

DIRECTORY OF NATIONAL PARKS AND SANCTUARIES
IN GUJARAT

Management Status and Profile

Ashish Kothari
Shekhar Singh
Pratibha Pande
Editors

Farhad Vania
Associate Editor

Pallava Bagla
Anita Lal
Raman Mehta
Sunita Rao
Assistant Editors

Sponsored by
Wildlife Institute of India, Dehradun

Environmental Studies Division
INDIAN INSTITUTE OF PUBLIC ADMINISTRATION
New Delhi
1990

RESEARCH TEAM

Project Director

Shekhar Singh

Coordination

Ashish Kothari, Farhad Vania

Research Associates

Pallava Bagla, Ashish Kothari, Anita Lal,
Ranjit Lal, Raman Mehta, Pratibha Pande,
Sunita Rao, Farhad Vania

Field Visitors

Pallava Bagla, Ashish Kothari, Farhad Vania

Maps

Pratibha Pande

Technical Information

Pallava Bagla, Joanne Carneiro, Anita Lal, Sunita Rao

Secretarial Assistance

Dev Bahadur, Rachanaa Maheshwari

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MANAGEMENT STATUS

Wildlife Management in Gujarat

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p. 96
mix

GLOSSARY OF TERMS AND ABBREVIATIONS

(For a full list of abbreviations and symbols used in the maps, see Key to the Maps, p. ???). The abbreviations marked with an asterisk (*) are standard sources for all or most of the parks and sanctuaries, and are explained in the chapter 'Note on Methodology'

ACF	Assistant Conservator of Forests
Approx.	Approximately
BNHS	Bombay Natural History Society
BSI	Botanical Survey of India
CCF	Chief Conservator of Forests
CMFRI	Central Marine Fisheries Research Institute
CWLW	Chief Wildlife Warden
DC	Deputy Commissioner
DCF	Deputy Conservator of Forests
DFO	Divisional Forest Officer
E	East
Ed.	Editor
FRH	Forest Rest House
FV	Field Visitor's report/observations*
GH	Guest House
GSFDC	Gujarat State Forestry Development Corporation
HQ	Hectare(s) <i>Head Quarters</i>
IIPA	Indian Institute of Public Administration
IUCN	International Union for Conservation of Nature and Natural Resources
Is.	Island
Km	Kilometer(s)
M	Metre(s)
Map	Map sent by the wildlife authorities*
MP	Management plans*
M.P.	Madhya Pradesh
MSL	Mean Sea Level
NGI	N Non Governmental Individuals
N	North <i>Non-Governmental Individuals</i>
NGO	Non-Governmental Organisation
NH	National Highway
No.	Number(s)
* Notif	Notification*
NP	National Park
N/S	National Park and Sanctuary
Pers. Comm.	Personal communication
PF	Protected Forest
QA	Answers by wildlife wing officials to queries*
Q1	Questionnaire I *
Retd.	Retired
PWD	Public Works Department
RLEGP	Rural Landless Employment Guarantee Programme
R.O.	Range Officer
RF	Reserved Forest
S	Schedule(s)
Sq. Km	Square Kilometre(s)
Spp.	Species
Statebudget	Statement showing budget sanctioned under various sanctuaries and national parks for 1986-87 and 1987-88*
Statestaff	Statement showing staff sanctioned for sanctuaries and national parks during 1986-87 and 1987-88*
Tp	Survey of India topographical sheet*
Vol.	Volume

* With or without full stop .

* Note

W or WL
WLS
WP
ZSI

Wildlife
Wildlife sanctuary
Forest Division Working Plans*
Zoological Survey of India

World Wide Fund for Nature -
India

Local/Hindi/Gujarati Terms

an	Bandar	Island
Dhar	Bela/beli	Island
	Bet	ridge
	Dharansala	Inn
	Dongar/Dungar	Hill
Gir	Gaucher	Grazing land
Gola	Khalashi	Boat assistant
Khara	Kuccha	Unmetalled
laca	Kutias	Shallow temporary wells in river or stream bed
	Maldharis	Nomadic grazier community
	Mali	Gardener
	Mamlatdar	????
	Nadi	River/stream
Mota	Nes/Nesses	Small pastoral settlement(s) of cattle graziers
Nana	Nesda	Big nes
Nawi	Panchayat	Village council
	Patwari	A Revenue Official
	Pir	Pilgrimage spot, where a holy person is buried
	Pukka	Metalled
	Rann	Salt desert
	Talai	small lake
	Talav	Lake, reservoir
Tapu	Tandel	Boat captain
Tapu	Vidi	Grassland from where fodder was supplied
	Wav	A kind of well with steps

INTRODUCTION

The primary objective of this set of directories on the national parks and sanctuaries in India is to make available to the public detailed information on protected wildlife areas, which are a part of our common heritage. Considering the pressures that most of our wilderness areas are facing today, from development projects, industry, and local communities, the task of preserving at least some areas in their natural state has become one of national significance. But people cannot be expected to respond to this task unless they are informed about these areas, and what they contain and represent. These directories, then, are a small step in this direction.

One symptom of the neglect of our protected areas has been the almost total lack of information about them. The task of building up a reliable data-base is so enormous and complex that it cannot possibly be done by the Government alone. Considering the varied expertise needed to properly understand and catalogue the diverse ecosystems in our parks and sanctuaries, a joint cooperative effort between governmental and non-governmental agencies and individuals is urgently required. It is, therefore, hoped that these directories would help in catalysing a process by which groups and individuals would record information and monitor ecological changes within national parks and sanctuaries.

The directory sheets, and other sections of this volume, contain information on various aspects of the management of national parks and sanctuaries which would be of interest to wildlife managers, researchers, policy makers, and enthusiasts.

We recognise that this directory, by perhaps facilitating visits to protected areas, may increase the pressure on them. Though well organised and managed tourist activities are, in our opinion, supportive to the conservation effort, many protected areas in Gujarat have inadequate management resources to deal with a surge in visitors. It is clear that management of most of the parks and sanctuaries in Gujarat needs to be strengthened and we hope that the State Government will heed this. We intend to continuously up-date the information in this directory, both through our own efforts and with the help of others. Readers are therefore requested to write in, especially to correct any wrong information that we might have reported, or to fill in gaps in our directory sheets, or just because they have something interesting to share.

Those readers who would like to be kept informed about future volumes of the directory, and of other publications, or can contribute information, may please write in to:

Shekhar Singh
Project Director
Indian Institute of Public Administration
Indraprastha Estate
New Delhi 110002
India

A NOTE ON METHODOLOGY

The information in this directory is primarily from a questionnaire (QI) filled in by the director or person in-charge of each national park and sanctuary in Gujarat.

Information relevant to the directory was first extracted from this questionnaire. Queries concerning gaps in the information, and seeking clarifications, were then sent to the State/UT Governments. Project personnel (listed below) also visited many of the parks/sanctuaries to get more detailed and up-to-date information, and visited Vadodara, Rajkot, Jamnagar, and Bhavnagar to consult wildlife wing officials. Finally, available secondary sources were consulted before drafting the directory sheets.

Sources

The specific sources of information are indicated in the text, abbreviated and within square brackets []. Where no source is mentioned, it implies that the information was obtained from questionnaire I, or from the State Wildlife Wing in response to queries.

Though a list of sources, along with the abbreviations used for them in the text, is given under References at the back of the volume, some of the more important sources are listed below:

QI	Questionnaire I; filled for each park/sanctuary by the wildlife authorities.
map	Maps of various national parks and sanctuaries sent by the wildlife authorities
MP	Management plans for various national parks and sanctuaries
WP	Working Plans for the various forest divisions within which parks and sanctuaries fall.
Notif	Notification (Gazette) of the park/sanctuary (where there is more than one notification, Notif 1 refers to the first notification, Notif 2 to the second, and so on)
Ip	Survey of India topographical sheet
FV	Field Visitor's report/observations
QA	Answers by wildlife wing officials to queries
Statestaff	Statement showing staff sanctioned for sanctuaries and national parks during 1986-87 and 1987-88, sent by CWLWs office
Statebudget	Statement showing budget sanctioned under various sanctuaries and national parks for 1986-87 and 1987-88, sent by CWLWs office

Field Visitors

The names of field visitors to parks and sanctuaries in Gujarat are given below, with the place visited and the month/year of visit:

<u>National Park</u>	<u>Field Visitor</u>	<u>Dates</u>
Bansda	Farhad Vania	Nov.28 - Dec.2, 1988
Gir	Ashish Kothari	Jan. 26-30, 1988
Marine	Ashish Kothari	Jan.31 - Feb.2, 1988
Velavadar	Ashish Kothari	Jan.19-21, 1988
<u>Sanctuary</u>		
Barda	(not visited)	
Dhrangadhra	Ashish Kothari	Feb. 4-7, 1988
Hingolghadh	(not visited)	
Jessore	Pallava Bagla	June 23-24, 1985 and Oct. 8-11, 1988
Khijadiya	Ashish Kothari	Jan. 31, 1988
Nal Sarovar	Ashish Kothari	July 2, 1986
Narayan Sarovar	(not visited)	
Ratanmahal	Pallava Bagla	Oct. 5-7, 1988
Shoolpaneshwar	Pallava Bagla	Oct. 15-20, 1988

NOTE: No information except basic data on area, location, and date of establishment was available for Porbandar Sanctuary, Rampura Sanctuary, and Gaga Great Indian Bustard Sanctuary, all recently declared. Hence no separate directory sheets have been made for these. Detailed information on the Kutch Desert Sanctuary arrived too late to be incorporated in this draft, but will be added to the final work.

LIST OF NATIONAL PARKS AND SANCTUARIES IN GUJARAT INDICATING CODE, NAME,
AND DISTRICT(S) IN WHICH THEY ARE LOCATED

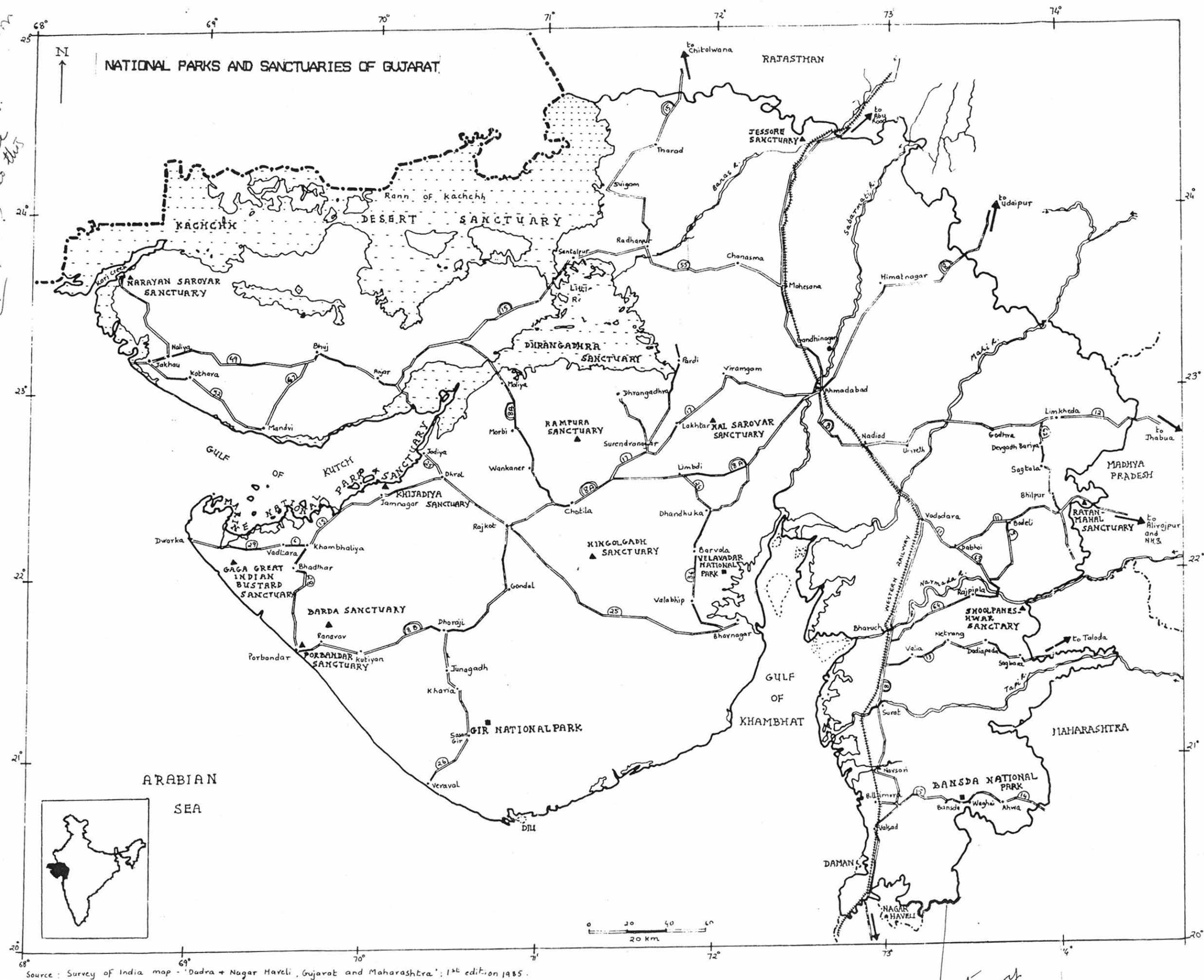
CODE	NAME	DISTRICT(S)
GUJ/N/BAN	BANSDA NATIONAL PARK ✓	VALSAD
GUJ/N/GIR	GIR NATIONAL PARK	JUNAGADH, AMRELI
GUJ/N/MAR	MARINE NATIONAL PARK ✓	JAMNAGAR
GUJ/N/VEL	VELAVADAR NATIONAL PARK #	EHAVNAGAR
GUJ/S/BAR	BARDA SANCTUARY ✓	JUNAGADH, JAMNAGAR
GUJ/S/DHR	DHRANGADHRA (WILD ASS) SANCTUARY (only map ga)	SURENDRANAGAR, RAJKOT, KUTCH, BANASKANTHA, MEHSANA
GUJ/S/GAG	GAGA BUSTARD SANCTUARY *	JAMNAGAR
GUJ/S/HIN	HINGOLGADH SANCTUARY	RAJKOT
GUJ/S/JES	JESSORE SANCTUARY ✓	BANASKANTHA
GUJ/S/KHI	KHIJADIYA SANCTUARY	JAMNAGAR
GUJ/S/KUT	KUTCH DESERT SANCTUARY *	KUTCH
GUJ/S/MAR	MARINE SANCTUARY #	JAMNAGAR
GUJ/S/NAL	NAL SAROVAR SANCTUARY ✓	AHMEDABAD, SURENDRANAGAR
GUJ/S/NAR	NARAYAN SAROVAR SANCTUARY	KUTCH
GUJ/S/POR	PORBANDAR SANCTUARY *	JUNAGADH
GUJ/S/RAM	RAMPURA SANCTUARY *	???
GUJ/S/RAT	RATANMAHAL SANCTUARY only map ga	PANCHMAHAL
GUJ/S/SHO	SHOOLPANESHWAR SANCTUARY ✓	EHARUCH

The directory sheets on these areas are placed alphabetically as per the order given above, national parks first and then sanctuaries.

* No directory sheets are given for these sanctuaries, since information on these was not available (Gaga, Porbandar, and Rampura), or came too late to be included in the draft (Kutch Desert).

The directory sheet of Marine Sanctuary is combined with that of Marine National Park.

I have a new location
map with the
new areas.
This will be
put on the
map. 6.9.91
R



State boundary
to be
made
thicker.

KEY TO THE MAPS

	Boundary of Park/Sanctuary		
	Boundary of Core Zone or Sanctum Sanctorum		
	Interstate boundary		
	International boundary		
	Large seasonal stream *		
	Large perennial stream with island and sand banks		
	Large seasonal river with island		
	Perennial stream		
	Submerged rocks along sea coast		
	Coral reef along sea coast		
	Mud along sea coast, exposed during low tide		
	Sand along sea coast, or offshore sand bank		
	Mangroves along sea coast		
	Swampy area		
	Lake — perennial/seasonal		
	Reservoir — partly seasonal, partly perennial		
	Metalled road (with number of National Highway)		
	Metalled road (with number of State Highway)		
	Unmetalled road		
	Track		
	Railway line		
	Boundary wall		
	Bridge		
	Dam		
	Peak		
	Highest point		
	Ridge		
	Old monument		
	Camping site		
	Accommodation		
	Religious shrine		
	Nursery		
		.STQ	Stone quarry
		.WP	Water point
		.V3	Human settlement
		.NH	Nes
		.WT	Watchtower
		P.C.	Police chauri
		P.O.	Police outpost
		F.R.H.	Forest Rest House
		I.B.	Inspection Bungalow
		D.B.	Dak Bungalow
		T.B.	Tourist Building
		R.H.Q.	Range Head Quarters
		S.Q.	Staff Quarters
		G.H.Q.	Guard Head Quarters
		⊕	Dispensary

* Arrows with stream/river are used in the following ways:

- At tip of perennial stream, they indicate that the earlier stretch is seasonal
- Along the length of a stream, they indicate its direction
- At the downstream end of a stream, they indicate its continuance outside the map area.

Note: All place-names shown on the maps are taken from Survey of India toposheets, for the parks/sanctuaries where toposheets were available.

KEY TO THE DIRECTORY SHEETS

Information for most of the national parks and sanctuaries in Gujarat * is given in directory sheets. The format of these directory sheets is explained below. Headings of sections, as they appear in the directory sheets, are given in bold letters. The type of information each section contains is described in brackets, in italics, after the heading. Where headings of sections do not appear in the directory sheets (eg. Highlights), these are also given within brackets. Clarifications and qualifications, if any, concerning each section are given in normal typeface after the brackets close.

[Code: Appears at the top right-hand corner of first page of each directory sheet. Each national park or sanctuary has a code consisting of three elements as follows:

(1) The first two or three letters denote the State, eg. GUJ for Gujarat and RAJ for Rajasthan;

(2) The next letter denotes whether the area is a national park (N) or sanctuary (S), eg. GUJ/N/BAN for Bansda National Park and GUJ/S/BAR for Banda Sanctuary.

(3) The next three letters denote the first three letters of the first word in the name of the park or sanctuary (see example above).

(For a full list of codes and names of national parks and sanctuaries of Gujarat, see page ??)]

[NAME OF PARK/SANCTUARY]

[HIGHLIGHTS: Gives a brief description of the area, highlighting the ecological, topographical, historical, and cultural values.]

LEGAL STATUS : [Gives the date on which a sanctuary or national park was notified. If the area was notified prior to 1972, it gives the Act under which this was done. For national parks where final notification has not been issued (for explanation see below) it gives the date when the intention to constitute the area into a national park was declared. For those national parks which were earlier sanctuaries, it also gives the date on which the area was earlier notified a sanctuary. In all the above instances the notification numbers, where available, are also given.]

The Wild Life (Protection) Act, 1972, (hereafter called the Act) which governs the setting up and management of national parks and sanctuaries, prescribes a number of steps for the establishment of protected areas.

These steps are:

- (1). Notification of the area as a sanctuary [Section 18 (1)] or declaration of intent to make it into a national park [Section 35 (1)].

* NOTE: No information except basic data on area, location, and date of establishment was available for Porbandar Sanctuary, Rampura Sanctuary, and Ganga Great Indian Bustard Sanctuary, all recently declared. Hence no separate directory sheets have been made for these. Detailed information on the Kutch Desert Sanctuary arrived too late to be incorporated in this draft, but will be added to the final work.

- (2). Identification of the rights existing in the area [Section 19].
- (3). Acquisition, settlement, exclusion of these rights [Section 24].
- (4). Final notification in the case of national parks [Section 35 (4)].

In the Directory sheets the phrases "notified a sanctuary" and "intention declared to constitute it into a national park" are used for those sanctuaries and national parks respectively where the legal procedures have not been completed. In those sanctuaries where the required legal steps have been completed, this information is also given here.

AREA AND ZONING: [Gives the total area of the park or sanctuary in hectares, rounded off to two decimal places; and in square kilometers, within parentheses, also rounded off to two decimal places. Also gives any modifications in this area that may have taken place since the park/sanctuary was established. Further gives the existing or proposed break-up of the area into various types of zones, if any.]

Various types of zonation, mainly into core and buffer management units, are found in parks and sanctuaries in India. The different types that we have encountered are listed below :

1. Where both the buffer and the core zone are inside the notified park/sanctuary.
2. Where the park/sanctuary is designated the core zone, and an area surrounding it but outside the park/sanctuary is designated buffer zone.
3. Where a national park is designated the core zone and a sanctuary surrounding it or adjacent to it is designated buffer zone.
4. Where the original notification designates both the core and the buffer zones, but only the core zone has been taken over for management as park/sanctuary while the buffer zone remains outside the managed area.

The actual situation for each park and sanctuary has been clarified under this head.

Also, the term 'zone' has been universally used to describe what has been variously called buffer 'belt' or 'area' in the notification and other documents.

LOCATION: [Gives the administrative district(s) within which the area is located, the latitudinal and longitudinal range of the area, and the nearest town, railhead and airport.]

Information regarding longitude and latitude of each park and sanctuary was mostly obtained from Survey of India topographical sheets, in the case of those areas for which these were available. Where no toposheets were available, information is as supplied by the wildlife authorities either in the questionnaire or in the map.

APPROACH(ES): [Gives distances and convenient approaches to the area, from state headquarters or other prominent towns or cities. Unless otherwise specified, the routes mentioned are by road.]

Approaches to parks and sanctuaries have been given from Ahmedabad, Gandhinagar, or Vadodara, whichever is the nearest. In some cases

approaches are also given from Bombay, since air connections are from this city rather than from Ahmedabad.

TOPOGRAPHY AND CLIMATE: [Gives altitudes, temperatures, and mean annual rainfall.]

Information regarding highest and lowest points in each park and sanctuary was mostly obtained from Survey of India topographical sheets, in the case of those areas for which these were available. Where no toposheets were available, information is as supplied by the wildlife authorities either in the questionnaire or in the map.

Information regarding temperatures, rainfall and snowfall usually pertain to the meteorological station nearest to the park/sanctuary. Only very rarely is such a station located within the protected area. This data, as such, can only be seen as an approximation.

Further, even where the data is from inside the park/sanctuary, it will refer to only one spot and would not necessarily indicate the range of temperatures and precipitation occurring in that park or sanctuary.

Though the lowest point for Marine National Park has been shown as 0 metres above sea level, strictly speaking the lowest point for this area would be on the seabed.

The abbreviations used under this head are:

- m : metres above mean sea level
- mm : millimetres
- C : celcius

FLORA: [Describes the vegetation, and lists the forest types as per the revised list of Champion and Seth (Champion and Seth 1968). Information is also given about plantations, and about introduced and threatened plant species.

A full list of trees and other plants found in the park/sanctuary appears in Appendices 3 & 5. The scientific, English, and family names of these species is given in Appendices 4 & 6.]

Information given on forest types refers to the classification of forests developed by Sir Harry Champion and S.K. Seth (Champion and Seth, 1968).

The flora lists given in Appendices 3 & 5 are separated into 'Trees' and 'Other Vegetation'. In the former are included plants which have been definitely classified as trees in recognized texts; in the latter come all other forms of plants, including those for which the classification into 'trees' and 'non-tree plants' is unclear.

FAUNA: [Lists mammals, reptiles, amphibians, insects and other fauna occurring in the area. Also lists locally threatened species, i.e., those that are threatened in the area, irrespective of whether they are threatened in the country as a whole. A list of birds found in the area occurs in Appendix 7.

Usually only common names of fauna are listed. However, if common names are not known for a particular species, its latin name is given. The scientific name of mammal and reptile species listed in the directory are given in Appendix 8.]

On occasions the fauna listing obtained has contained only generic names (e.g. squirrel), and no specific name. In such cases, where it is known that the genus has only two species, or only two of its species can possibly occur in the area under question, both the species have been mentioned with a slash (/) in between and a question mark (?) after them (e.g. Squirrel, Threestriped Palm/Fivestripes Pal-?). This means "one of the two or both".

The list of birds found in each area has not been given with each directory sheet, for reasons of space. This list appears in a

consolidated chart for the whole state, in Appendix 7.

In all the fauna lists, the common names of various species are listed in alphabetical order. Vernacular or English names which are not standardised but are often more commonly known (e.g. Nilgai for Bluebull) are given in brackets. A list of the common names along with the corresponding scientific names has been provided in Appendix 8.

There are inconsistencies in the usage of common and scientific names among different sources. For the purpose of this directory usage has been standardised according to the following sources:

Mammals : Prater S.H., 1980
Birds : Ripley, S. Dillon, 1982
Reptiles : Daniel, J.C., 1983; Whitaker, R., 1978

The available lists of fauna are neither necessarily complete nor always current. Especially scanty is information on insects, fishes, and other invertebrate animals. Biological studies on many parks and sanctuaries have not been done or are inadequate. In addition, at least some of the lists provided by the wildlife authorities owe their origin to forest working plans, where each successive plan often reproduced the list in the earlier plan. It is, therefore, expected that all the fauna listed for any park or sanctuary might have occurred there at some point in time, but whether all of it still exists there is not certain.

The population and density of species has not been mentioned except occasionally in a very general way. This is mainly because reliable information on these aspects was usually not available.

OCCURENCE AND CONTROL OF DISEASE : [*Gives information about flora and fauna epidemics, vaccination of livestock, and availability of a veterinarian.*]

Vaccination for Livestock: As very few areas have reported vaccination programmes for livestock, their absence has not been mentioned in the directory sheets. Only where vaccination has taken place, the fact has been mentioned in the section on occurrence and control of diseases.

The same applies for the practice of checking whether livestock entering parks or sanctuaries are vaccinated.

Veterinarian: Though veterinarians have been reported from many areas, it must be remembered that they are invariably vets trained to look after domesticated animals. However, their presence ensures the availability of their advice and services during an epidemic or in an emergency involving wild animals.

OTHER FACTORS AFFECTING HABITAT: [*Gives details of forest fires, frost, gales and cyclones, hailstorms, hot winds, pollution, water-logging, avalanches, and land slides.*]

WATER RESOURCES : [*Lists natural and artificial water sources, both perennial and seasonal.*]

BUDGET : [*Indicates whether a separate budget exists for each area. Where a separate budget does exist, the budgeted amount for the last two years for which information is available is given. Where the budgetary allocation is for one or two specific types of expenditure, these are also mentioned.*]

MANAGEMENT PLAN : [*Indicates the existence of a management plan for the area, its status and the period for which it is valid.*]

Though some of the parks and sanctuaries have prepared management plans, these vary in content and coverage; some have a lot of details, while others are little more than a budget for capital expenditure.

Also, it is not always certain that the management plan, though prepared, has been approved, or is being followed even if it has been approved.

PERSONNEL: [Gives designation and number of staff, and identifies the local in-charge.]

The senior-most officer of a park or sanctuary living in or adjacent to it, has been designated the local in-charge.

Where any of the park or sanctuary staff have had wildlife training, this is mentioned under this head.

EQUIPMENT : [Lists equipment available at or for the area. Does not list basic equipment like torches and lathis nor office equipment and furniture.]

RESEARCH AND MONITORING : [Details research and monitoring work on/in the park or sanctuary. Also indicates availability of literature on the area.]

Most protected areas in Gujarat have at least an outline map, and sometimes a more detailed one is available at the divisional headquarters. The availability of maps has thus not been specifically mentioned, except where the map available is of a specialised nature (e.g. a wildlife distribution map).

COMMUNITY INTERACTION PROGRAMMES: [Details educational activities for local communities on wildlife and wildlife management.]

HUMAN PRESENCE : [Gives details regarding rights and leases, habitation, grazing, offences and illegal activities, tourism, use by other government agencies, and other miscellaneous activities within the area, indicating extent and type of activity.]

Habitation: The number of villages mentioned in the directory sheets is that given by the state wildlife authorities. In some cases this is different from the number shown on the map, either because the locations of some of the villages are not known and therefore cannot be shown on the map, or because the map is based on Survey of India toposheets which depict a different number of villages.

Relocation of Villages: Though many of the parks and sanctuaries have villages located within their boundaries, there has been no relocation of these villages to areas outside, except in the case of Gir. This absence of relocation has therefore not been specifically mentioned in the directory sheets.

Minor Forest Produce: This phrase includes herbs, roots, plants, bark, seeds, flowers, cocoons, grasses, leaves, bamboo, kindling and brush wood.

Plantations for Fuel and Fodder: As fuel and fodder plantations have been taken up in or around very few of the parks and sanctuaries, their absence has not been specifically mentioned. Only where such plantations exist, relevant available information has been given in the section on human uses.

Number of Visitors: Though, for certain areas, the number of visitors has been indicated, it must be kept in mind that very few of the parks or sanctuaries in Gujarat have a strict regulation of entry, or are totally enclosed. Therefore, in many cases the number of visitors is only a rough estimate made by the park or sanctuary authorities.

INFORMATION FOR VISITORS: [Indicates entry restrictions if any, best time for visiting the area, historical and cultural sites, accommodation and other facilities available, and future plans, if any, to extend tourist facilities.]

Seasons: The winter months in Gujarat are from November to March, summer from April to June, monsoon from July to September, while October can be described as autumn, not too wet and not too cold.

Trained Guides: None of the parks and sanctuaries in Gujarat employ trained tourist guides. This being a universal state of affairs, their absence has not been remarked upon separately for each area.

NGOs/INDIVIDUALS ASSOCIATED: [Gives names and addresses of non-governmental groups or individuals associated with the area.]

CONTACT ADDRESS(ES): [Contact addresses have been given, where available, of both the local in-charge, who can be contacted personally at the park or sanctuary, and of the divisional in-charge, who should be addressed in the matter of accommodation, information, etc.]

Miscellaneous

Date of Information: For some items, the date of information has been given in the text. For others, the information has been checked with the State wildlife authorities upto October 1988. However, in many items, like population, fauna and flora listing, etc., the information is not necessarily updated to October 1988, but is as appeared in the last update by the State authorities.

Information not available: Wherever it is indicated, for a head or item, that information is not available, it means that information is not available with the Wildlife Wing of the concerned State, including the park/sanctuary authorities. It is quite possible that this information is available with some other source but we have not been able to procure it.

Contact addresses: The sheets provide information on the local and regional contact addresses relevant to each area. In addition, the following address will be relevant for all parks and sanctuaries in Gujarat:

Chief Wildlife Warden
Kothi Annexe
Vadodara - 390 001
Gujarat

DIRECTORY SHEETS

BANSDA NATIONAL PARK

The Dangs region of southern Gujarat is one of the few places in the state which still retains good forest cover. Bansda National Park, being the only wildlife protected area in this region, is therefore of great significance. Once a private reserve of the ex-Maharaja of the erstwhile Bansda State, the park still contains a rich floral and faunal diversity. The park lies in the Ambika River Valley, and is mostly hilly.

LEGAL STATUS : Intention to constitute area into a national park was declared on August 10, 1976. Final notification was issued on April 9, 1979 vide Notification No. GKH-35-79/WLP/2076/87504-P [Notif 1].

Area

AREA AND ZONING : 2,399.44 ha. (23.99 sq.km).

Area = 1791 ha
(qa⁹¹ notif)

Area originally declared was 608.44 ha. Intention to add 1,841.76 ha. was declared vide Notification No. AKH-116(A)/79/WLP/2076/87504-P dated 10-7-1979; final notification for 1,791.00 ha. of this area came vide Notification No. G-AVN-35/85-WLP-2076-87504-V-2 dated 13-6-1986 [Notif 2]. No reasons are available for why the final notification was issued for an area smaller than intended.

Core Zone : 500.00 ha. Buffer Zone : 1,899.44 ha.

LOCATION : District : Valsad

Latitudinal Range : 20° 44' 50" to 20° 43' 27" N [Tp]

Longitudinal Range : 73° 26' 05" to 73° 29' 31" E [Tp]

Nearest Town : Waghai (3 km.)

Nearest Railhead : Waghai (3 km.)

Nearest Airport : Vadodara (280 km.)

APPROACHES : Vadodara to Billimora (226 km.), on to Bansda (46 km.), then to the edge of the park near Navtad (8 km)

Vadodara to Billimora (226 km.), on to Waghai on narrow gauge track (approx. 65 km.), then to the park (3 km.)

TOPOGRAPHY AND CLIMATE : " The whole of the Bansda National Park is hilly but for some of the areas in Sadaddevi (Sadardevi) and Waghai villages ... Few patches of plain ground are however seen, thus giving an appearance of a rolling country ... The entire area falls within Ambika (River) valley and contains compact forests and luxuriant vegetation. The top of the hills do not form into well defined ridges but are small plateaux... The gradient is very moderate except of those hills on the South-Western portion where it is quite steep. There are however, perfectly plain grounds, like Eharadi Maidan." [MP]

Highest Point : 358 m [Tp]

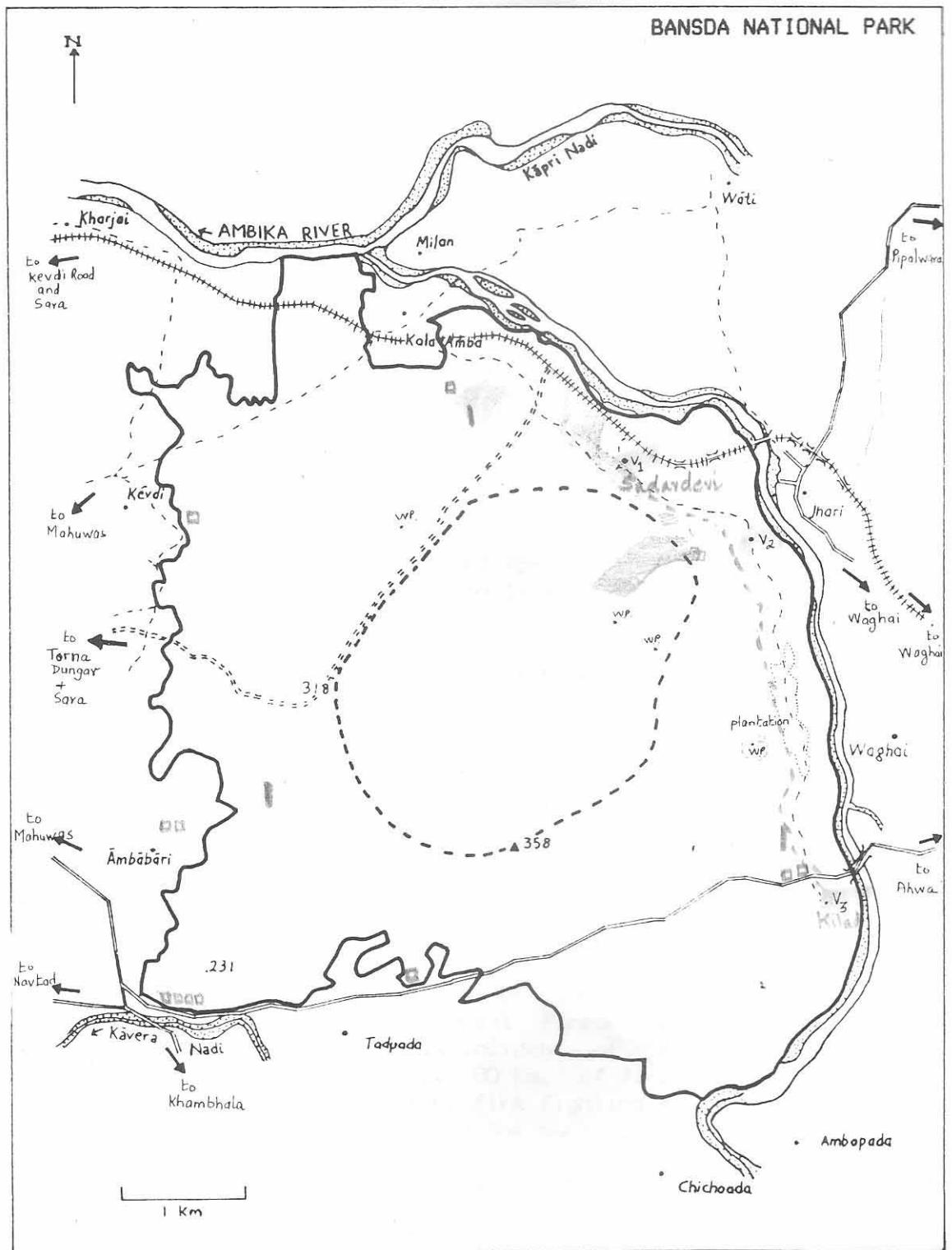
Lowest Point : 55 m [Tp]

Max = 44°C
Min = 10°C
(qa 91)

Maximum Temperature : 44°C [Q1] 42°C [MP] ???

Minimum Temperature : 20°C [Q1] 10°C [MP] ???

Mean Annual Rainfall : 1600 mm



Names of villages and smaller human settlement inside

V ₁	Sadardevi	V ₂	Nari Waghai	V ₃	Kilad
----------------	-----------	----------------	-------------	----------------	-------

○ Perennial water hole

KEY

□ Forest department housing

! Check dam

--- Metal road - Kilad to Sadardevi

■ Bharadi Maidan (gaṇḍ)

FLORA : The park "contains very rich moist deciduous forest with a middle aged crop of 0.5 to 0.7 density ... Because of heavy rainfall and moist deciduous nature of the forest, the undergrowth in the area is also quite thick and luxuriant." [Scheme]

The forest type is South Indian Moist Deciduous Forests 3B [WP].

FAUNA :

MAMMALS [Q1; MP; Note - Bansda]

Boar, Indian Wild
Cat, Jungle
Deer, Barking
Deer, Spotted (Chital)
Hare, Indian — ? fl. check distribution.
Hyena, Striped
Jackal
Leopard (Panther)
Porcupine, Indian
Squirrel, Indian Giant

A total of 16 saltlicks have been prepared for animals. Food and fodder species such as groundnut, millets, and lentils have been planted for monkeys and deer.

Several species recorded earlier in these forests are no longer seen, including the Tiger (except for an unconfirmed sighting in 1938), Wild dog, and Sambar [Pers. comm., Raja].

OCCURRENCE AND CONTROL OF DISEASE : Trees in the park have been affected by an unknown defoliant and by white ants; no further details, including the species affected, are available.

Vaccination of livestock has been undertaken in and around the park by the Animal Husbandry Department, with about 70% of the livestock population having been covered. The nearest veterinarian is located at Mahuwas, 4 km away.

OTHER FACTORS AFFECTING HABITAT : Forest fires are an occasional occurrence from February to May. Six incidents of fire were recorded from 1985 to 1987, affecting 105 ha. 80 km. of firelines have been completed [Note - Bansda]; in addition, fire fighting staff is employed seasonally. Water shortage also occurs in the summer.

WATER RESOURCES : Arbika River flows along the eastern and northern boundary of the park. There are also several seasonal streams, one perennial tank (artificial), four perennial troughs (artificial), and three concrete and three earthen checkdams holding water seasonally.

BUDGET : Rs. 3,04,000.00 for 1987-88 (down from Rs. 3,67,000.00 in 1986-87) [Statebudget]

New Budget : given for 1989-90, see Q.A. 6.4.91. 1989-90 = Rs 10,98,097/-

MANAGEMENT PLAN : A plan prepared in 1979 was never approved. A draft development plan was subsequently prepared for the period 1984-85 to 1988-89 [MP], the status of which is not known. (qa 91)

New management plan :

No management plan in existence from 1984-88 to 1988-89
management plan under preparation and to be submitted soon

(five) qa 91

PERSONNEL : One Range Officer, two Foresters, two Beat Guards, one mali, and two armed Police Constables. The Range Officer, designated the park Superintendent, is the local in-charge, stationed at Navtad.

New info:

EQUIPMENT : One motorcycle and two rifles. The constables also have two rifles. *Only one Bullet motorcycle mentioned in qa 91*

New information:

RESEARCH AND MONITORING : None ?

COMMUNITY INTERACTION PROGRAMMES : None ?

HUMAN PRESENCE :

Rights and Leases : Inhabitants of the villages inside are allowed to graze their livestock, to collect fuelwood, construction wood, and minor forest produce, and to cultivate inside the park, apart of course from using it for habitation. The ex-Maharaja of Bansda owns 50 ha. of mango plantations inside the park. All these activities are illegal, as per the Wild Life Protection Act of 1972, but they have been allowed to continue.

3 acc. to Tp. ? -

Habitation : There are two villages inside the park with a population of about 300. In addition there is a tiny settlement next to the plantation owned by the ex-Maharaja, inhabited by a few caretakers [FV]. As in the case of the above activities, habitation in a national park is illegal. *Only two villages inside the Park - Sadardevi and Kilad fall. Nani Waghai village is outside the Park boundary (qa 91)*

The surrounding area has some 30 villages, the population figures of which are not available.

Grazing : 40 goats and 325 feral cattle of the park villages graze inside. They are reportedly permitted to graze inside the park, even though, under the Wild Life (Protection) Act of 1972, all grazing inside a national park is illegal.

Offences and Illegal Activities : Apart from grazing by livestock of the villages inside the park, there is also unauthorised grazing by livestock from outside [FV].

1989-90

1989-90

illicit cutting = 6

grazing = 3

wild life = 1

Misc = 10

(qa 91)

New info.

Between 1924 and 1988, the following cases were filed or offences detected : Seven of causing fire hazard, two of hunting, 25 of illicit cutting, one of illegal possession of weapons, and four of grazing. In addition, there are two instances when trucks carrying illegally cut wood and 25 instances when bamboo baskets were impounded.

Tourism : The park is not yet open to tourism, and the number of visitors is negligible [FV]. In 1986, 30 students of Navsari town participated in a nature education camp at the park.

In 1989-90 = 378 tourists (qa 91)

Use by Other Government Agencies : A 6-km. stretch of road from Kilad to Sadardevi was constructed by the Forest Department, which also occupies 0.10 ha. for housing. The Gujarat State Electricity Board has 6.21 km. of transmission lines running through the park, by the road along the southern boundary. There is also a 5.25 km. stretch of railway track through the northern portion of the park [Tp], along which run telephone lines.

Miscellaneous : In 1977-78, a total of 172 labourers were employed for road repairs, construction of check-dams, buildings, and a boundary wall, and clearing of firelines.

New info:

A few incidents of attack on humans and of livestock lifting by leopards are reported. In 1982-83 a girl was killed, and there are 10-12 cases of livestock injury or death every year.

no Inform:

Minor clashes between local people and the park authorities, over instances of illegal grazing and other offences, are a continuous feature.

New Inform:

INFORMATION FOR VISITORS : December and January are the best months to visit the park, since the weather is pleasant. April to May is also a good period to visit, this time for wildlife sighting. There is a Botanical Garden for rare and medicinal plants 3 km. from Waghai, outside the park [FV].

Permission for entry, by vehicle or on foot, is required to be obtained from the DCF, Ahwa.

Any change:

There are three Rest Houses, two of which are owned by the Forest Department, with a combined total of 20 beds. These are all on the outskirts.

status:

Future proposals for developing tourism a Safari Park near the Botanical Garden, a visitors' centre, library, and museum at Navtad, hides and watchtowers inside the park, and the use of a minibus for trips around the park.

New Inform:

NGOs/INDIVIDUALS ASSOCIATED : The Environmental Action Club, Dharampuri, organised a nature camp in the park in 1987 [FV]. The ex-Maharaja of Bansda is associated in various activities relating to the park [FV].

New Inform:

CONTACT ADDRESSES :

Range Officer/Park Superintendent
Bansda National Park

Navtad - Pin?? 396580 (9a 91)
District Valsad
Gujarat

Deputy Conservator of Forests,
South Dangs

Ahwa
District Dangs - 394 710
Gujarat

*Any
Change?*

GIR NATIONAL PARK

Located in Saurashtra, Gir is one of India's most important wildlife reserves, home as it is for the last wild population of the Asiatic lion (Panthera leo persica). The protection given to the lion, and its consequent recovery from a point of near-extinction, is indeed amongst the country's most successful conservation efforts. But Gir is far more than just a home for the lion, as its forests represent perhaps the last large stretch of dry deciduous vegetation in Gujarat, harbouring an immense variety of flora and fauna. In 1975-76 it won the first Challenge Trophy of the Chairman of the Indian Board for Wildlife for the best managed sanctuary in the country [IBWL]. It is also the site of a successful Freshwater crocodile breeding programme. The reservoir formed by Kamleshwar Dam, in the north-west of the park, contains a remarkable concentration of crocodiles. On a winter day, one can see over a hundred lined up on a few hundred metres stretch of the lake's shore.

Gir is also home to a very old community of cattle graziers, the Maldharis. These people have co-existed with the area's forests and animals for generations. The park also contains several prominent temples where pilgrimage is common, the three major ones being at Banej, Kankai, and Tulshishyam. During the months of *respectively.*

protection
status
before 1934:

The entire area was declared Reserved Forest in parts, first between 1932 and 1945 by notifications of the former states of Baroda and Junagadh, then again between 1963 and 1974 by the Government of Gujarat under the Indian Forest Act of 1927 [WP].

LEGAL STATUS: 18 September, 1965 as sanctuary. Intention to constitute into a national park, declared on December 21, 1974. Finally constituted as national park on 21 May, 1975.

Old area
maps
available?

An area of 126,501.7 ha. was initially declared a sanctuary on 18 September, 1965, under the Gujarat Wild Animals and Wild Birds Protection Act 1963 [Q1, Rashid]. To this an area of 14,711.3 ha. was added on January 16th 1974. On 21 December, 1974, an area of 14,040.40 ha. of the sanctuary area was demarcated and the intention declared to constitute it into a national park. Proclamation to this effect was issued on the same day by the Collector. It is unclear whether procedures for acquisition of rights were the carried out as laid down in the Wild Life (Protection) Act 1972, but final notification for this area as a national park was issued on 21 May, 1975. Meanwhile, on 3 September, 1976 an additional 11,830.60 ha. of the sanctuary was demarcated, and intention declared to constitute it as part of the national park; collector's proclamation for this was issued on October 6th 1976, and final notification came on 12 July 1978. (It is again unclear if procedures relating to rights in this additional area were carried out.)

Finally, on 20 February, 1982 intention was declared to constitute the entire present area (including the sanctuary) into a national park.

Query Notification no:

AREA AND ZONING: 1,41,213.15 ha. (1412.13 sq.km.)
 (Original area of sanctuary : 1,26,501.7 ha.
 Area added to sanctuary : 14,711.3 ha.
 Original area of national park : 14,040.40 ha.
 Area added to national park : 11,830.60 ha.
 (Please see LEGAL STATUS above)

There is no zoning.

Earlier, the finally notified national park area of 25,871.00 ha. was considered the Core Zone, with a 1 km. radius area around it (within the sanctuary) as Buffer Zone (see inset map). With intention declared to constitute the whole area into a national park, this zoning is no longer considered relevant, though the earlier practice of giving the Core Zone greater protection still continues.)

LOCATION: District : Junagadh and Amreli

Latitudinal Range : Approx. 20° 57' to 21° 20' N [Tp]

Longitudinal Range : Approx. 70° 27' to 71° 12' 52" E [Tp]

Nearest town : Talala (13 km.); Veraval (42 km.)

Nearest railhead : Sasan (0 km., immediately adjacent)

Nearest airport : Keshod (approx. 50 km.)

APPROACHES: From Ahmedabad to Junagadh by train or bus (327 km.), then on, partly through the park, to Sasan (54 km.) by bus or by meter-gauge train

From Bombay to Keshod by air, then on by bus to Sasan (approx. 50 km.)

TOPOGRAPHY AND CLIMATE: The area is "rugged and hilly... slopes are generally moderate... The area is divided into a number of watersheds, from where streams originate and feed the principal rivers of the tract... There are also plains (in some) places... Hills are of volcanic origin... The prevailing rock is dolomite or basalt (and) lime stone is of common occurrence... Soil varies from place to place. It is generally black with varying proportions of loam [WP]."

Highest Point : 528 m. above msl [Tp]

Lowest Point : 152.00 m. above msl [WP]

"Temperature variation is very wide. Hottest month of the year is usually May, sometimes April... Rainfall is erratic and irregularly distributed... Maximum and minimum annual rainfalls are 1,730 mm and 210 mm respectively [WP]."

Maximum Temperature : 46.0° C (at Mendarda) [WP]

Minimum Temperature : 10.0° C (at Visavadar) [WP]

Mean Annual Rainfall : 806.6 mm (average between 1961-1968 of rainfall at Mendarda, Talala, Una, and Visavadar) [WP]
 1000.0 mm (Sasan) [606/72]

FLORA: The national park contains a "compact block of dry deciduous forest... As one goes eastwards or higher up on the hills, the free growth becomes more and more sparse and stunted. The eastern portions contain more open miscellaneous forest with long stretches of grassy areas [GOG'72]."

Interestingly, the western and eastern portions of the park differ significantly from each other. The predominant forest type in the west is SA/C1 (a), Very Dry Teak Forest, with teak as the dominant tree species [WP]. This occupies approximately 70,000 ha., or about half the area of the park. In the east, the main forest types are S/DS1, Dry Deciduous Scrub, and S/DS2, Dry Savannah Forest -- both of which have very little teak and a predominance of Khair (Acacia catechu), Dhavdo (Anogeissus latifolia), and other related species [WP]. These two types comprise another 70,000 ha., i.e. most of the other half of the park. There are also patches of dense growth along streams and rivers, containing Jambu (Syzygium cumini), Karanj (Pongamia pinnata), and various Ficus species [WP].

Several plantation schemes were launched in 1961-62 and carried on briefly after the area was declared a sanctuary [WP]. These included plantations of Agave (Agave americana), Bamboo (Dendrocalamus strictus), and some (unspecified) fast-growing and soil-conservation species [WP]. Teak plantations have also been carried out in the past, but were discontinued in 1974-75. More recently, between 1979-80 and 1983-84, 7812.91 ha. were planted with the purpose of improving wildlife habitat. Species planted included Khair (Acacia catechu), Babul (Acacia nilotica), Ambla (Erblica officinalis), Gorad (Acacia senegal), Neem (Azadirachta indica), Kadaya (Sterculia urens), Sisoo (Dalbergia sisoo), Bamboo (Dendrocalamus strictus), and others.

The forests of Gir have seen considerable degradation due to past logging, grazing, fire, and other factors. In some places these degraded forests have been invaded by weeds, including Lantana camara, Neurocanthus spherostachys, and Cassia tora [FV]. So far, only manual uprooting of Lantana has been attempted. However, the spread of these weeds is localised, and not yet considered to be widespread enough to warrant alarm [FV].

FAUNA: While focus has remained on the lion, the forests of Gir contain a number of other mammals, and almost 300 species of birds.

MAMMALS [Q1; BRO; Chavan-b; Sinha]

Antelope, Fourhorned (Chowsingha)
Antelope, Indian (Blackbuck)
Boar, Indian Wild
Bull, Blue (Nilgai)
Deer, Spotted (Chital)
Fox, Indian
Gazelle, Indian (Chinkara)
Hare, Indian

Hyena, Striped
Jackal
Langur, Common
Leopard
Lion
Pangolin, Indian
Porcupine, Indian
Sanbar

When was this started
19 or 18
Is there any info. about the forest types in the forest Div. Working pl. for the area?

REPTILES (Q1; Sinhal)

Cobra, Indian

Crocodile, Marsh

Krait, Common Indian

Monitor, Common Indian / Desert ? *Query*

Python, Indian

Snake, Common Green Whip

Snake, Common Rat

Tortoise, Starred

INSECTS (WP)* *Which one?*

Hybloea puera

Hapalea machaeralis

Coelosterna scabrator

The Asiatic lion and the four-horned antelope are believed to be locally threatened. The protection measures so far are only those taken generally for the park, such as the construction of a rubble wall completely around the area, and a ban on grazing.

An artificial breeding programme for the Freshwater crocodile was initiated in 1976-77. It seems that there was a heavy concentration of crocodiles in the past in the major rivers and tanks of the Gir area, but disturbance due to grazing, fishing, and egg collection caused a decline in numbers [Chavan-a]. The breeding programme has been successful in increasing the number of crocodiles from about 200 in 1976-77 to nearly 1000 now [Chavan 1979]. *Status now: Query*

An attempt has been made to introduce Blackbuck into Gir. In 1978, some (number not available) were captured at Velavadar National Park and released here, but none have survived.

Five to six pairs of Grey hornbills were also released into Gir, in 1979-80, in an attempt to restart a population that had been exterminated by hunting. Their present status is unknown, and in all likelihood they may not have survived. *Query*

Any new inform:
OCCURRENCE AND CONTROL OF DISEASE: Past silvicultural practices have encouraged monocultural growth of teak in many parts of Gir, thereby also increasing the possibility of large-scale pest attack [Berwick]. It was reported that "teak stands in the Gir Forest are subject to regular and often near total defoliation by two species of caterpillars" [Berwick]; the Working Plan reported three insects causing damage - the teak defoliator Hybloea puera, the teak leaf skeletoniser Hapalea machaeralis, and the collar eating caterpillar Coelosterna scabrator [WP]. *Status now:*

The presence, in the past, of a large number of cattle inside the park created the possibility of transmission of disease by these cattle to the wild herbivorous population [WP]. Though no study has been carried out on this, recently, as part of ongoing research on lions, it has been noticed that "five sambar kills were showing signs of suffering from foot and mouth disease. Two of the chital kills were infected with FMD [Chellam]."

Status now?

* These insects are mentioned as pests on the trees of the park. No information is available on other insects found in the park.

OTHER FACTORS AFFECTING HABITAT: As the Saurashtra region of Gujarat is drought-prone, Gir is occasionally affected by dry spells [FV]. The whole park was hit by 3 consecutive years of drought, from 1985 to 1987, though the impact of this on wildlife is not known.

The dry nature of the area also makes it prone to forest fires, especially between March and June. Between 1979-80 and 1983-84 some 31,542 ha. of the park were affected by a total of 212 fires. Ironically, heavy rains in 1983 led to high grass growth which, when dry, proved a fire hazard. 1984 thus saw the most widespread fire damage in recent times, with over 14,000 ha. being affected. It has been noticed, over the years, that "fire tender species have almost disappeared and the proportion of fire hardy species is on the increase [WP]." As a preventive measure, the park has 546 km. of firelines. It also employs labourers (numbers not known) for fire fighting.

Of other factors affecting the area, soil erosion is reported to be common in some parts, "especially in open and sparsely wooded areas of the tract. Eastern part of Gir Forests is chronically affected by erosion [WP]."

In November 1982 a severe cyclone, lasting almost a week, uprooted about 28 lakh trees. The damage is still visible in the form of a large number of stumps, twisted trunks, and fallen trees [FV].

WATER RESOURCES: 14 perennial streams, 18 perennial and seven seasonal (artificial) tanks, 75 perennial (artificial) waterholes, four perennial dam reservoirs, and five springs, comprise the water sources of the area.

Apart from these, the "tract is cut up by innumerable streams. Almost all of them are monsoon torrents, retaining water for only few months... The wildlife also depends on stagnant water of rivers, or on kutias," "during the dry season [WP]. "Except in severe drought years, water supply from these wells (kutias) is quite adequate. Water table is usually 6 to 10 m. Water supply position has eased at many places due to construction of dams across rivers [WP]."

Map of Gir
Location of and extent of submergence of dams and land respectively is to be shown on TP xeroxed here!

BUDGET: Rs. 22,94,000.00 for 1987-88 (Up from Rs. 18,53,000.00 in 1986-87), for the finally notified national park [Statebudget]. The budget for the remaining area (formerly sanctuary) is clubbed with the budget for Barda Sanctuary - it was Rs. 19,12,000.00 for 1987-88 (down from Rs. 28,70,000.00 in 1986-87) [Statebudget].

status now:

MANAGEMENT PLAN: A 'Working Plan for Gir Forests', oriented toward wildlife conservation and therefore acting as management plan for the park, was written and approved in 1975 [WP]. It was applicable from 1976 to 1985. It has not, so far, been replaced by a new plan [FV].

Management at present is reported to be along the lines laid out by the Indian Board for Wildlife in the early 1970's, and adopted by the Government of Gujarat vide Resolution No. WLP.1571/62691/P, dated 2 March 1972 [GOG'72].

status now:

PERSONNEL: Gir is by far Gujarat's best-staffed wildlife reserve. It has one Conservator of Forests, who also holds the charge for other parks and sanctuaries in Junagadh Division. It also has, exclusively for the park, two Deputy Conservators of Forests, one Assistant Conservator of Forests, five Range Officers, 16 Foresters, seven Orderly Guards, 15 Checkpoint Guards, one Sanctuary Guard, two Game Guards, 28 Superintendents, one tracer, five surveyors, one veterinarian-cum-animal husbandry officer, seven helper-cum-watchmen, three helpers, one tractor driver, one station-wagon driver, 11 jeep drivers, two truck drives, one mechanic, one foreman, one electronic engineer, one technical assistant, 45 wireless operators, 1 wireless electrician, one watchman, one sweeper, and 21 office staff members. Also (attached to park ??) one Deputy Collector, one Deputy Mamlatdar, one Agricultural Supervisor, and one Circle Inspector [Statestaff]. The DCF at Sasan-Gir is locally in-charge.

New status:

EQUIPMENT: Relative to other national parks and sanctuaries, Gir is one of Gujarat's best equipped areas [FV]. It has a wireless network with 5 fixed and 2 portable sets, 54 rifles/guns, 10 pairs of binoculars, 3 dartguns.

(Vehicles ???)

New status:

RESEARCH AND MONITORING: A number of studies on various species have been carried out over the last couple of decades. These include :

- K.T.B. Hood, supported by World Wildlife Fund and Royal Society, on effect of livestock grazing on production and species composition of Gir flora, 1968-70 [WP, GOG'72].

- Paul Joslin, Edinburgh University, on the ecology of the Asiatic lion, during 1969-71 [GOG'72].

- Bombay Natural History Society, Smithsonian Institution, and Yale University on a number of topics, under the 'Gir Project' [WP]. This Project started in 1969, and established a Gir Ecological Research Station. Several kinds of research work was carried out under this, most prominent being that of Stephen Berwick of Yale University, on the ecology of wild ungulates, during 1970-72 [WP]. In the same period Nikhil Sanyal, ENHS research fellow, carried out research on the same subject [WP]. S. Chavan was deputed by the Gujarat Forest Department to carry out several small projects between 1970 and 1972, including on browse production and use, pellet group count, rodent populations and their herbage consumption, and plant succession in clearfelled areas [WP]. Robert Grubb of Bombay University, another ENHS research fellow, conducted a study on the ecology of vultures with special reference to their association with the Asiatic lion, between 1970 and 1972 [WP]. The 'Gir Project' ended in 1972.

- S.P. Sinha, Saurashtra University, on the ecology of the Asiatic lion, 1981-84

- A.K. Bannerjee, Saurashtra University, on the ecology of Gir avifauna, 1984 (period ??)

- Ravi Chellam, Wildlife Institute of India, on the ecology of the Asiatic lion with special reference to its predation and ranging patterns, 1986 to 1989 [Chellam].

New status:

There is one ACF posted for research work.

New status:

Monitoring activity in the park is restricted to a census of animals. A census of lions was undertaken in 1936, then again in 1955, 1968, and 1974 [GOG'72]. 1974 was also the year when the first general animal census was carried out [WP]. The latest general census was in May 1990.

Any more:

COMMUNITY INTERACTION PROGRAMMES: Frequent nature camps are organised in the park for school children of surrounding villages [Sinh].

Anything else:

HUMAN PRESENCE:

Rights and Leases: Habitation and grazing rights are said to exist in the area formerly considered the sanctuary. It is, however, unclear how this is possible considering this entire area is Reserve Forest, since under the Indian Forest Act 1927 no rights are allowed in this category of forest. Collection of dry fuelwood is also allowed on the peripheral areas, but is not considered a right [FV]. The only other right is that of religious monuments, at 4 places.

*Tallying
the 7p
inform. with
park data*

Habitation: While the 'finally notified' area of 25,871 ha. is free of human habitation, several (number unspecified) nesses remain in the rest of the park [FV]. These are inhabited by 300 to 350 maldhari families. Relocation of these families outside the park is in progress [FV] (see below on past relocation). There are also some people occupying the temple complexes inside the park, but population figures for these are not available. The surrounding area has 218 villages (population figures not available).

The first attempt at relocation of the Maldharis from the Gir forests was made in the 1950s by the Saurashtra Maldhari Sangh under its Maldhari Settlement Plan [GOG'72]. At the time over 5000 families were relocated on land outside the Gir forests. In the 1960s three additional schemes for relocation were also undertaken, for which there are no details available.

In 1971-72 the Forest Department prepared another scheme after discussions with Maldhari representatives. The scheme envisaged relocating 845 families over a 5 year period 1971-72 to 1975-76 [WP]. Agricultural land, compensation for houses, and community facilities were to be provided to the oustees under this scheme [ERO]. By 1973-74, 90 families had been shifted out [WP].

Update???????

Grazing: The maldharis who live in the nesses inside the park have the right to graze their livestock inside (though not in the area covered by the final notification). Such a right is also enjoyed by graziers of two villages, Liliya and Baredi, situated adjacent to the park, and by the people living in the temple complexes inside the park. Permits for this are issued by the RO (Sasan ??), and grazing is allowed through the year.

About 6000 heads of livestock (including cattle and horses) graze inside, in addition to about 70 camels.

Offences and Illegal Activities: Illegal activities of many kinds are common in the park. Perhaps the most frequent of these are tree-felling

* 'nesses' - small pastoral settlements of cattle graziers (maldharis)

or lopping for timber and fuelwood, and grazing [FV]. Between 1979-80 and 1983-84, 2693 cases of habitat destruction, and 1292 cases of illegal grazing, were detected. Illegal grazing is of two kinds - grazing inside the finally notified national park area (reportedly infrequent), and grazing without permits in the rest of the area (very common) [FV]. Somewhat less common but nevertheless alarming is poaching, especially of deer and antelopes, but also occasionally of lions [Sinha]. Between 1979-80 and 1983-84, 29 cases of illegal hunting were filed. Yet another serious illegal activity is encroachment, *Location on map?* reported to be on the increase in peripheral areas [FV]. A study in 1973 showed encroachment over about 2000 ha. on the southern boundary, mostly for cultivation [Joslin 1973]; no subsequent estimates are available. No action by the park authorities seems to have been taken on this [FV].

Other offences recorded include causing fire hazard - 196 cases of this were filed between 1979-80 and 1983-84.

Status now:

Tourism: Gir's fame as the last home of the Asiatic lion has guaranteed a heavy stream of visitors. The figure for 1983-84 is 12,484. Some 2000 to 3000 students visit the park each year.

Labels:

Use by Other Government Agencies: The Irrigation Department has control over 1813.64 ha. which are covered by reservoirs; these reservoirs are used for irrigation and drinking water supply to habitation outside the park. There are also 6 thoroughfares, covering about 100 km. inside the park, controlled by the PWD. The Forest Department controls about 3 km. of transmission lines, while the Railways have a track running through the park.

Miscellaneous: Labour (number not specified) from outside the park is employed for road maintenance, digging of fire lines, fire fighting, and other such work. In 1983-84 about 1500 labourers were also employed to extract trees uprooted by a cyclone.

Labels:

The park's wild animals do considerable damage to livestock and crops of the maldharis and those of the surrounding communities. There are also occasional reports of humans being injured or killed. The figures for the period 1979-80 to 1983-84 are as follows:

- 1648 cases of lifting of livestock from within the park, and 3322 cases from adjacent areas. Of these, 1138 and 2065, respectively, were accepted for compensation.

- 25 cases of attacks on humans, of which 9 were fatal. 11 of these involved lions, while 14 involved leopards.

The park is also often witness to clashes between wildlife authorities and villagers, mainly over illicit felling, poaching, and illegal grazing. Between 1979-80 and 1983-84, 13 such clashes were reported. In 1987 another major clash took place, in which one villager and one Range Officer were killed [FV].

New Information:

INFORMATION FOR VISITORS: The period from December to February is pleasant, and visibility is good. Wildlife sighting is also good from April to May, though the 40°-plus heat can be quite exhausting.

An area of 400 ha. in the south-west part of the park is being developed as a lion safari park, "where lions and their prey will be seen in enclosures surrounded by a three-metre wall... [ERO]"

On ferry of the West end of the park add location of boundary.
map page 13

mark on map?

There are 22 manned entry points, and permits are required for entering the park in a vehicle. Once inside, vehicular and pedestrian traffic is permitted through the entire park.

For accommodation, there is one bungalow at Tulshishyam (inside the park), and rest houses at Sasan, Jamwala, and Jasadar (on the outskirts).

There is a visitors' orientation centre at Sasan, which contains a photo exhibition on wildlife and other educative material. Nearly 150 film/slide shows are held annually for visitors. Books on wildlife are available for reference, and binoculars for use. A checklist of birds and other animals found in the park can be obtained from the authorities. There are also vehicles which can be hired for visiting the park.

NGOs/INDIVIDUALS ASSOCIATED: Several non-governmental groups and individuals are associated with the park, mainly for educational and research activities. These include *:

- World Wide Fund for Nature - India, Saurashtra Branch
- Jamnagar Nature Conservation Society
- Junagadh Nature Conservation Society
- Bhavnagar Nature Conservation Society
- Environment, Jamnagar

Two Honorary Wildlife Wardens were appointed for the park in 1983-84. (present status not known).

CONTACT ADDRESSES :

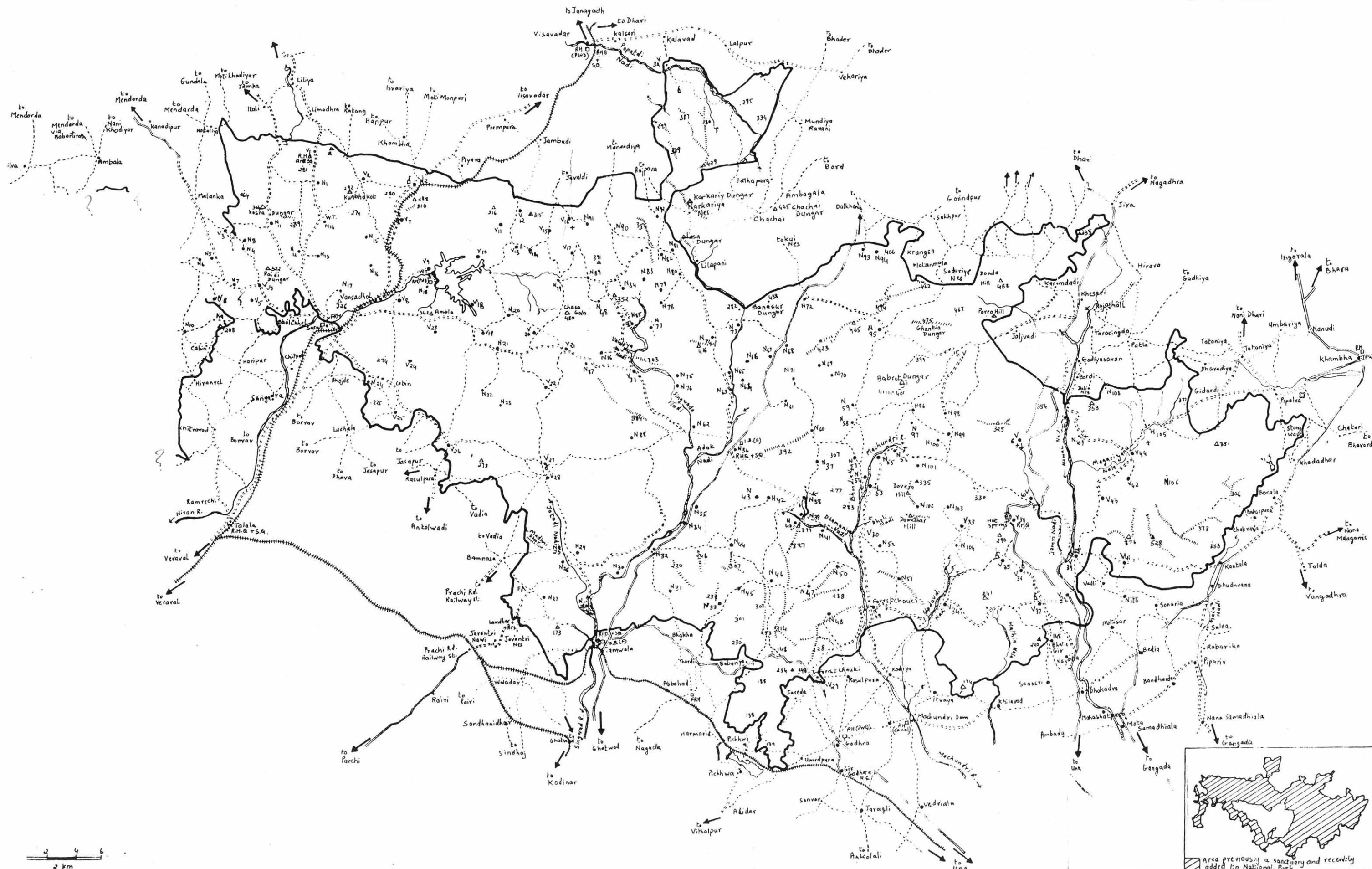
Deputy Conservator of Forests (WL)
Sasan-Gir - Pin??
Dist. Junagadh
Gujarat

Conservator of Forests
Wildlife Circle
Sardar Baug
Junagadh - 362 001
Gujarat

- District? what is std.?
- shd be in line with cat or below?

* Please see Appendix 10 for addresses.

GIR NATIONAL PARK



opochel nos. 41/4/7, 1st ed, 1967; 41/4/11, 1st ed, 1968; 41/4/12, 1st ed, 1966; 41/4/10, 1st ed, 1967; 41/4/13, 1st ed, 1967; 41/4/16, 1st ed, 1971; 41/4/15, 1st ed, 1968; 41/4/14, 1st ed, 1968; 41/4/12, 1st ed, 1967. © map sent by the Gujarat Forest Department, Wildlife Wing, (undated)

To be verified with people ~~At~~ people?

VILLAGES AND NESSES IN GIR NATIONAL PARK

VILLAGES	N7	Sakhtimb	N63	Dungarpar
	N8	Gadkiya	N64	Jambura ???
V1 Dedkadi	N9	Sandhbeda	N65	Bharati
V2 Joriambuthala	N10	Devaliya	N66	Kalva
V3 Karsangadh	N11	Khada	N67	Karjali
V4 Surajgadh	N12	Raidi	N68	Bilivat
V5 Chhatriya	N13	Kadeli	N69	Lotha
V6 Gudjujra	N14	Dudhala	N70	Jadajambu
V7 Alawani	N15	Khakhrawali ??	N71	Sudavi
V8 Waladhra	N16	Nanawa ??	N72	Sap
V9 Kathitad	N17	Pilipat ??	N73	Rampari
V10 Panvi	N18	Kamleshwar	N74	Bhanta
V11 Barwaniya	N19	Jamri	N75	Bagadia ???
V12 Kutiya	N20	Karamdadi	N76	Kobli
V13 Timba	N21	Nimma	N77	Kadwali
V14 Bhilgaia	N22	Rhakhrawali	N78	Jadajambu
V15 Makhniya	N23	Kisa	N79	Sapar ???
V16 Manapad	N24	Kapuriya	N80	Amliwala
V17 Khajuri	N25	Samasar	N81	Laha
V18 Pipatliag	N26	Motidi	N82	Suwardi
V19 Vadvangda ?	N27	Aamarvel	N83	Jalambu
V20 Dayra Timba	N28	Bateshwar	N84	Rainalo
V21 Devkarniya	N29	Chaprawali	N85	Sokra
V22 Wansali	N30	Asaliya ??	N86	Valoliya
V23 Junwaniya ?	N31	Dad	N87	Miyakuwa
V24 Anbliola	N32	Dabhala	N88	Ravta
V25 Amritvel	N33	Khokra	N89	Goradwala
V26 Sirwan	N34	Waghatimba	N90	Bajriya
V27 Beliyat	N35	Kalipat	N91	Haladarwa
V28 Janwadla	N36	Chhodamdi	N92	Ambliyala
V29 Jakhiya	N37	Dhamaniya	N93	Waghari
V30 Kardapan	N38	Charchok	N94	Shemardi
V31 Kankai	N39	Banej	N95	Jamwali
V32 Jadodhar	N40	Bhuragala	N96	Gola (i) ???
V33 Khajuri	N41	Bordipat	N97	Gola (ii) ???
V34 Ghodavadi	N42	Abut	N98	Ranvala Ara
V35 Mota Mendha	N43	Panwali	N99	Jainagar
V36 Nana Mendha	N44	Khacharwala	N100	Damsa
V37 Sarakadiya	N45	Sorauda	N101	Pareva
V38 Tulshishyam	N46	Patla Mahadev	N102	Gedgok
V39 Sikhalkuba	N47	Viragala	N103	Kasyala
V40 Dodhi	N48	Roshall	N104	Bobadiya
V41 Kothariya	N49	Mandvi	N105	Bhaniva
V42 Rajasthali	N50	Tatala	N106	Chapra
V43 Hanumanvaldadiya	N51	Oyana ???	N107	Loki
V44 Rehadi	N52	Kanek ???	N108	Rajgaria
V45 Timbarya	N53	Motidi ???		
	N54	Kalikat ???		
NESSES	N55	Moadi ???		
	N56	Aral ???		
N1 Dudhala (i)	N57	Talika ???		
N2 Kansia (Railway Stn)	N58	Lapatni		
N3 Jambudi	N59	Wankajambu		
N4 Kiloriya	N60	Vakumba		
N5 Waniyaavav	N61	Sudava		
N6 Kathala	N62	Bhuwatirath		

? It is uncertain if these are still inhabited.

?? These nesses are marked as temporary settlements, and it is uncertain if these are still inhabited.

??? It is not known if these are used, since the mark put against them on the Survey of India map is unclear.

MARINE NATIONAL PARK AND SANCTUARY*

well known

One of only four marine reserves in India, this national park and sanctuary are spread along the southern waters of the Gulf of Kutch. The reserve also contains about 40 islands, the most famous of these being Pirotan. The area is considered an important repository of marine flora and fauna, including significant (though reportedly declining) numbers of sea turtles, and coral reefs that are 120,000 years old [Sinha]. The erstwhile rulers of the former Jamnagar State used to carry out pearl oyster fishing here several decades back, and the Fisheries Department of the Government of Gujarat is now trying out the viability of farming pearl oysters.

Some of the islands in the park/sanctuary are pilgrimage spots, where pirs and temples are located.

Unfortunately, the park and sanctuary ~~are today~~ ^{have been} severely threatened by human activity, including industrial pollution, dredging, shipping, and oil spillage. *Satellite data shows that coral reef area was reduced from 11600 ha. in 1975 to 5300 ha. in 1985, due mainly to mud deposition over the reef area [Sinha et al. 1989], but that subsequent protection had led to an increase in the area to 8300 ha. by 1988. [Nayak et al. 1989]. Similarly, area covered with mangroves decreased from 13800 ha. in 1975 to a mere 3300 ha. in 1985, and ~~but~~ recovered marginally to 4700 ha. by 1988. Expansion of salt pans, oil pollution, fuelwood collection have been major destructive factors [fv].*

LEGAL STATUS : Notified a sanctuary on August 12, 1980, vide Notification No. AKH-140.80-WLP-1079-109433-P2 [Parmar]. Some claims have been settled, an inquiry into others is in progress. Part of area notified a National Park on June 20, 1982, vide Notification No. AKH-138(2)-182-WLP-1081-126827-V2 [Parmar], the final notification being issued on the same day as declaration of intention to constitute it as such.

AREA AND ZONING : Sanctuary : 29,503.00 ha. (295.03 sq.km.) [ERO/MAR 31]
National Park : 16,289.20 ha. (162.89 sq.km.)

Area of sanctuary as originally declared was 27,132.18 ha. To this was added an area of 23,721.06 ha. on July 20, 1982, vide Resolution No. AKH-138(1)-182-WLP-1081-126827-V2. Simultaneously, an area of 3157.77 ha. was deleted as it was on lease for salt works; another 1904.76 ha. were deleted due to change in originally proposed boundaries of the sanctuary (information on the notifications which contained these deletions and the revised boundaries is not available).

(There is a discrepancy in sanctuary area - if all the additions/deletions to original area are calculated, and the area of national park deleted, the sanctuary area comes to 29,501.51 ha., not 29,503.00 ha.; and the total area of park and sanctuary comes to 45,790.71 ha., not 45,792.00 ha. as given in all documents).

There is no zoning. AKH-138-(2)-82-WLP-1081-126827-V2 → Area of NP = 16289.20 ha = 162.89 sq.kms

(qa 91) AKH-138-(3)-82-WLP-1081-126827-V2
(20-7-82) Area of S = 22071.50 ha = 220.71 sq.kms

* While the national park and sanctuary are two separate legal entities, much of the information on them is commonly applicable. Thus both have been included into one sheet, though where possible and necessary, information is given separately.

1980 - 27132.18 ha 15 originally
1982 - 5060.68 ha deleted AKH(3) Total area of sanctuary = 45,792.56 ha
23721.06 ha added (AKH(1)) [qa 91]

Marine Park and Sanctuary

LOCATION : District : Jamnagar

Latitudinal Range : Approx. $22^{\circ} 14' 20''$ to $22^{\circ} 50' 00''$ N [Tp]

Longitudinal Range : Approx. $69^{\circ} 14' 19''$ to $70^{\circ} 25' 29''$ E [Tp]

Nearest Town : Jamnagar (7 km.)

Nearest Railhead : Jamnagar (7 km.)

Nearest Airport : Jamnagar (7 km.)

APPROACHES : From Ahmedabad to Jamnagar (308 km.), then on to Bedi Port (7 km.), at edge of sanctuary. Bander on map

From Bombay to Jamnagar by air, then as above?

(Since the park and sanctuary are spread along the coast, they can be entered from any point on this coast or from the Gulf of Kutch. However, since permission for entry is available only at Jamnagar, the approach nearest to this town is the only one given).

TOPOGRAPHY AND CLIMATE :

Highest Point : 21 m [Tp]

Lowest Point : 0 m

Maximum Temperature : 42 C

Minimum Temperature : 2 C

Mean Annual Rainfall : 1052 mm

FLORA : The area is largely ^{off shore} a marine wetland, with some vegetation ^{and corals} along the coast, or on and fringing the islands [FV]. The forest types found are Mangrove Scrub 4B/TS1, Mangrove Forest 4B/TS2, and Salvadora Scrub 6/E4.

Habitat destruction poses a threat to much of the area's flora. Specifically, Avicennia marina, Rhizophora mucronata, Commiphora wightii, Acacia senegal, Ceriops tagal, Bruguiera gymnorrhiza, Sonneratia apetala, Aegiceras corniculatum have been identified as threatened due to cutting for fuelwood by the local population and grazing by camels [BRO/MAR 3, Q1].

Attempts have been made to revive mangrove forests by plantation, mainly of Avicennia marina [Anon]. About 30 ha. were planted in 1982-83 on Pirotan Island, and this plantation has been fairly successful [Anon]. In addition, for several years now every batch of nature education camp participants (see below, HUMAN PRESENCE) has been planting a few seedlings of mangrove species. In 1986-87, 250 ha. of the sanctuary area was planted with Avicennia spp., Cerriops spp., and Rhizophora mucronata as part of a coastal afforestation programme.

FAUNA : Though undoubtedly considerably diminished by habitat destruction, the sheer diversity and richness of fauna in this area remains remarkable.

MAMMALS [Q1; Anon; Parmar; Chavan]

Boar, Indian Wild -?

Dolphin, Common -?

Dugong -? (maybe)

Jackal

Whale, Blue -? (I am quite certain a whale, even the smallest require more than shallow mud puddles. Maybe whale have been seen in the Gulf of Kutch water -? outside the park/san. area.)

REPTILES [Q1; BRO/MAR 3; Anon; Parmar; Chavan]

Snake, Blackbanded Sea ?

Turtle, Green Sea

Turtle, Leathery

Turtle, Olive Ridley

Viper, Sawscaled

The Green sea turtle, Olive ridley turtle, and Leathery turtle are reported to be threatened due to disturbance, egg poaching, pollution and habitat destruction. Corals and mollusca (including pearl oysters and shells) are also reported threatened, due to dredging by cement companies, over exploitation by the Fisheries Department, and illegal collection. Branch corals (Acropora spp.) may already be locally extinct [BRO/MAR 3]. Dugongs may well be on their way to extinction in this area, as they have not been seen alive in recent times, but a few dead bodies have washed ashore at long intervals [FV].

The Blackbanded sea snake, Hydrophis nigrocinctus, is mentioned in Whitaker's 'Common Indian Snakes' (Whitaker 1978) as being found in the Bay of Bengal. Its occurrence in the Gulf of Kutch is therefore uncertain.

(See Annexure for full list of threatened animals).

In 1982-83 a breeding programme for Green sea turtle and Olive ridley turtle was started. This included egg collection, hatching, and release. The present status of the released turtles is not known. A full-fledged turtle breeding station is planned [Chavan]. *Any further news on this?*

OCCURRENCE AND CONTROL OF DISEASE : No disease of flora and fauna has been reported. A veterinarian has not been considered necessary.

OTHER FACTORS AFFECTING HABITAT : Cyclones, once in ~~3-4~~ ^{three the past} years, caused considerable damage to the ecosystem. Hot winds occur in April-May. Droughts on the mainland have an impact on the marine ecosystem, as pressure on the mangroves for fuelwood and fodder increases [FV]. *how*

Water pollution from various sources is a serious problem. Oil spills and leakage from ships and the terminal at Vadinar Port, refuse dumped by ships, chemical effluents released into the Gulf waters by factories situated on the coast, and saline effluent from salt works, are all reported to cause severe havoc. However, no study on the impacts of these pollutants on the wildlife and the habitat has been made. As ameliorative measures, salt work lessees have been asked to reprocess their effluents, factories to install treatment plants, and ships to control their oil leakages. Limited success at controlling pollution has resulted, but continued industrialisation along the coast and plans for increasing the shipping/docking facilities threatens to reverse this trend [FV]. (See also below, HUMAN PRESENCE).

WATER RESOURCES : Virtually ^{seasonal} the only fresh water available in the park/sanctuary is from a lake and some wells on Ajad Tapu (Island), a small ~~perennial~~ lake on Panero Island, and some seasonal streams on a few other islands [Tp, FV]. *seasonal* *no on Tp?*

BUDGET : Rs.15,22,000.00 for 1987-88 (up from Rs.15,00,000.00 in 1986-87) [Statebudget].

MANAGEMENT PLAN : None

New Staff position:

Marine Park and Sanctuary

PERSONNEL : One Conservator of Forests, who also holds charge for Khijadiya Sanctuary, is locally in charge. In addition, there are one Assistant Conservator of Forests, three Range Officers, two Foresters, three Orderly Guards, two armed Police Constables, one tracer, two surveyors, one helper, one mechanic, four jeep drivers, one sweeper, one watchman, one Research Officer, two boat drivers, two tandels (boat captain), three khalashis (boat labourers), and 15 office staff. There is also one Deputy Collector and one Deputy Mamlatdar (???) attached to the park/sanctuary [State staff].

*Tehsilidar (Revenue Deptt)
Nothing to do with Park*

EQUIPMENT : One rifle, ^{nine} 9 pairs of binoculars, two telescopes, one van, one car, two motorcycles, five boats (including four motorised), one mini bus, and one jeep.

RESEARCH AND MONITORING : James Hornell of Sri Lanka surveyed and recorded the marine fauna of the Gulf of Kutch way back in 1905 [Chavan]. Scientists Shailesh Nayak, Anjali Pandaya, and J.P. Aggarwal (affiliation not known) studied ecological changes in the park/sanctuary area using satellite data and imagery for the decade 1975-1985 [Anon]. The National Institute of Oceanography and CMFRI, Cochin carried out detailed studies of the marine ecosystem (in year ??) [Anon]. Edible oysters were the subject of a research undertaken by Harsh Dave (affiliation unknown), completed in 1981, and M.I. Patel of the Fisheries Department studied fish fauna between 1980 and 1982 [Anon]. The Department of Bio-science, Saurashtra University, finished studies on the Reef heron in 1983 [Anon].

At present, the following research is under way : M.I. Patel on pearl oysters and corals, researchers from Saurashtra University on mud-skippers and molluscs, Taej Mundkur from Saurashtra University on birds of saltworks, and Rishad Pravez, also from Saurashtra University, on prawns and prawn fishing.

*has studied
has studied*

? A Research Centre with a laboratory is planned [Chavan].

COMMUNITY INTERACTION PROGRAMMES : Awareness programmes have been carried out for inhabitants of about 20 villages of the adjacent areas, with slide shows, lectures, and visits to the park/sanctuary.

HUMAN PRESENCE :

Rights and Leases : Villagers have the right to extract minor forest produce and fodder from the sanctuary, as also to religious yatra. Religious monument rights also exist on many of the islands where pirs are located.

The situation regarding the national park is unclear. All the above-mentioned rights, as well as those of habitation and agriculture (on 70 ha.) on Ajad Tapu, cannot legally exist within a finally notified national park. Yet they are still considered as such, by the villagers as well as the park authorities. This anomaly may have arisen due to the fact that there was no time gap between declaration of intention to notify the area into a national park, and the final notification, so the acquisition procedures may not have been carried through at all [FV].

Several leases for saltworks have been given in the park/sanctuary, along the coast [Parmar]. In addition, during the drought of 1986-87 and 1987-88, the Government of Gujarat allowed fodder collection from the mangroves along the coast. Over 50,000 permits for such collection were reportedly issued by the CF Jamnagar in just two months of 1988 [FV].

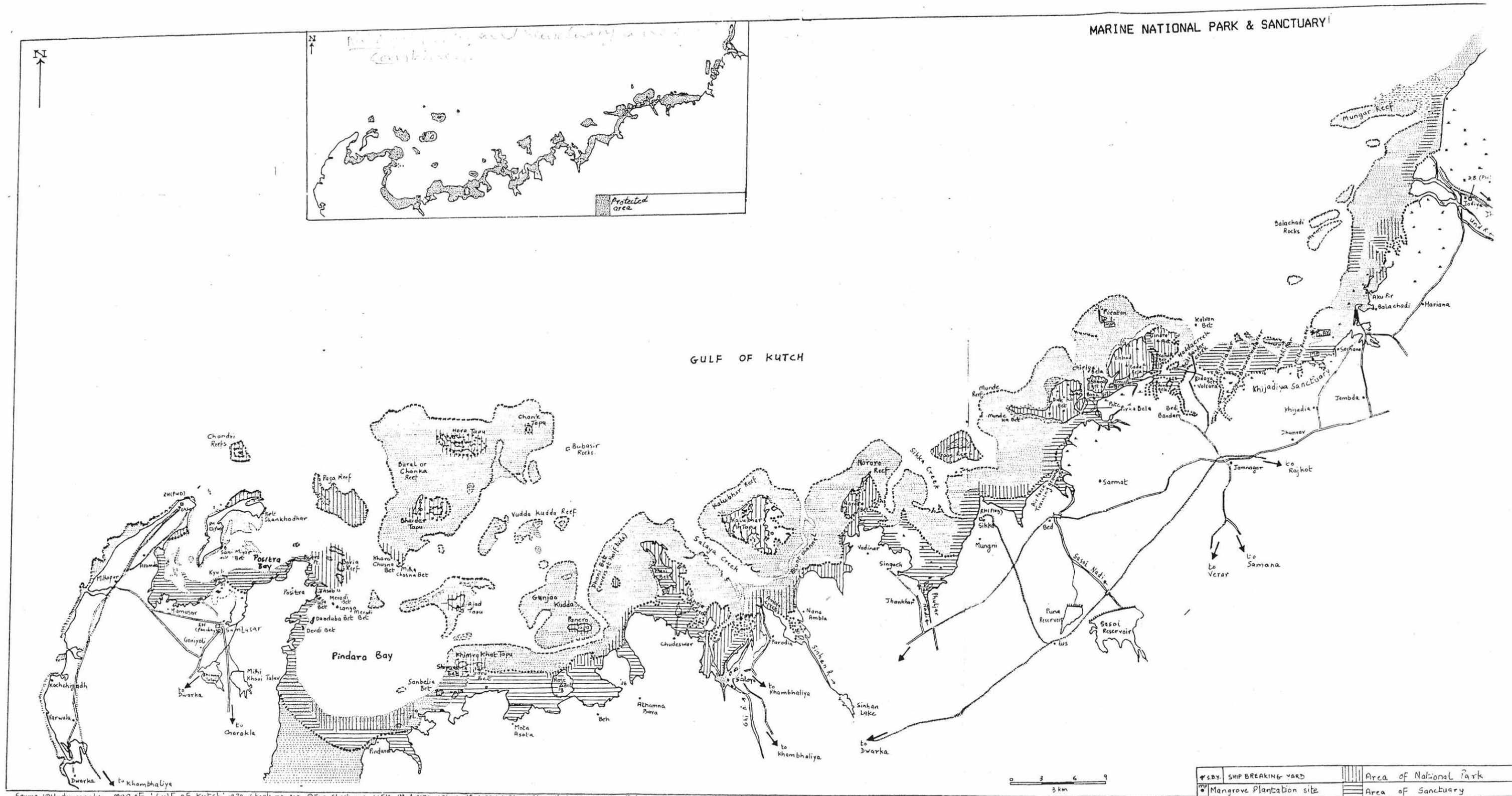
Permission for entry must be taken from the OF Jamnagar.

Accommodation inside the park/sanctuary is restricted to two wooden cabins with space for ^{three} (3) persons each, on Pirotan Island. In adjacent areas of the park/sanctuary, there are several guest houses and hotels at Jamnagar, and one rest house each at ^{Calpur Ga} Dwarka and Okha.

The following facilities/materials are available at the OF Jamnagar's office for use by tourists : booklets on the park/sanctuary (for free distribution), tape recordings of bird calls, slides, films, and books on wildlife, photo exhibition on wildlife, museum of species, binoculars (to borrow), checklists of birds and other animals (for reference), and boats and a station-wagon (for use in the area). Also planned are a larger marine life and resources museum, an oceanarium, and a dolphinarium [Chavan]. There are two temples on islands in the park.

NGOs/INDIVIDUALS ASSOCIATED : Many groups and individuals organise or assist in nature education camps and other such activities. These include the World Wide Fund for Nature-India (Jamnagar and Rajkot branches), Gram Jivan Vikas, Jamnagar, the Jamnagar Nature Conservation Society, and the Nature and Adventure Club, Jamnagar.

CONTACT ADDRESS : Conservator of Forests,
Marine National Park
Government Quarters
Pradarshan Ground
Jamnagar - 361001
Gujarat



Check the boundaries of NP & San:

ANNEXURE

Threatened Species of the Marine National Park and Sanctuary [ERO/MAR 3]

Plants

Aegiceras corniculatum
Bruguiera gymnorrhiza
Sonneratia apetala
Rhizophora mucronata
Ceriops tagal
Commiphora wightii

Animals

Mollusca

Shell, Strombus Conch
Shell, Sacred Conch
Shell, Spider Conch
Shells, Murex
Oyster, Pearl

Strombus gigas
Jancus purus
Lambis spp.
Murex spp.
Pinctada fucata

Other Marine Animals

Coral
Bonnellia

Acropora and Porites spp.
Ikedella spp.

Reptiles

Turtle, Leather
Turtle, Green Sea
Turtle, Olive Ridley

Dermochelys coriacea
Chelonia mydas
Lepidochelys olivacea

Birds

Heron, Little Green
Redshank, Spotted
Greenshank
Shag, Indian
Darter

Ardeola striatus
Tringa erythropus
Tringa nebularia
Phalacrocorax fuscicollis
Anhinga rufa

VELAVADAR NATIONAL PARK

As the national park with the largest concentration of Indian antelope (Blackbuck) in India, and as one of Western India's last protected grassland ecosystems, Velavadar has great significance. The area it occupies was once a grass vidi* of the erstwhile rulers of Bhavnagar state, till the state's merger with the Indian Union in 1948. Elderly residents of the area testify to a time, perhaps no more than two decades ago, when the grass here was taller than a horse, and when there may have been upwards of 15,000 Blackbuck. Today, the habitat is considerably worn-out, and the Blackbuck population hovering around a thousand. Local villagers have been greatly protective of the antelopes, and continue to support conservation efforts even though crop raiding by the Blackbuck has been causing them economic damage of late.

Velavadar is also important for its small but stable population of the Wolf, one of the country's most endangered mammals. But it is really the sight of several hundred Blackbuck gathered together, their amazing spiral horns standing against the sky, which gladdens the visitor's heart and strengthens the resolve to do all one can to protect this home of theirs.

LEGAL STATUS : Notified a sanctuary on April 8, 1969. Intention to declare this area a national park was declared on March 6, 1975, and final notification issued on July 21, 1976. Intention to constitute an additional area (1624.23 ha.) into a national park was declared on June 26, 1980.

AREA AND ZONING : 3408.11 ha. (34.08 sq.km.)

The sanctuary, as initially declared, spread over 890.88 ha, to which was added 893 ha. when the area was intended to be declared a national park in 1975. In 1980, another 1624.23 ha, were added, vide notification no. AKH/176/60/WLP/1080/89485/P2.

There is no zoning.

LOCATION : District : Bhavnagar

Latitudinal Range : Approx. 22° 00' to 22° 07' N

Longitudinal Range : Approx. 72° 00' to 72° 16' E

Nearest Town : Vallabhipur (32 km.)

Nearest Railhead : Dhola Junction (52 km.)

Nearest Airport : Bhavnagar (72 km.)

APPROACHES : From Ahmedabad to Bhavnagar (200 km.), then on to park (72 km.) by private transport or Departmental vehicle
From Bombay to Bhavnagar by air, then on as above.

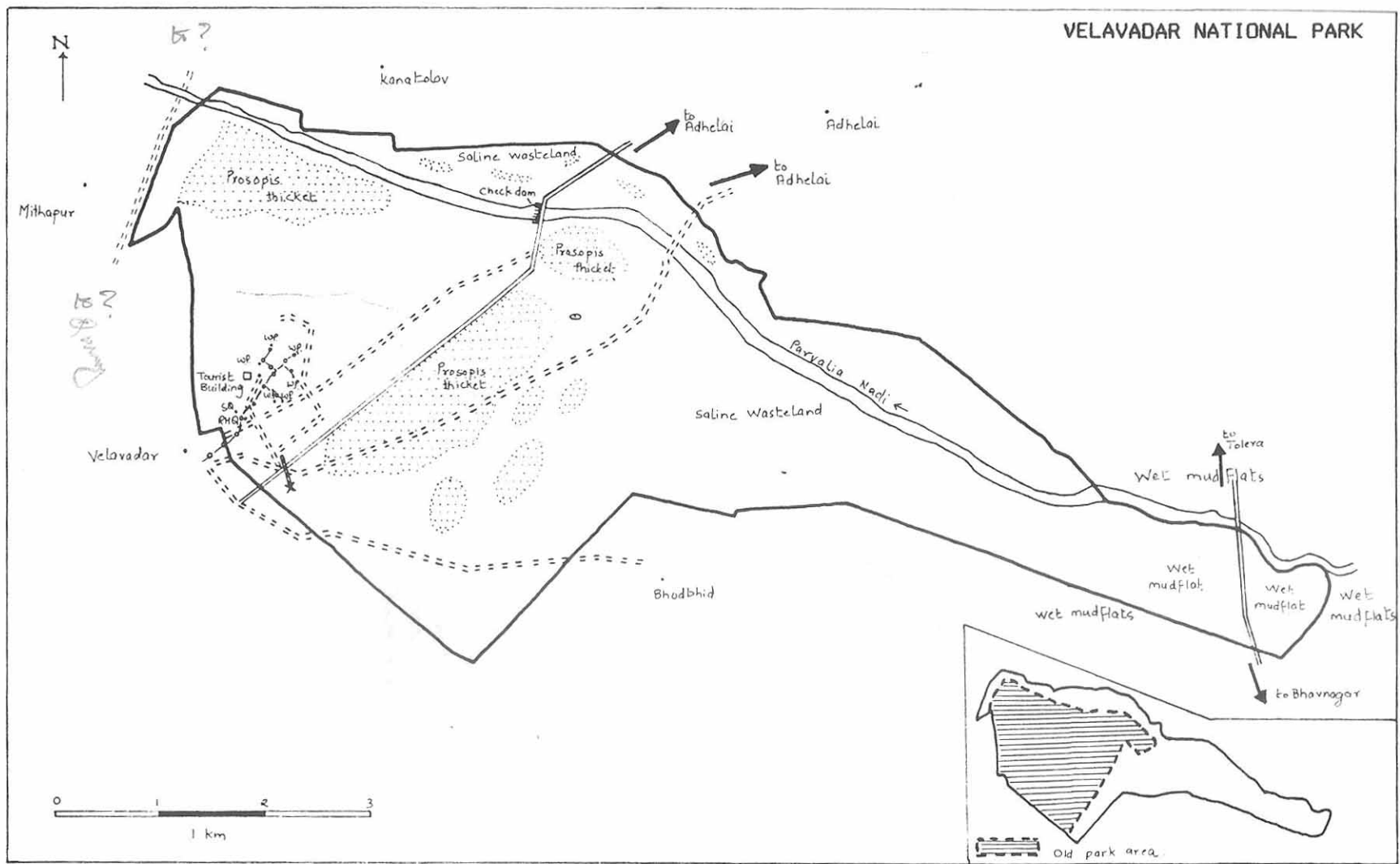
TOPOGRAPHY AND CLIMATE : Highest Point : Approx. 5 m [FV]
Lowest Point : 0 m

Maximum Temperature : 42° C

Minimum Temperature : 12° C

Mean Annual Rainfall : Approx. 600 mm

* vidi - grassland from where fodder was cut and supplied to the royal household's or other livestock.



FLORA : The park is partly a grassland, with patches of sparse thorn forest, and a large stretch of saline flatland on which almost nothing grows. The extreme eastern portion, adjoining the sea, has some mud flats [FV]. The grassland has become considerably degraded over the last few years; elderly citizens of adjoining villages recall that less than 2 decades back, the grass grew so tall that a person riding on horseback could easily get hidden in it [FV]! A doctor, who came to Velavadar village in the late 1960s, stated that it was often difficult to find his way through the grasslands when he had to visit patients in neighbouring villages [FV]. Today, the grass remains short and stunted, and there are huge bald patches [FV]. The exact reasons for this degradation are not known. — Too much of sea water, more than before covering the land above

The park, with forest patches interspersed with the grasslands, consists entirely of Northern Tropical Thorn Forests 6B. Tree cover appears to have grown considerably in the last few years with the accidental introduction of Prosopis juliflora [FV]. This exotic tree has rapidly invaded the grasslands and grows in scattered thick clumps, covering some 700 ha. of the park [FV]. Recent efforts at manual uprooting have succeeded in arresting further rapid expansion.

Habitat degradation and invasion by Prosopis juliflora may be threatening the existence of a number of indigenous plants in the park. Among these may be the trees Prosopis cineraria and Acacia nilotica, and the grasses Dicnanthium annulatum and Cynodon dactylon.

A few years back (exact date not known) edible crops were planted inside the park, to supplement fodder availability for herbivores. However, these plantations failed. There is now a proposal to plant edible grass species on the grasslands [FV]. — status now?

FAUNA : Blackbuck is the most conspicuous animal in the park, but a number of other species co-exist with it [FV].

MAMMALS [Q1; FV]

Antelope, Indian (Blackbuck)
Bull, Blue (Nilgai)
Cat, Desert
Cat, Jungle
Fox, Indian
Hare, Indian
Jackal
Mongoose, Common
Porcupine, Indian
Squirrel, Fivestriped Palm /
Threestriped Palm ?
Wolf

REPTILES

Boa, Russel's Earth/John's Earth ?
Cobra, Indian
Krait, Common Indian
Monitor, Common Indian
Snake, Common Rat
Snake, Common Wolf
Viper, Sawscaled

Blackbuck are given a daily feed of grass and stalks in summer. This is both to supplement naturally available fodder as well as to keep the animals from raiding adjacent fields. During the severe drought of 1987-88, artificial feeding was done almost through the year [FV].

Drought, habitat degradation, and other factors are reported to have threatened the survival of several animal species [FV]. There has been no recent sighting of the Desert cat; snakes and other reptiles are far less commonly seen; the number of birds of prey appears to have fallen considerably [FV]. These observations, however, are impressionistic and short-term; more detailed studies need to be done to determine the actual trends. The Blackbuck itself has declined from 1554 animals in 1977 to 1218 in 1983, but this could largely be due to devastating floods in 1982-83 (see below, OTHER FACTORS AFFECTING HABITAT).

OCCURRENCE AND CONTROL OF DISEASE : In 1983-84, about 400 Blackbuck were affected by foot and mouth disease (FMD). A medicinal powder was mixed in the water tanks from where Blackbuck drink, to counter further spread of the disease [FV]. Another remedial measure has been the vaccination of about 80% of the cattle in surrounding villages against FMD. The nearest veterinarian is located at Velavadar, one km. away.

Medus now?
OTHER FACTORS AFFECTING HABITAT : Drought is a recurrent phenomenon in the park, the worst years in recent times being 1985-86 to 1987-88 [FV]. Additional water points, artificial feeding of wild animals, and hiring a tanker to bring water from Bhavnagar have been some of the counter-measures taken by the park authorities.

Fire and floods occur occasionally. In 1982-83, cyclonic rains caused devastating floods which killed many animals. Ironically, the heavy rains leading to floods also led to lush growth of grass which, when dry, was prone to catching fire. In 1983-84 fire affected 80 ha. of the park. About 2 km. of firelines have subsequently been made to check further fires, and a few areas raised for animals to move onto in case there is a flood.

The eastern part of the park has a large creek (Parvalia Nadi) entering it from the Gulf of Khambhat [FV]. The saline water that run into it pierces deep into the park, mixing with freshwater sources an increasing soil salinity. This factor is especially strong in the drought years, when there is little rain water to push back the sea. A check-bund has been constructed on the creek to reduce the salt-water inflow [FV].

The park is also affected by hot winds, which blow in April-May.

only six on map?
WATER RESOURCES : There are, apart from the seasonally freshwater Parvalia Nadi, 8 seasonal waterholes (artificial) and one seasonal stream. Tankers supplement water when necessary.

BUDGET : Rs. 4,88,000.00 for 1987-88 (down from Rs. 6,77,000.00 in 1986-87) [Statebudget].

MANAGEMENT PLAN : None. In its absence annual schemes form the basis of management.

PERSONNEL : One Assistant Conservator of Forests, one Range Officer, three Foresters, eight Forest Guards, one jeep driver, two police constables, and six office and kitchen personnel. The Range Officer, stationed at Village Velavadar, is locally in-charge.

EQUIPMENT : Two rifles, one gun, a pair of binoculars, three motorcycles, and one jeep.

RESEARCH AND MONITORING : Research on various aspects of the ecology of Blackbucks has been carried out by :

- M.K. Ranjitsinh, for a Ph.D. under Saurashtra University, in the period ??
- Elizabeth Mungel, of Texas, in the period ??
- Students of Bio-science; Rajkot University, for M.Sc. dissertation, in 1984-85.

A census is carried out every 5-6 years, the first one in 1977, then in 1983 and 1988.

COMMUNITY INTERACTION PROGRAMMES : None

HUMAN PRESENCE :

Rights and Leases : Villagers from surrounding areas have right of way [FV]. For this purpose, there are two kuchha and two pukka roads going through the park. A small plot of privately owned agricultural land (area not known), is in the process of being acquired.

Habitation : While there is no human population within the park, the surrounding area has 5 villages with a population of about 7,000 (1983-84 figures).

Grazing : There is illegal grazing by about 50 cattle from adjoining villages, as well as by a few (exact number not known, but negligible) horses.

Offences and Illegal Activities : Grazing is the only significant offence recorded in the park, with 83 cases being filed between 1980-81 and 1983-84. In 1983-84, one case of causing fire hazard was also filed. The illegal grazing cases are usually compounded.

Tourism : A total of 2965 visitors came to the park in 1983-84, with the number going up to about 70 on peak days. *New status?*

Show on map?
Use by Other Government Agencies : The Gujarat Water Supply and Sewage Board has a pipeline running across one km. of the park. About 8 km. of roads are controlled by the PWD. The Gujarat Electricity Board has 8 km. of transmission lines inside.

The kuchha and pukka roads passing through the park carry some 30,000 people per year. While one of the pukka roads, from Velavadar to Adhelai, does not as yet carry very heavy traffic, this may change drastically if a proposal to build a bridge across the Gulf of Kharbhat (as part of a connection between S-W Gujarat and Bombay) is accepted [FV]. As the Velavadar-Adhelai road connects directly on to the major road running along the coast, it will then get linked to the proposed bridge [FV].

Miscellaneous : Labourers (number not known) are employed in the park for providing artificial feeding of Blackbucks, and for other work.

Some amount of killing or injuring of livestock by wolves is reported, but no claims have yet been filed. There is considerable crop damage by Blackbuck and other herbivores. Once again, however, claims have not been filed by affected villagers [FV]. Crop-raiding by wild herbivores is said to increase greatly in drought years [FV]. Attempts by park authorities to reduce this include provision of fodder to Blackbuck inside the park, a trench along 15 km. of the Western boundary

and a live fence of Prosopis along the boundary with Velavadar and Mithapur villages, and plantation of crop species inside the park. This last measure failed completely and the others have been only partly successfully.

While relations between park authorities and villagers have generally been cordial, in 1984 there was a clash between officials and Maldhari graziers over a case of illegal grazing.

INFORMATION FOR VISITORS : November to February is the best period for visiting the park, as the weather is pleasant.

Visitors in vehicles or on foot require entry permits. However, while one of the entry points is manned, there are many other unmanned ones [FV]. Entry is prohibited between 6 PM and 7 AM.

There is one rest house inside the park, near Velavadar village, with 10 beds.

Members of the park staff act as guides to show visitors around [FV]. Reference books on wildlife and binoculars are available for use. There are also two watch towers for visitors' use.

Nature education camps are organised once a year for children from neighbouring villages and other areas of Bhavnagar District.

NGOs/INDIVIDUALS ASSOCIATED : The Bhavnagar Conservation Society occasionally helps in nature education camps and other awareness programmes at the park.

CONTACT ADDRESSES :

Conservator of Forests
Wildlife Circle
Sardar Baug
Junagadh - 362 001
Gujarat

Assistant Conservator of Forests
Velavadar National Park
Bhavnagar - 364 001
Gujarat

Range Officer, Velavadar National Park
At. Velavadar (Ehal)
P.O. Vallabhipur
District Bhavnagar - 364 313
Gujarat

BARDA SANCTUARY

Perhaps the only feature to distinguish this rather degraded sanctuary is that it was once slated to be the alternative home for the Asiatic lion. The proposal to relocate some of Gir's lions to Barda was, however, dropped as the habitat and natural prey availability were found to be too poor to sustain a lion population.

The Barda forests were, till 1948, a part of the private reserves of the erstwhile States of Junagadh and Jamnagar. In 1961, they were given Reserve Forest status.

LEGAL STATUS : Notified a sanctuary on February 12, 1979.

AREA AND ZONING : 18,025.13 ha. (180.25 sq. km.)

The area, as originally declared, was 19,231.39 ha. However, 1,206.31 ha. of this area is not in the hands of the Forest Department (see below, 'Rights and Leases' and 'Use by Other Government Agencies' in HUMAN PRESENCE). 1,206.31 ha. deleted from Sanctuary area (mining leases + ridges) current area = 18025.13 ha (q a 91)
(Discrepancy of 0.05 ha. ??)

LOCATION : Districts : Junagadh, Jamnagar

Latitudinal Range : 21° 42' 11" to 21° 54' 25" N [Tp]

Longitudinal Range : 69° 39' 55" to 69° 49' 00" E [Tp]

Nearest Town : Ranavav (8 km.)

Nearest Railhead : Ranavav (8 km.)

Nearest Airport : Porbandar (24 km.)

APPROACHES : From Ahmedabad to Rajkpt (216 km.), and on to Ranavav by NH 86 (169 km.) or by train (?? km.), then to sanctuary (8 km.)

From Bombay to Porbandar by air, and on to sanctuary (24 km.)

TOPOGRAPHY AND CLIMATE : Highest Point : 627 m [Tp]

Lowest Point : approx. 50 m

Maximum Temperature : 42° C (Ranavav - 42.2 C) [WP] ??

Minimum Temperature : 10° C (Ranavav - 12 C) [WP] ??

Mean Annual Rainfall : 815 mm (Ranavav - 817 mm) [WP] ??

FLORA : The vegetation is reported to be of a fairly degraded nature [Pers. comm., S.A. Chavan]. The major forest type found is Northern Tropical Thorn Forests 6B.

Between 1979-80 and 1983-84, 1050 ha. were planted with Acacia nilotica, Acacia senegal, Cassia fistula, Leucaena leucocephala and other species.

* gaucher : grazing land

Lantana camara is reported to have spread throughout the area, leading to habitat degradation. Manual cutting of this weed has been undertaken in some of the area.

FAUNA : This rather degraded ecosystem does not now harbour much large mammalian life, nor possibly many other wild animals [Pers. comm., S.A. Chavan].

Mammals

Boar, Indian Wild
Bull, Blue (Nilgai)
Cat, Jungle
Fox, Indian
Hyena, Striped
Jackal
Leopard
Sambar

Reptiles

Crocodile, Freshwater

Available
now?

The sanctuary is reported to harbour over 200 species of birds, but no checklist is available. (checklist enclosed q/a 91)

OCCURRENCE AND CONTROL OF DISEASE : No disease has been recorded among flora and fauna. The nearest veterinarian is located at Ranavav, 8 km. away.

OTHER FACTORS AFFECTING HABITAT : Drought is a recurrent phenomenon [Pers. comm., S.A. Chavan].

Pl. show
location of
these on map?

WATER RESOURCES : Nine perennial and 10 seasonal tanks (artificial), two perennial and three seasonal lakes, three seasonal waterholes (artificial), and two perennial streams comprise the water sources in the area.

Latest?

BUDGET : Jointly with what was formerly Gir Sanctuary (see under GUJ/N/GIR), Rs. 19,12,000.00 for 1987-88 (down from Rs. 28,70,000.00 in 1986-87) [Statebudget]. 1989-90 = Rs 2,83,710.00 (q/a 91)

Status now?

MANAGEMENT PLAN : A plan prepared in 1981 is awaiting approval. In the absence of an approved plan, management is done on the basis of annual schemes. Management plan not in use (q/a 91)

Latest?

PERSONNEL : One Assistant Conservator of Forests, one Range Officer, two Foresters, two Forest Guards, and three office staff members.

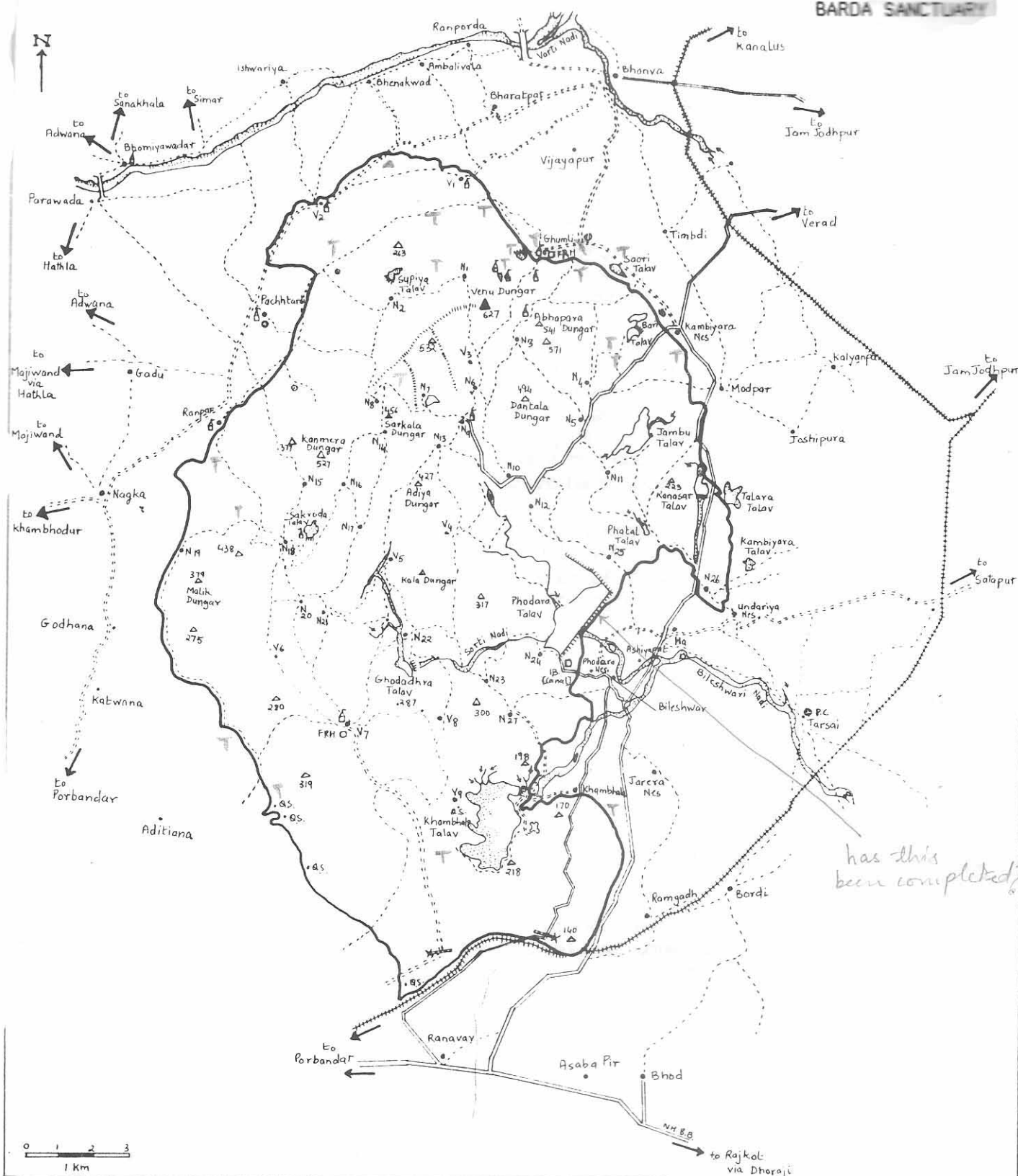
One accountant, one clerk, one peon ← Posts also sanctioned for watchman + peon (q/a 91)

EQUIPMENT : One tranquiliser set, and one jeep, which are at present on loan to Dhrangadhra Sanctuary. Only one jeep for patrolling + protection (q/a 91)

New Status?

RESEARCH AND MONITORING : None

COMMUNITY INTERACTION PROGRAMMES : None



Source: ① T-Sheets 416/13, 1st ed. 1968; 416/14, 1st ed. 1970; 416/19, 1968. ② Map sent by the Gujarat Forest Department, Wildlife Wing (undated).

Villages	Nesses	
V ₁ - Mokhana	N ₁ - Ravana	N ₁₁ - Vasawar
V ₂ - Dhebar	N ₂ - Supiya	N ₁₂ - Kasvida
V ₃ - Dhed Khuna	N ₃ - Abhapara	N ₁₃ - Nerjar
V ₄ - Ajmapat	N ₄ - Khunawala	N ₁₄ - Gari
V ₅ - Khakhawall	N ₅ - Bada	N ₁₅ - Wagadiya
V ₆ - Morivirda	N ₆ - Khirar	N ₁₆ - Vi
V ₇ - Sotvirda	N ₇ - Dharaguna	N ₁₇ - Dhediya
V ₈ - Shermalank	N ₈ - Kathiyani	N ₁₈ - Dhyamani
V ₉ - Kharavira	N ₉ - Kileshwar	N ₁₉ - Sijar
	N ₁₀ - Khatiya	N ₂₀ - Khodiyar
		N ₂₁ - Fuljhar
		N ₂₂ - Bhukhsara
		N ₂₃ - Karval
		N ₂₄ - Morivirda
		N ₂₅ - Gandiyawala
		N ₂₆ - Sajjawala
		N ₂₇ - Boriyawala

• Tara Chemwala
T Tanks
New map with nesses (qa 91)
marked.

Are nesses camp. or permanently inhabited ?

Barda Sanctuary

HUMAN PRESENCE

Rights and Leases : The grazier community of Maldharis is allowed habitation and grazing in the sanctuary. An area of 821.26 ha. of gaucher* land inside the sanctuary belongs to various village panchayats. 26.28 ha. is leased out to Tata Chemicals Ltd., Ranavav. Several stone quarries are also located inside [Map], but it is unclear whether these have been allowed or are illegal.

Show location on map?

Habitation : There are 68 villages and nesses inside the sanctuary, inhabited by about 4000 people (1983-84). The surrounding area has 18 villages with a population of about 15,000 (1983-84).*

Grazing : A total of 5,500 cattle graze inside the sanctuary. These belong to the Maldhari families staying inside; permits for grazing are issued to them by the sanctuary staff. In addition to these cattle, about 400 feral camels, and 200 unauthorised goats graze inside.

Offences and Illegal Activities : There are occasional incidents of illicit felling and poaching, but no cases have been filed.

(qa 91) Maldharis do not have grazing rights. Only concessional status now?

Tourism : No records are kept, but tourism is reported to be very light.

Status now?

Use by Other Government Agencies : An area of 358.77 ha., under the Khambhala and Phodara Reservoirs, is controlled by the Public Health Department.

Number of tourists - nil (qa 91)

Miscellaneous : In 1983-84, 57 labourers were employed for afforestation, fence repair, and other works.

New status?

Stray incidents are reported of killing or injuring of livestock by wild animals. No compensation claims on this have yet been made.

INFORMATION FOR VISITORS : November to February is the best time to visit the sanctuary, as vegetation is lush, and climate pleasant. Kileshwar, a Shiva temple, along with several other temples, is located inside [Tp].

Accommodation available consists of one rest house inside the sanctuary, at Satvirda, and another adjacent, at Ghumli.

NGOs/INDIVIDUALS ASSOCIATED : None

↳ One room, two beds (qa 91)

CONTACT ADDRESSES : Conservator of Forests

Wildlife Circle
Sardar Baug
Junagadh - 362 001
Gujarat

(no local address available) →

Asstt Conservator of forest
Barda Sanctuary
Porbandar

* However, the relevant Survey of India toposheet shows dozens of villages in the surrounding area, and far less than 68 villages inside.

?

DHRANGADHRA (WILD ASSES) SANCTUARY

Dhrangadhra Sanctuary, spread over the Little Rann of Kutch, and the adjoining Kutch Desert Sanctuary in the Great Rann of Kutch, form a unique ecosystem, one that is not replicated anywhere else in India. Rann means salt desert, and the sanctuary is a vast expanse of sand and salt, so vast that it leaves one feeling humble and awe-struck. The flat terrain is broken only by a few scattered, low hillocks, called bets. It is these bets which become dry oases when, in the monsoons, the Rann gets completely transformed into a huge, shallow lake by the incoming waters of various rivers on one side and of the Gulf of Kutch on the other. During this periodic flooding the bets were once used by nomadic communities for setting up camp; they are now mostly used by wild animals. They are about the only places inside the sanctuary which have non-saline soils and some forest growth.

Such an ecosystem is bound to have unique wildlife. The single most important reason for the declaration of the Little Rann as a sanctuary is the presence of the rare and endangered Asiatic wild ass (Asinus hemionus khur). This shy animal has recently been forced to move out of the sanctuary in search of food and water, as droughts over the last few years have allowed little regeneration of browse species and recharging of water sources inside the Rann. This, along with disturbance due to activities like salt manufacture, continue to threaten the Wild ass and its habitat.

LEGAL STATUS : Notified a sanctuary on January 12, 1973 vide Notification No. GH/KH/13/WLP/1972/79736-P, under the Gujarat Wild Animals and Wild Birds Protection Act, 1963 [Notif]. Legal steps have not proceeded beyond the collector's proclamation, that too only for Surendranagar District; issued on 24 June 1981. An area of 11,281 ha. was added on January 13, 1978 [Note]. Of the total area, 1,27,153.63 ha. on the Rann periphery still belongs to the Revenue Department.

No. GH/KH/13-78/WLP/1976/89899/P [Notif 2]
AREA AND ZONING : 4,95,370.00 (4953.70 sq. km.) [Note].

There is no zoning.

LOCATION : Districts - Surendranagar, Rajkot, Kutch, Banaskantha, Mehsana

Latitudinal Range : 22° 55' to 24° 35' N

Longitudinal Range : 70° 30' to 71° 45' E 72° E (Centre for Environment Education draft)

Nearest Town : Dhrangadhra (22 km.)

Nearest Railhead : Dhrangadhra (22 km.)

Nearest Airport : Rajkot (140 km.); Ahmedabad (160 km.)

APPROACH : From Ahmedabad to Dhrangadhra (160 km.), then on to sanctuary edge (22 km.).

The sanctuary, spread as it is over 5 districts, can be entered from a number of places. The above approach is perhaps the most convenient as entry permits are given at only Dhrangadhra.

GEOGRAPHY AND CLIMATE : Highest Point : 75 m [Note]

Lowest Point : 3 m [Note]

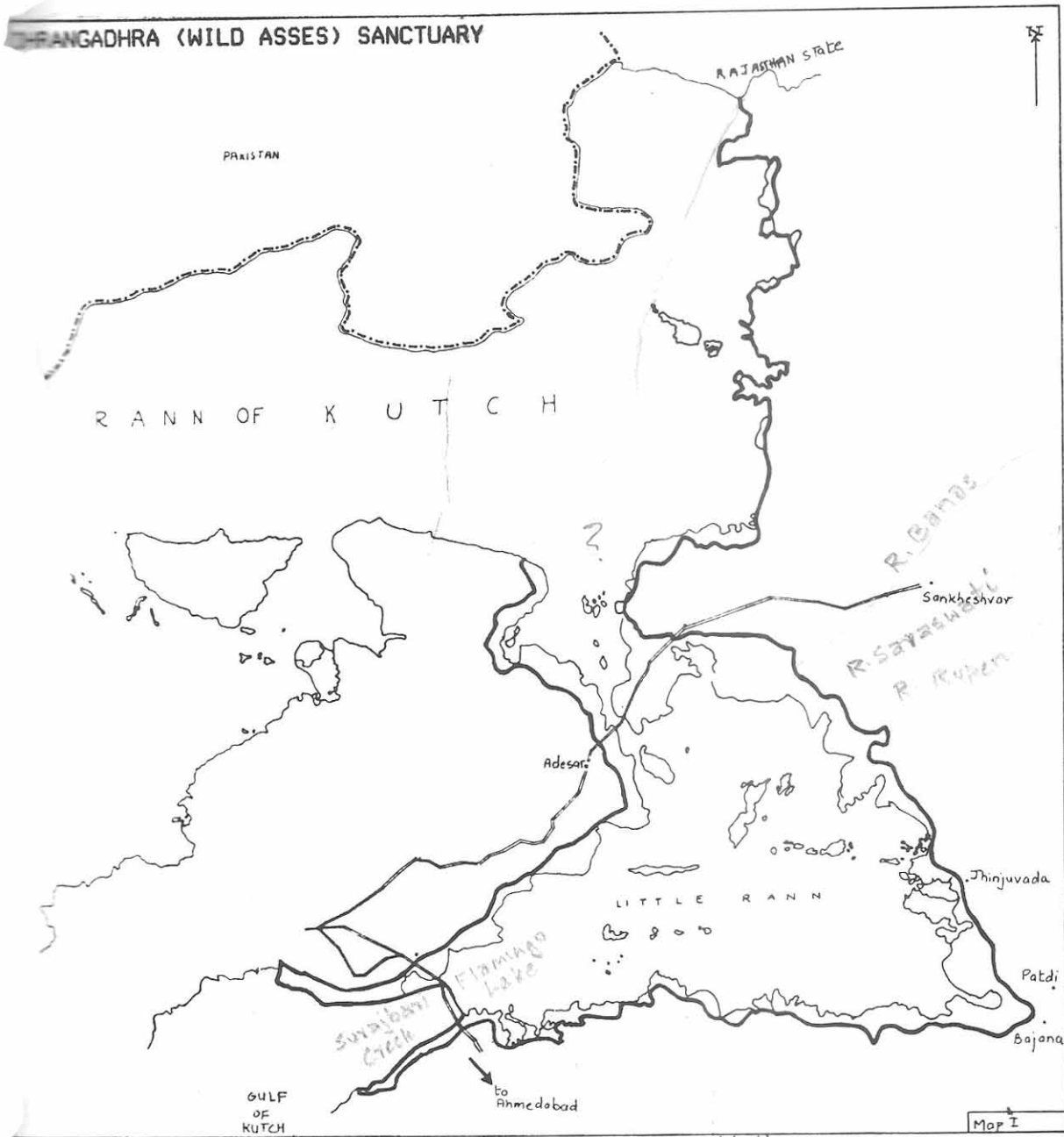
Maximum Temperature : 44.4° C [MP]

Minimum Temperature : 10° C [MP]

Mean Annual Rainfall : 517.8 mm [MP] 350 mm (qa 91)

< 300 mm (Directory of Asian Wetlands)

approx 348 mm (Chimnic table)

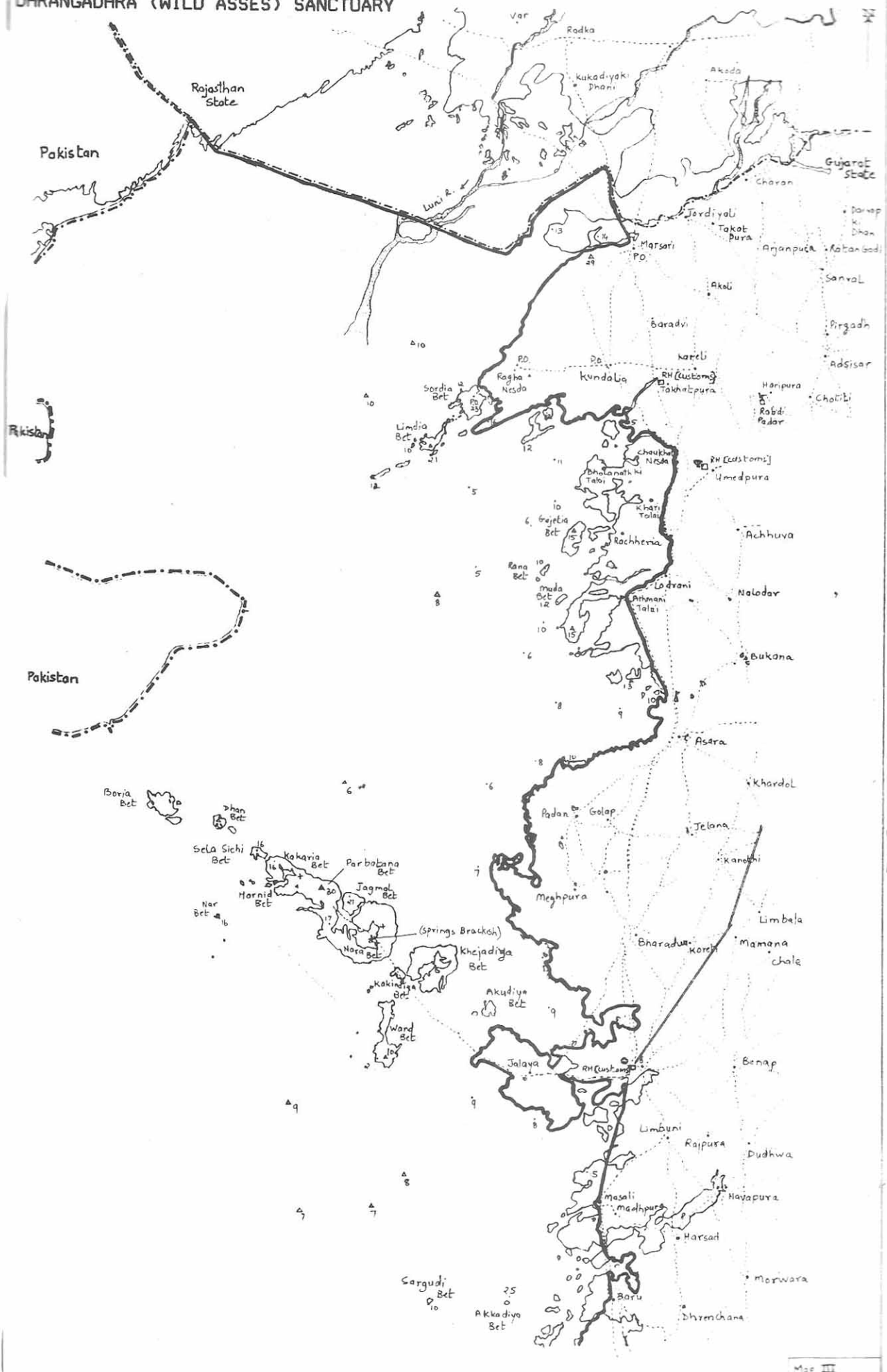


Source: Map sent by the Gujarat Forest Department, Wildlife Wing (undated).

complete the boundary.

Boundary
 — Boundary (9/2/91)

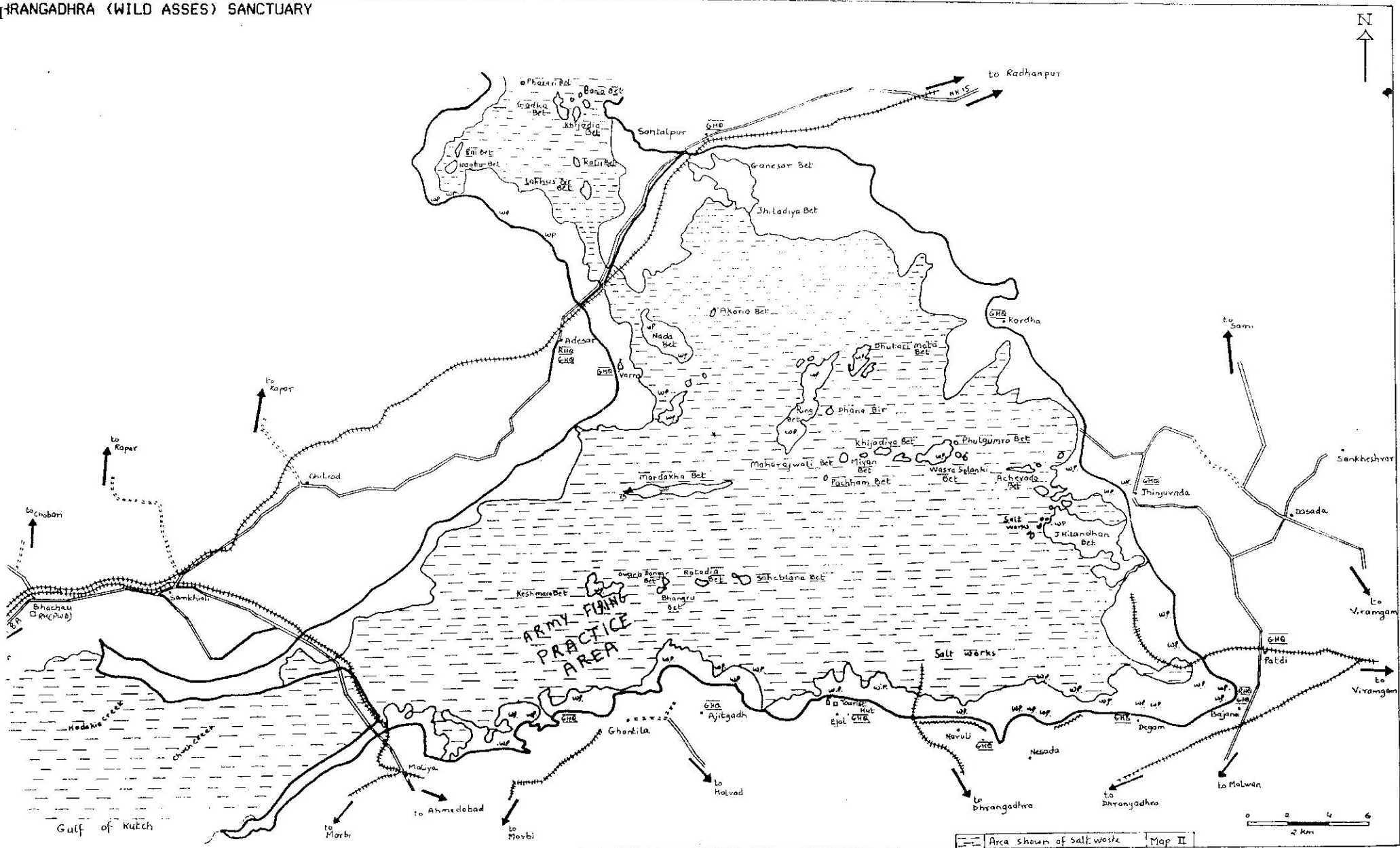
DHRANGADHRA (WILD ASSES) SANCTUARY



Source: ① Topo Sheet - 40P/2 - 1972
 40P/3 - 1972
 40P/4 - 1st ed. 1964
 40P/6 - 1st ed. 1965
 40P/7 - 1970

② Map sent by the Gujarat Forest Department, Wildlife Wing, Junagadh

DHARANGADHRA (WILD ASSES) SANCTUARY



cc: Map sent by the Gujarat Forest Department, Wildlife Wing (undated)

FLORA : The vast expanse of sand, inundated for a part of the year by water, allows little vegetation to come up. It is the islands (bets) in the Rann, and the Rann peripheries, which harbour some forest. The forest types found are SA/C1 Dry Teak-bearing Forest, S/DS1 Dry Deciduous Scrub, and S/DS2 Dry Savannah Forest [MP].

Between 1979-80 and 1983-84, Prosopis juliflora, Leucaena leucocephala, Acacia nilotica, and Acacia tortilis were planted on 3077 ha. for fuelwood. Prosopis juliflora has been spreading rapidly on its own, encroaching into much of the desert habitat, yet also helping to bind soil and providing fuelwood for the local people [FV]. Prosopis cineraria has also been planted, though no further details on this are available. Of the species planted, Prosopis juliflora, P. spicegera, and Leucaena leucocephala are introduced.

FAUNA :

MAMMALS [Q1; MP]

Antelope, Indian (Blackbuck)
Ass, Asiatic Wild
Boar, Indian Wild
Bull, Blue (Nilgai)
Fox, Indian
Fox, Red
Gazelle, Indian (Chinkara)
Hare, Indian
Hyena, Striped
Jackal
Mongoose, Common
Porcupine, Indian
Wolf

BIRDS

Great Indian Bustard
Partridges
Quail
Sandpiper
Great Grey Shrike
Raptors - hawks, falcons, kites
Lesser Flamingo
(qa 91)
Pelicans and waders also.

REPTILES [Q1; MP]

Cobra, Indian
Crocodile, Marsh
Monitor, Common Indian
Python, Indian
Tortoise, Starred

Lizard, Spinytailed (qa 91) → endangered

1989

ENHS did a The Wild ass, and other species, may have become locally threatened
assessment due to the severe drought from 1985 to 1987 [FV]. However, the impact
fauna in of this prolonged drought on the fauna has not been studied, except for
1986 a census done in 1988. — Any latest inform? (qa 91)

An artificial feed of grass, green fodder and corn is spread near water points for the Wild ass to feed on, both to supplement naturally available food as well as to keep the asses from straying out of the sanctuary into adjoining fields. In 1984-85, 11 Wild asses were captured for zoos; no more captures are now proposed.

OCCURRENCE AND CONTROL OF DISEASE : There have been reports of fatal diseases among the Wild ass, in the 1950s and 1960s, and again in 1977, when an unspecified number were affected by 'surra' (a disease caused by the protozoa blood parasite Trypanosoma evansi). There have, however, been no recent reports of disease among this or other species [Q1, MP].

The nearest veterinarian is located at Bajana, 10 km. away.

OTHER FACTORS AFFECTING HABITAT : The single most pervading natural phenomenon of the sanctuary is the age-old periodic flooding in the monsoons, caused by the inflow of Gulf of Kutch waters from the south-west and increased flow of various freshwater rivers that enter from the west and north. This converts the area into a vast lake. The water starts receding as winter approaches, and leaves behind a huge marsh, dotted by bets [FV]. The soil, in much of the sanctuary, is saline because of the salts left behind by the sea-water.

Fires are occasional - between 1979-80 and 1983-84 there were a total of 13 fires. Much of this phenomenon affects either the artificial plantations of the Forest Department, or the natural vegetation on the bets [MP]. The drought years of 1985 to 1987 saw much less fire incidence, as there was very little vegetation to burn. ~~1987~~

Hot winds blow across the whole area from March to June. Drought is quite frequent, with 1984 to 1987 being the worst years in recent times. 1989

New Status? *Querry* There is a proposal to divert the effluents of the Dhrangadhra Chemical Works, located at Dhrangadhra town, to the edge of the sanctuary. If accepted, this could cause water and land pollution problems [FV].

brackish or sweet water? *Pl. show location on map?* *Querry* *Names? Bansa Samanvati Rupen (qn 91)*
WATER RESOURCES : As mentioned above, almost the entire sanctuary area gets transformed into a shallow lake during the monsoons, with only the bets remaining above water. During the rest of the year, water resources present inside include 20 natural lakes, 4 perennial rivers, five springs, and numerous seasonal streams [Q1, MP]. Also constructed, for use especially in times of drought, are 263 small cement troughs, which are filled by tankers brought from outside, and 46 seasonal tanks [Q1, MP]. *location on map?*

Latest? **BUDGET :** Rs. 9,93,000.00 for 1987-88 (Up from Rs. 9,00,000.00 in 1986-87) [Statebudget].

New Plan? **MANAGEMENT PLAN :** A plan prepared for the period 1979-80 to 1983-84 was not submitted for approval. In the absence of such a plan, annual schemes, which are primarily detailed budget statements, form the basis of management.

New Status? *Key* **PERSONNEL :** One Assistant Conservator of Forests, four Range Officers, 10 Foresters, 14 Forest (Sanctuary) Guards, two Orderly Guards, one jeep and one tractor driver, and three office staff members [Statestaff]. The Assistant Conservator of Forests, located at Dhrangadhra, is locally in charge.

New Status *pen* **EQUIPMENT :** Seven rifles, four pairs of binoculars, 10 tents, one slide and one film projector, one microscope, one bicycle, one mini-truck, one tractor, and three motorcycles. One tranquilizer set is on loan from Barda Sanctuary. A jeep is also on loan, but is expected to be replaced soon by one for exclusive use at the sanctuary [FV].

RESEARCH AND MONITORING : Till recently, the only research and monitoring activity being carried out was a census. Counts of the Wild ass have been made since 1946, when Salim Ali of the Bombay Natural History Society conducted a census [MP]; subsequently M.A. Wynter-Blyth made a count in 1956, and E.P. Gee in 1962 [Note]. A census of fauna in general was carried out first in 1976, and repeated in 1983 and 1988 [Note].

Research on the ecology of the Wild ass was started by the Wildlife Institute of India, in 1988.

COMMUNITY INTERACTION PROGRAMMES : None

HUMAN PRESENCE :

Rights and Leases : Villagers on Nada Bet are allowed habitation, cultivation, fuelwood collection and other such activities on the Bet, but it is not clear if these are rights or concessions. Villagers within and around the sanctuary have the right to religious yatra over a few kilometres, to the Wasra Solanki Bet. In addition, a 3 km. road from Adesar to Nada Bet, passing through the sanctuary, is controlled by the village panchayat. Salt manufacturers have been leased 27,498.80 ha. of land inside the sanctuary. *Show location on map. map given*

Habitation : One village, with a population of about 800 people, is situated on Nada Bet, inside the sanctuary. In the surrounding areas there are 84 villages inhabited by 62,628 people (1981 census) *Do you have 1991 figure*

Grazing : Over 5000 cattle, 2500 sheep, and 2000 goats graze illegally within the sanctuary, in the scrub area bordering the Rann. They belong to people living in villages adjacent to the sanctuary.

Offences and Illegal Activities : Apart from grazing, illicit lopping, for firewood and for charcoal-making, takes place both on the Rann periphery and on the bets [FV]. Villagers from adjacent areas as well as salt workers are, allegedly, involved in this. Poaching, especially of Indian gazelle and Blue bull, is also reported [Salt].

Between 1979-80 and 1983-84, 10 cases of illegal hunting, 13 of causing fire hazard, and 338 of illegal grazing, were filed. *New Status*

Tourism : No record is kept of the number of tourists visiting the area, but there is, reportedly, very little tourism.

Use by Other Government Agencies : A stretch (approx. 12 km.) of NH15, and another stretch (approx. 5 km.) of NH8a, pass through the sanctuary, and are controlled by the PWD. The Gujarat Electricity Board maintains about 3 km. of transmission lines inside. The Indian Army too has a presence, in the form of a firing range over several thousand hectares (exact area not known) within the sanctuary. There is a portion of the Ahmedabad-Kandla rail track (approx. 5 km.), and another stretch of the Palanpur-Kandla rail line (approx. 12 km.), which pass through the sanctuary [MP]. One police outpost exists on Sordia Bet [Map]. Finally, the peripheries of the Rann are used by the Forest Department (Territorial Wing) for forest plantations [FV]. *show their extent on the map?*

Miscellaneous : In 1986-87, a total of 736 labourers were employed for digging ponds and trenches, and for pruning operations. *New Status*

Crop damage in surrounding areas, by Wild asses and other animals, has been very common [FV]. This is especially so in drought years. During the severe drought of 1985-1987, the asses stayed outside the sanctuary almost through the year, causing substantial crop damage [FV]. Compensation for such damage is not paid.

INFORMATION FOR VISITORS : January to June are the best months for visiting the sanctuary, as it is easily approachable, and traveling

inside it is convenient. The area remains closed from July to October, as it gets cut off by floods [MP]. There are 3 temples inside, at Vanu, Jognima, and Mota Wasadada. *show on map?*

Vehicles have to pass through checkposts manned by Territorial Wing Staff, on the Maliya-Bhachau highway (NH 8a) which cuts through the sanctuary [FV]. Entry by vehicles is possible from several other points, but permission is required from the Sanctuary Superintendent, Dhrangadhra.

Accommodation is available at a PWD guest house at Dhrangadhra (previous permission needed), and at rest houses at Randhanpur, Halwad, Tharad, Bazava, Bhachau, and Rapar, all outside the sanctuary.

Also proposed to be constructed are a government (?) guest house at Dhrangadhra and a FRH at Bajana.

A map of the sanctuary is available for reference. Occasional slide shows are organised for visitors. Official vehicles are available to visitors, on payment of specified charges.

NGOs/INDIVIDUALS CONNECTED : None

CONTACT ADDRESSES :

ACF/Sanctuary Superintendent
Dhrangadhra (Wild Asses) Sanctuary
Dhrangadhra
Dist. Surendranagar - 363 310
Gujarat

Conservator of Forests
Wildlife Circle
Sardar Baug
Junagadh - 362 001
Gujarat

*Is this
pin code
of Dhrangadhra?
or Dist. also have
pin codes in
Gujarat?*

HINGOLGADH SANCTUARY

This tiny sanctuary is perhaps the only one in India to be created specially for educational purposes, and also the only one managed almost entirely by a non-governmental body, the Gujarat Ecological Education and Research (GEER) Foundation. The sanctuary is frequently used for holding nature education camps. An imposing palace and fort, belonging to the former ruler, the Darbar Sahib of Jasdan, overlook the thorn forests of the area.

LEGAL STATUS : Notified a sanctuary on August 29, 1980. All legal procedures have been completed.

AREA AND ZONING : 654.07 ha. (6.54 sq.km). There is no zoning.

LOCATION : District : Rajkot

Latitudinal Range : Approx. $22^{\circ} 08' 15''$ to $22^{\circ} 09' 32''$ N [Tp]

Longitudinal Range : Approx. $71^{\circ} 18' 38''$ to $71^{\circ} 20' 17''$ E [Tp]

Nearest Town : Vichhia (7.5 km) [Tp]

Nearest Railhead : Jasdan (19 km.)

Nearest Airport : Rajkot (100 km.)

APPROACHES : From Ahmedabad to Botad (?? km.), then to Vichhia (?? km.), and on to sanctuary (7.5 km.)

From Bombay to Rajkot by air, then to Jasdan (Approx. 50 km.), and on to sanctuary (19 km.)

TOPOGRAPHY AND CLIMATE :

Highest Point : 322 m [Tp]

Lowest Point : 179 m [Tp]

Maximum Temperature : 42 °C

Minimum Temperature : 7 °C

Mean Annual Rainfall : 500 mm (17.5 mm (Naik et al, 90)

FLORA : The entire sanctuary area consists of Northern Tropical Thorn Forest 68.

In 1980-81, 54 ha. / were planted with Acacia nilotica, Acacia senegal, and Prosopis juliflora, to meet fuelwood requirements of villagers living in adjacent areas. Since then, however, all such forestry operations have been stopped.

Prosopis juliflora and Acacia senegal are introduced species.

FAUNA :

MAMMALS

Bull, Blue (Nilgai)

Gazelle, Indian (Chinkara)

Jackal

Wolf

REPTILES

Cobra, Indian
Gecko, Fat-tailed
Krait, Common Indian
Monitor, Common Indian
Snake, Common Rat
Snake, Common Wolf
Viper, Sawscaled

OCCURRENCE AND CONTROL OF DISEASE : No disease has been reported among flora and fauna. The nearest veterinarian is located at Jasdan, 19 km. away.

OTHER FACTORS AFFECTING HABITAT : Recurrent water shortage is experienced during summer, to counter which one watering point has been established and two bore wells are proposed. Another factor affecting the habitat is hot winds, which blow across the entire area in May-June. Forest fires are rare, the last incident being in 1981-82, when about 20 ha. was affected.

In November, 1982, a severe cyclone struck the sanctuary, uprooting hundreds of trees.

WATER RESOURCES : Two seasonal tanks (artificial), one seasonal lake (natural), one perennial waterhole (artificial), and several seasonal streams [Q1, Tp].

BUDGET : No separate allocation. Funds come from the Forest Department budget (Rajkot Div.??).

MANAGEMENT PLAN : None

PERSONNEL : One Range Officer, one Forester, one Forest Guard, and two watchmen. The Range Officer is the local in-charge, located at Amrapar.

EQUIPMENT : None

RESEARCH AND MONITORING : None

COMMUNITY INTERACTION PROGRAMMES : None

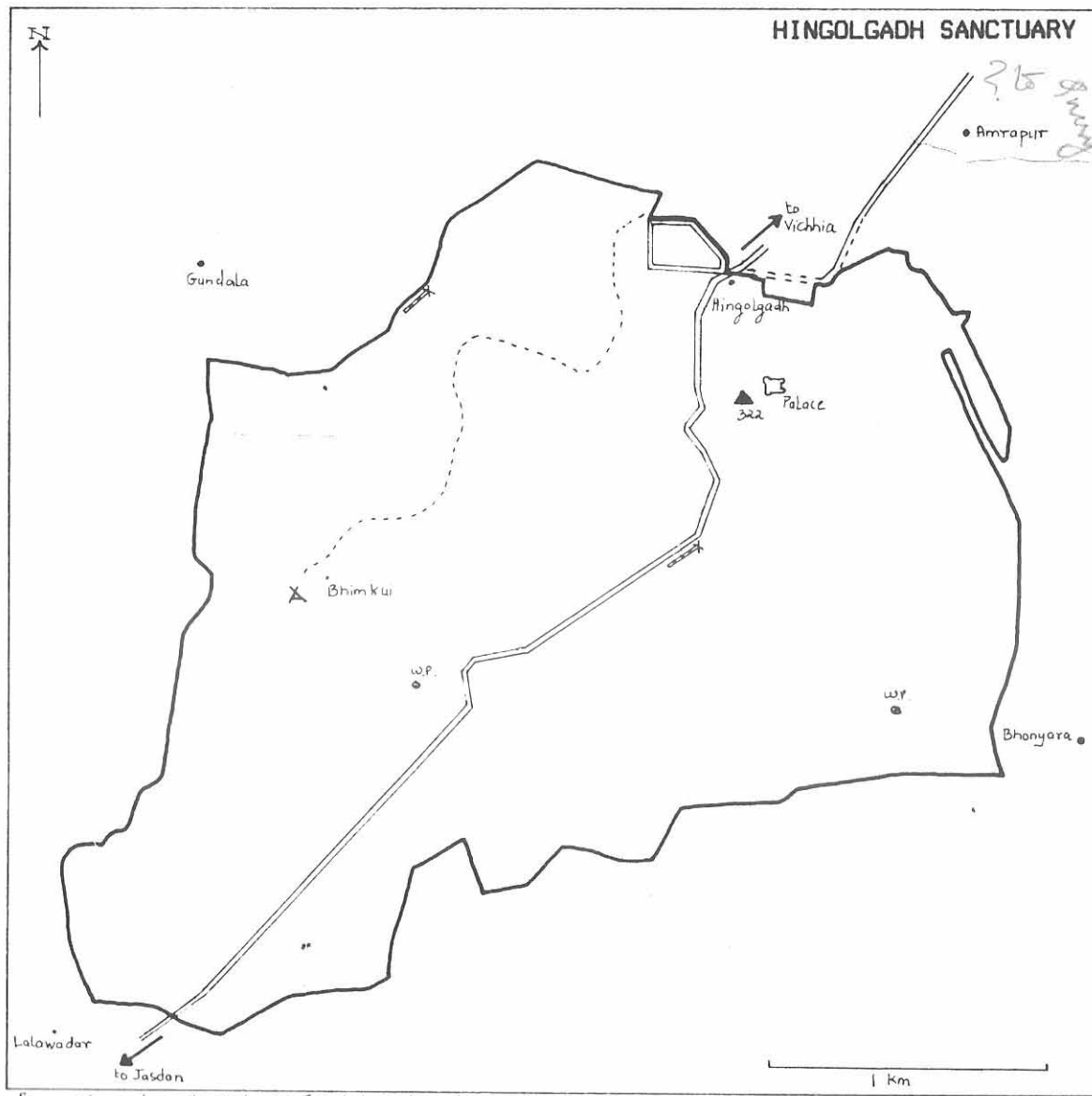
HUMAN PRESENCE :

Rights and Leases : The Darbar Sahib of Jasdan has habitation rights on 40 ha. inside the sanctuary. This includes the palace and the area around it.

Habitation : While there are no human settlements inside, the surrounding area has 28 villages with a population of 40,836.

Grazing : Some illegal grazing, the extent of which has not been estimated, occurs inside. There is a proposal to allow fodder collection to reduce this.

Offences and Illegal Activities : Between 1979-80 and 1983-84, as many as 100 cases of illegal grazing and entry of cattle were filed, all of them involving villagers.



Source: Map sent by the Gujarat Forest Department, Wildlife Wing, (undated)
 (b) Topo sheet no 41N/8 - 1st ed, 1969.

Tourism : Complete records are not kept. The bulk of the tourists are students, for whom nature education camps are held regularly. An estimate of the students coming in August-September puts the figure at about 1,500. *What info?*

Use by Other Government Agencies : The roads within the sanctuary (length not available), including a thoroughfare, are controlled by the State Road and Building Department. About 80 to 100 vehicles, and 7000 people on foot, pass through the sanctuary annually on the thoroughfare.

Miscellaneous : In 1983-84, 645 labourers were employed by the Forest Department, for maintenance of plantations. *What?*

INFORMATION FOR VISITORS : September to January is the best period for visiting the sanctuary as the weather is pleasant and the area is lush green. There is a historic fort and palace of the former Darbar Sahib of Jasdan, his private property, and a Shri Ramji temple near it.

A Government Guest House at Jasdan, outside the sanctuary, offers accommodation.

NGOs/INDIVIDUALS ASSOCIATED : The Gujarat Ecological Education and Research (GEER) Foundation has managed the sanctuary since 1984. In addition, a number of other groups/individuals are associated with the sanctuary, primarily with the educational activities. The Hingolghat Nature Education Programme of the Ala Khacher Trust, Jasdan, conducts nature education camps in collaboration with the World Wide Fund for Nature-India (WWF-I) and the Forest Department. Shri Lavkumar Khacher of WWF-I and the Darbar Sahib of Jasdan are Honorary Wildlife Wardens of the sanctuary. *What info?*

CONTACT ADDRESSES :

Range Officer
At : Hingolghat
P.O. Amrapur
Dist. Rajkot - 360 055
Gujarat

GEER Foundation
G8 - 11, Sector 9
Gandhinagar - 382 009
Gujarat

*P.O. Amrapur
Hingolghat - (pin?)
Dist. Rajkot.
Gujarat.*

JESSORE SANCTUARY

Located on the north-western fringe of the Aravalli mountain range, Jessore is one of Gujarat's three Sloth bear sanctuaries. The habitat is mostly hilly with dry deciduous vegetation. Its area once formed a part of the erstwhile Palanpur State, and is reported to have been well-protected then. Today, there is a considerable amount of human disturbance, including large-scale mining inside the sanctuary. In addition, drought is reported to have had a destructive effect on the habitat in the last few years. No mining within the sanctuary (q a 91) show on map?

The sanctuary borders Rajasthan state, to the north.

LEGAL STATUS : Notified a sanctuary on May 6, 1978 vide Notification No. GHKH/65/78/WLP/2077/62041/P. Enquiry by the District Collector into rights existing in the area was completed in 1984. An unspecified extent of revenue land is still under control of the Revenue Department.

AREA AND ZONING: 18,066.27 ha. (180.66 sq. km.). There is no zoning.

LOCATION : District : Banaskantha

Latitudinal Range : 24 19 57' to 24 31 08' N [Tp]

Longitudinal Range : 72 22 32' to 72 37 11' E [Tp]

Nearest Town : Palanpur (28 km./25 in Note ???) ?

Nearest Railhead : Iqbalgarh (3 km.)

Nearest Airport : Ahmedabad (166 km.)

APPROACHES : Ahmedabad to Palanpur (144 km.) on to Iqbalgarh (28 km. ??), then to sanctuary (3 km.). (5 kms) (q a 91) (29 (acch Indian Distance guide) 25 km (q a 91))

Jaipur to Abu (??), on to Iqbalgarh (30 km.), then to sanctuary (3 km.).

TOPOGRAPHY AND CLIMATE :

Highest Point : 1090 m [Tp]

Lowest Point : 167 m

Maximum Temperature : 43 C

Minimum Temperature : 9 C

Mean Annual Rainfall : 450 mm

FLORA : The sanctuary consists of Northern Tropical Thorn Forests, 6B.

Details of plantations undertaken in the sanctuary are as follows:
1979-80 to 1983-84 - 554.73 ha. planted with Acacia catechu, Albizia lebbek, Prosopis juliflora, Eucalyptus spp., Parkinsonia aculeata, Tamarindus indica, Pithecellobium dulce, Acacia tortilis, Acacia nilotica, Dalbergia sissoo, and Dendrocalamus strictus, for fuelwood purposes.

From 1984-85 to 1987-88, 513 ha. planted with Acacia tortilis [Plant].

Acacia tortilis, Eucalyptus spp., Prosopis juliflora, and Dalbergia sissoo are introduced species.

FAUNA :

Mammals [Q1; FV]

Bear, Sloth
Boar, Indian Wild
Bull, Blue (Nilgai)
Fox, Indian
Hare, Indian
Hyena, Striped
Jackal
Langur, Common
Leopard
Mongoose, Common
Pangolin, Indian
Porcupine, Indian

Reptiles [Q1; FV]

Cobra, Indian
Krait, Common Indian
Monitor, Common Indian/Desert ?
Python, Indian
Snake, Common Rat
Viper, Russell's

Q. 1 Salt-licks (number not known) are provided for wildlife, as there is believed to be a scarcity of natural salt. *Is it still done?*

OCCURRENCE AND CONTROL OF DISEASE : There has been no report of disease among plants or animals. The nearest veterinarian is located at Amirgadh, 10 km. away. *Which direction, please show on map?*

OTHER FACTORS AFFECTING HABITAT : In 1980-81, an accidental fire affected 10 ha. The sanctuary authorities have cut about 60 km. of fire lines as a counter-measure to fire. More serious, however, is the occurrence of drought. Repeated droughts from 1984 to 1988 are reported to have caused 50% mortality among trees. Also common are hot winds, which blow throughout the area, from April to June. *on map?*

WATER RESOURCES : The Sipu and Banas Rivers flow along the northern and southern boundaries of the sanctuary, respectively. The Dantiwada Reservoir adjoins in the South-west [Map]. There are 10 seasonal streams, and 20 (seasonal) natural waterholes, in the sanctuary. In addition, three seasonal tanks and 22 seasonal checkdams have been constructed. *show on map?*

BUDGET : Rs.1,51,000.00 for 1987-88 (down from Rs.1,75,000.00 for 1986-87) [Statebudget]. In addition, under the "Scheme for Jessore Ratanmahals and Dumkhal Sloth Bear Sanctuary" Jessore has been allotted Rs. 2.01 lakhs for 1987-88, and Rs. 2.47 lakhs for 1986-87 [Budg]. *latest?*

1988-89 = Rs.1,60,685/- 1989-90 = Rs.3,59,980/- (qa 91)
MANAGEMENT PLAN : None. Management is based on annual schemes. *New Statute?*

*** PERSONNEL :** One Range Officer, one Forester, *4 (qa 91)* three Forest Guards (Wildlife Watchers), one Orderly Guard, two Checkpoint Guards, one jeep driver, and two Armed Police Constables, are posted in the sanctuary [Statestaff]. *latest?*

The RO is the local in-charge, stationed at Iqbalgarh.

EQUIPMENT : Two rifles and one jeep are available in the sanctuary - *latest?* [FV].

One (12 bore) rifle and one jeep (qa 91)

*** RFO - 1** } State staff
Forester - 1 }
Orderly guard 1 } 14-8-92 . 39
Armed police constable 1 }

RESEARCH AND MONITORING : None. A wildlife distribution map is available for reference [FV].

COMMUNITY INTERACTION PROGRAMMES : None. Nature education camps are proposed to be started.

HUMAN PRESENCE:

Rights and Leases : Local villagers have rights to or concessions of grazing, and for collection of timber, fuelwood, and minor forest produce. Permits for quarrying and removal of stones and earth are given, for some of the area, by the DFO (Territorial), Palanpur (Right). The Ashapuri Mining Works has been leased 754.72 ha.; it now operates under a High Court stay order, since the Forest Department has attempted to evict it. Several temples are maintained, inside, under rights concerning religious monuments, and pilgrims have a right to visit (religious yatra) to the temple at Kedarnath and an old well (a well with steps) next to it. 151.75 ha. is on a private lease for Ziziphus orchards; this is also being operated on a High Court stay, as the Forest Department has tried to terminate its lease.

Habitation : There are 18 villages inside the sanctuary, with a population of 13,117 (1981 census) [Popn-In]. The surrounding area, within Gujarat, has 70 villages inhabited by 73,484 people (1981 census) [Popn-Out]; the figures, of population in the surrounding areas, of Rajasthan, are not available. — Is it available now?

Grazing : In 1982 (no later estimates are available), a total of 47,861 heads of livestock (9,815 cows, 12,087 buffaloes, 9,744 sheep, 15,685 goats, 404 camels, and 126 donkeys) from villages inside the sanctuary, and another 43,121 heads (13,380 cattle, 15,483 sheep and 14,258 goats) from adjacent villages, grazed inside. In addition, livestock from Rajasthan was reported to be coming in, but no figures on this are available.

Offences and Illegal Activities : Between 1984-85 and 1987-88, 22 cases of habitat destruction, and 8 cases of illegal grazing (compared to 192 such cases between 1979-80 and 1983-84), were recorded. There are reports of illegal fodder removal, though no cases have been filed.

Tourism : No record of visitors to the sanctuary is kept.

Use by Other Government Agencies : 33 km. of roads are controlled by the PWD; the thoroughfare inside carries about 7,500 people annually. Three tanks have been constructed inside, for irrigation [FV]. But they have never been used for this purpose, and it is unclear who controls the 114.01 ha. they cover.

Miscellaneous : Work on fences, checkdams and other developmental activities required the employment of 120 labourers inside the sanctuary in 1983-84. Between 1986-87 and 1987-88, a total of 27,318 person-days were generated by fodder plantation and other works [Labour].

In 1986-87, there were two attacks on humans by Sloth bears, one inside and one outside the sanctuary [FV]. Neither attack was fatal.

INFORMATION FOR VISITORS : The best period for visiting the sanctuary is between November and February, when the weather is pleasant and the area is green. The Kedarnath Temple, inside the sanctuary, is the focus of pilgrims, especially on Shivratri when, festivities are organised on its precincts.

any annual fair held here? which month?

Accommodation is available at a PWD rest house and at the Gujarat Agricultural University, both at Dantiwada, about 15 km. away. There are also several hotels, and a PWD resthouse at Palanpur, 30 km. away.

Maps and a checklist of animals are available for reference at the sanctuary. Guided tours, in a closed van, are proposed to be started.

NGOs/INDIVIDUALS CONNECTED : None

CONTACT ADDRESS(ES) : Deputy Conservator of Forests
Banaskantha Division
Palanpur ← ? →
Dist. Banaskantha - 385 001
Gujarat

Address of local in charge :

→ 1989-90 → 36 cases of tree-cutting, 13 of grazing, 19 of fire and 20 miscellaneous. A maximum of Rs 2000/- was recovered towards compensation. (q. 91)

KHIJADIYA SANCTUARY

Lying on the coast of Kutch, this small bird sanctuary was created out of revenue wasteland when, some 5-6 decades back, a bund was erected to restrict freshwater outflow and saltwater inflow. The lake thus created has attracted a fair diversity of waterbirds. Unfortunately over the years, siltation is reported to have reduced its depth, considerably diminishing its water-holding capacity and rendering it completely dry in drought years.

The sanctuary is adjoined almost immediately to the north by the Marine Sanctuary, with the bund and some mud flats falling in-between.

LEGAL STATUS : Notified a sanctuary on May 27, 1981 vide Notification No. AKH-81-81-WLP-1081-102123/P2 [Notif 1]. New area was added on November 6, 1982, vide Notification No. AKH-209/82-WLP/1081/102123-V2 [Notif 2]. Inquiry by the Collector into claims, over the entire area, was started on 1st June 1983, and is reportedly still under way.

AREA AND ZONING : 604.86 ha. (6.05 sq.km.). (182.90 ha. were notified on 27th May 1981, then another 421.96 ha. on 6th November, 1982).

There is no zoning.

LOCATION : District : Jamnagar

Latitudinal Range : Approx. 22° 30' to 22° 34' N

Longitudinal Range : Approx. 70° 06' to 70° 12' E

Nearest Town : Jamnagar (10 km.)

Nearest Railhead : Hapa (10 km.)

Nearest Airport : Jamnagar (10 km.)

APPROACHES : From Ahmedabad to Jamnagar (308 km.), then on to the sanctuary (10 km.)

TOPOGRAPHY AND CLIMATE :

Highest Point : 19 m [Tp]

Lowest Point : 0 m [FV]

Maximum Temperature : 42° C

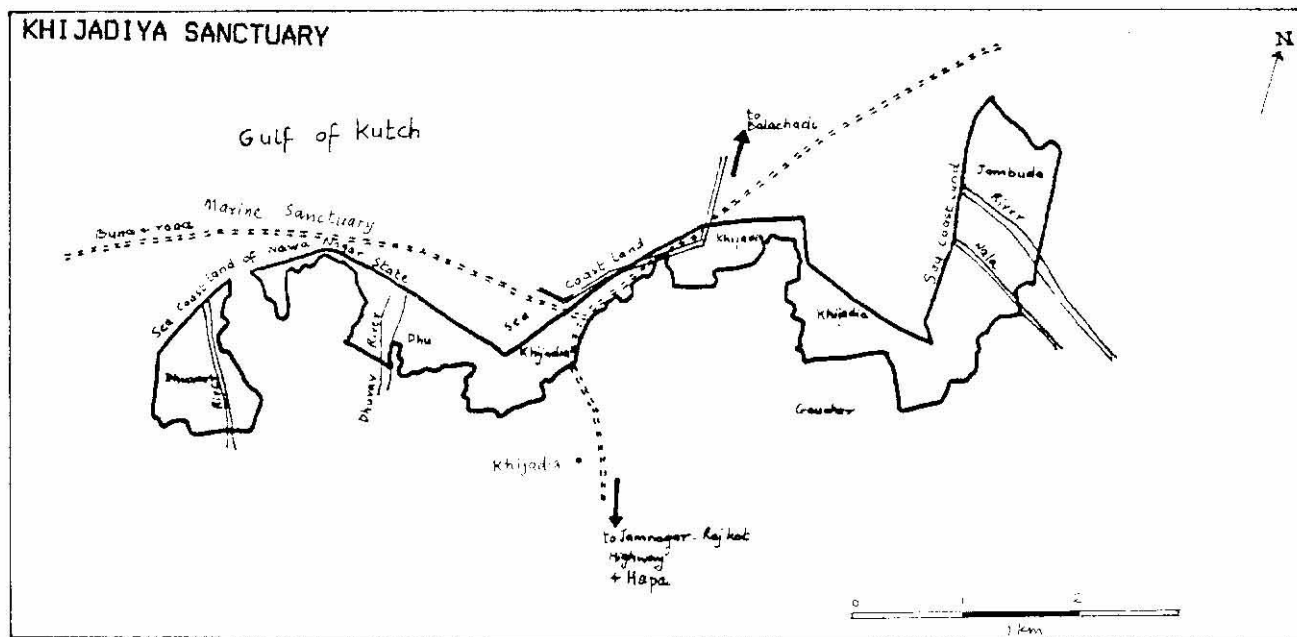
Minimum Temperature : 2° C

Mean Annual Rainfall : 854 mm

FLORA : The area is almost entirely a wetland, with some tree and other vegetative growth along the lake sides [FV].

In 1983-84, 0.2 ha. were planted with Acacia nilotica and Thespesia populnea along the lake periphery, and on the islands artificially created inside the lake. This was aimed at providing nesting space for birds; however, the plantations were largely unsuccessful.

Prosopis juliflora, possibly an accidental introduction, was seen sprouting on the lake bed in the drought years of 1985-87 [FV]. Acacia nilotica and Thespesia populnea are also introduced species.



Source: Map sent by the Gujarat Forest Department, Wildlife Wing (undated)

FAUNA : The area is essentially a waterbird habitat [FV]. No information exists on the fish and other fauna that may inhabit the lake and its surrounds.

The three continuous droughts between 1985 and 1987, may have threatened some species, but the impact on fauna has not yet been studied.

OCCURRENCE AND CONTROL OF DISEASE : No occurrence of disease has been reported so far. The nearest veterinarian is located at Jamnagar, 10 km. away.

OTHER FACTORS AFFECTING HABITAT : Drought has periodically affected the sanctuary since 1979. In the severe drought years of 1985-87, the lake remained dry almost throughout the year. Whatever little water accumulated, was drawn out by villagers for irrigation [FV]. Hot winds blow in April-May, and occasional gales and cyclones occur in August. The entire sanctuary is affected by these phenomena. Some amount of pollution is caused by the release of 'bittern' (highly saline effluents) from the adjacent salt works into the lake [FV]. The impact of this is not known; though it could contribute to salination.

Silting of the lake is reported to have reduced its depth considerably in the last few years [FV].

WATER RESOURCES : Part of the area is an artificial seasonal lake, with six seasonal streams flowing into it.

BUDGET : Rs. 1,59,000.00 for 1987-88 (up from Rs. 1,00,000.00 in 1986-87) [Statebudget].

MANAGEMENT PLAN : None. New status?

PERSONNEL : One Forester, two Orderly Guards, one mali, and one boatman [Statestaff]. The CF Jamnagar is overall in-charge, the forester locally so [FV].

EQUIPMENT : One fibreglass boat is available at the sanctuary. One van and nine pairs of binoculars are shared with the adjoining Marine National Park and Sanctuary.

RESEARCH AND MONITORING : Research on the Reef heron was conducted in 1983-84, by Parasharia of Saurashtra University. A study of birds of the sanctuary, and of the adjacent salt works, are being carried out by Taej Mundkur, also of the Saurashtra University [FV].

COMMUNITY INTERACTION PROGRAMMES : Educational programmes, with slide shows and lectures, have been carried out several times in one of the adjacent villages. Future plans include camps, lectures, and films in schools of the adjoining villages.

HUMAN PRESENCE :

Rights and Leases : None, except right of way on a small footpath going to Khijadiya village through the sanctuary.

Habitation : While there are no villages inside the sanctuary, the surrounding area has 11 villages with a population of 34,561. Jamnagar pop. is 10 km.

Grazing : Some illegal grazing goes on on the lake peripheries, by livestock numbering about 50-100.

Show on map?

Khijadiya Sanctuary

Survey
Offences and Illegal Activities : Apart from grazing, other illegal activities taking place inside the sanctuary include encroachment (with 6 ha. being encroached upon by the Khijadiya Salt Works) and drawing out of lake water, for irrigation, by villagers. Lopping also takes place but, as in the case of illegal grazing, it is either not detected, or not prosecuted [FV]. Illegal fuelwood collection and fishing in the lake, by labourers of the salt works, is reported [FV].

Tourism : In 1985-86, over 750 persons were estimated to have visited the sanctuary. This includes about 100 to 150 students.

Use by Other Government Agencies : 10 ha. *show this extent on map?* of the sanctuary is used by the Forest Department (Territorial) for irrigation purposes. The Irrigation Department controls the 2 km. of roads on the bund, forming the seaward border of the lake.

INFORMATION FOR VISITORS : November to February are the best months for visiting the sanctuary, especially to see migratory birds [FV].

Accommodation is available at a circuit house, and several guest houses and hotels, at Jamnagar, 10 km. from the sanctuary.

Occasional slide and film shows are held for visitors. Maps, wildlife books, and a photo exhibition are available at Jamnagar (OF's office), for reference.

NGOs/INDIVIDUALS ASSOCIATED : Groups such as World Wide Fund for Nature-India (Saurashtra Branch), and Jamnagar Nature Conservation Society, carry out educational activities about and inside the sanctuary.

CONTACT ADDRESS :

Conservator of Forests, Jamnagar
Ganjiwada
Near Nagnath Police Gate
Jamnagar - 361 001
Gujarat

*Inform. on map and Notif. do not tally?
clarify.*

Considered one of western India's most important wetlands, especially for the waterfowl population in its harbours, Nal Sarovar is also among the first sanctuaries to be declared in Gujarat. It consists of a vast, shallow, seasonal lake, adjoined on three sides by swamp and marsh, and dotted with several small islands. In winter, it is visited by thousands of migrant waterfowl which, along with the resident bird population, make a sight not easily forgotten.

For over a decade after it was declared a sanctuary, Nal Sarovar appeared to be considered more a tourist spot than a wildlife preserve. On a peak day there could be anywhere up to 10,000 visitors, most of them wanting a boat ride on the placid lake. Even though somewhat restricted now, tourism, along with a host of illegal activities, continues to be a major source of disturbance.

LEGAL STATUS : Notified a sanctuary on April 8, 1969 vide notification No. GH-KH-381-WLP-1063-74322-P, under the Gujarat Wild Animals and Wild Birds Protection Act, 1963. Additional area notified under the Wildlife (Protection) Act, 1972 vide Notification No. AKH/238/82/WLP/1082/6121/V-2. While the legal procedures for the original area have been completed, a part (extent not specified) of the additional area which is private land is still to be acquired [FV].

AREA AND ZONING : 12,082.20 ha. (120.82 sq.km.). (The area as initially declared in 1969 was 11500 ha., to which was added 582.20 ha. on December 27, 1982.)

About 800 ha. of the sanctuary has been declared a 'Sanctum Sanctorum', in which no visitors are allowed.

LOCATION : Districts : Ahmedabad, Surendranagar

Latitudinal Range : Approx. 22° 42' to 22° 52' N

Longitudinal Range : 71° 58' 41" [Tp] to approx. 72° 06' E [Q1]

Nearest Town : Virangam (35 km.)

Nearest Railhead : Virangam (35 km.)

Nearest Airport : Ahmedabad (71 km.)

APPROACHES : From Ahmedabad to Sanand (approx. 30 km.) and on to the sanctuary (approx. 40 km.).

TOPOGRAPHY AND CLIMATE :

Highest Point : 20 m [Tp]

✓ Lowest Point : Not available

Maximum Temperature : 44.4 °C

Minimum Temperature : 5 °C

Mean Annual Rainfall : 500 mm

FLORA : The entire sanctuary is a wetland, a shallow lake during and after the rains, a marshy expanse for the rest of the year [FV].

No information exists on threatened species of flora, if any.

Between 1979 and 1981, 3.03 ha. were planted with Peltandra, tererocarpum, Kigelia pinnata, Casuarina equisetifolia, Azadirachta, indica, Delonix regia, Bougainvillea spectabilis, Salvadora persica,

Parkinsonia aculeata, Acacia nilotica, Prosopis juliflora, Cocos nucifera, and Phoenix sylvestris. These plantations were aimed at improving or providing suitable wildlife habitat for nesting and other purposes. Plantations were also carried out in 1984-85, but had to be uprooted after local people pointed out that they were in the same areas used by the people for various activities, including camping with their cattle, during November to February [FV].

same location on map

FAUNA : Waterbirds are the predominant fauna of the sanctuary.

OCCURRENCE AND CONTROL OF DISEASE : No disease has been reported among the sanctuary's animals. The nearest veterinarian is located at Virangan, 35 km. away.

OTHER FACTORS AFFECTING HABITAT : Hot winds blow across the area during April, May, and June. Drought is an occasional problem; in the severe drought years of 1985-87, large parts of the lake remained dry throughout [FV].

WATER RESOURCES : The entire area is a seasonal wetland with three perennial waterholes [Tp]. Bamni River flows into the area from the north-west.

BUDGET : Rs. 8,33,000.00 for 1987-88 (down from Rs. 9,16,000.00 in 1986-87) [Statebudget].

MANAGEMENT PLAN : Under preparation by the State Town Planning Department in consultation with the Department of Tourism and Forests [MP]. Volume 1 of this plan, a broad overview, is ready [MP]. Meanwhile, in the absence of a long-term plan, annual schemes form the basis of management.

PERSONNEL : One Assistant Conservator of Forests, one Range Officer, one Forester, three Sanctuary Foresters, eight Orderly Guards, two gardeners, four boatmen, one boatman-cum-attendant, six watchmen, one bird breeder, one attendant, one curator, four guides, and four office staff members [Statestaff]. The Range Officer, stationed at Vekaria, is locally in-charge.

ACF 1, RFO 1, Forester 1, Orderly guards - 8, Main 2, CCF office 14-8-87
Boatmen 4, Accountant 1, Clerk cum typist - 1, Clerk 1

EQUIPMENT : One rifle, two pairs of binoculars, and an unspecified number of boats.

RESEARCH AND MONITORING : None [but see NGOs/INDIVIDUALS ASSOCIATED, below]. A research centre with laboratory, bird museum, and other facilities is proposed.

COMMUNITY INTERACTION PROGRAMMES : None - status now?

HUMAN PRESENCE:

Rights and Leases : No rights or leases exist within the sanctuary. However, collection of roots and grass by local people is allowed. There exist 2 panchayat - controlled roads (distance not known) in this area, which are thoroughfares.

Habitation : While there is no permanent human habitation inside, graziers do enter during difference times of the year and establish about 10 camps on various islands. The total population of these graziers is about 200. The surrounding area has 15 villages with a population of 29,403 (1983-84).

while the total figures for surrounding areas are not available,

46

latest if possible? immediately adjacent

[9a]

what about wild fauna?

on map?

latest?

A copy, if ready?

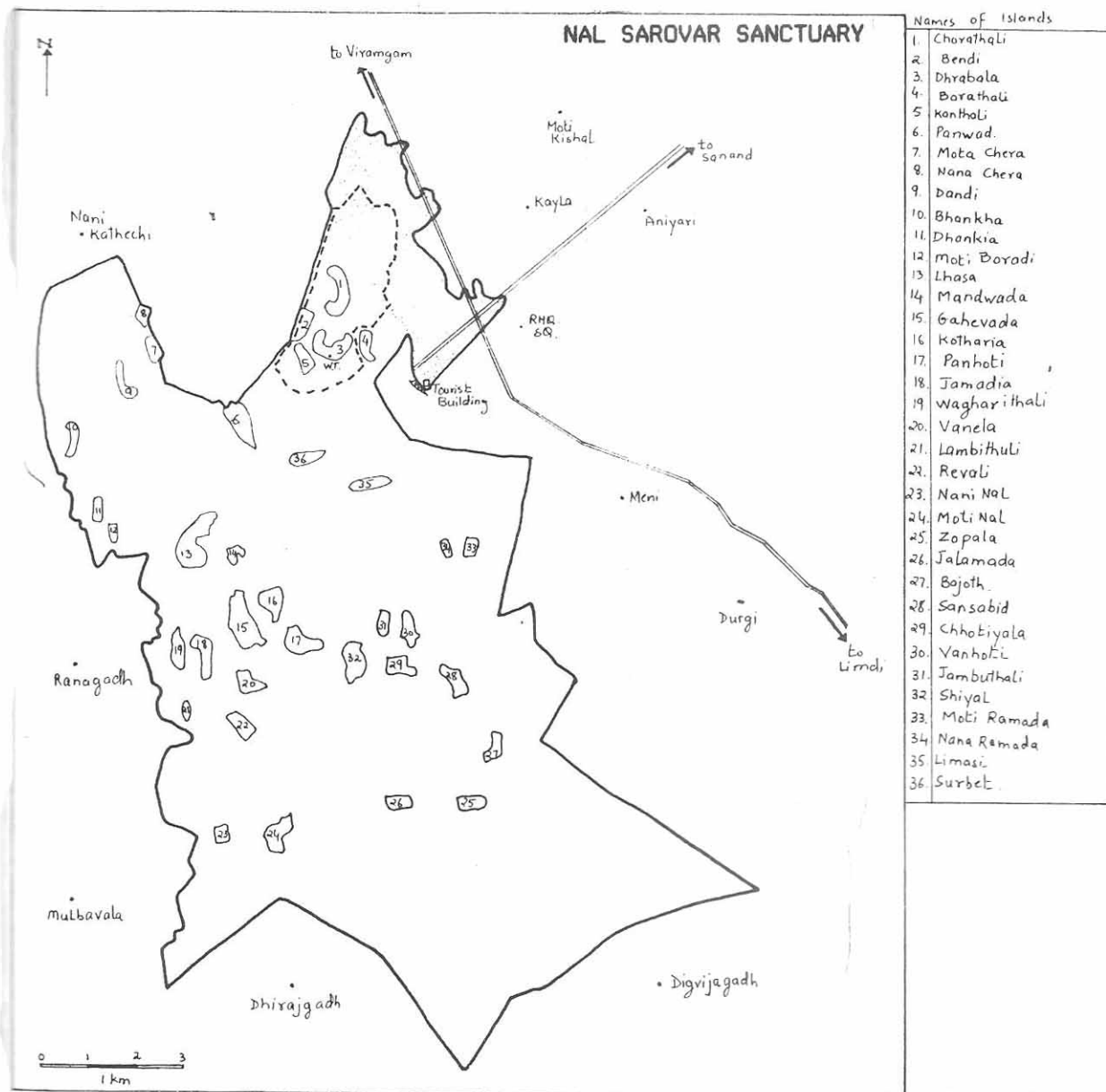
latest?

latest?

Any new information?

show on map?

Tally w/ map with Tp. ?
boundary to tally Notif ?



Source: Map sent by the Gujarat Forest Department, Wildlife Wing (undated).

Grazing : A total of 13,854 cattle, 3,218 sheep, and 1,356 goats from outside, and 87 feral cattle, graze unauthorisedly inside the sanctuary.

Offences and Illegal Activities : Apart from unauthorised grazing, there is illegal fishing, illegal entry, poaching and trapping of birds and illicit fodder removal. Between 1979-80 and 1983-84, the following offences were booked : 64 cases of illegal hunting (most involving villagers), 1 case of habitat destruction (by a government servant) and 11 cases of illegal grazing (all involving villagers). *latest*

✓ Tourism : An estimated ^{2,00,502} ~~1,00,000~~ tourists visited the sanctuary in ~~1983-84~~ ¹⁹⁸⁹⁻⁹⁰. In the peak season, up to 10,000 tourists used to flock to the area in a single day, the vast majority of them using boats to see the sanctuary. The disturbance caused was so great that in 1980 the sanctuary was closed to tourists; while it has been re-opened, the existing tourist complex adjacent to the lake remains closed and a new one much further away is under construction [MP]. *latest Fig*

Miscellaneous : 30 labourers were employed for miscellaneous works, in 1983-84. — *latest if possible?*

There is reported to be crop damage in surrounding areas, by Demoiselle cranes and other birds [FV]. No compensation is paid for such damage.

One instance of a clash between villagers and the sanctuary authorities occurred in 1983, the issue being a dispute over a case of poaching. *latest*

INFORMATION FOR VISITORS : November to February is the best time for visiting the sanctuary, since there is maximum concentration of birds, on the lake.

An attempt was made, in 1985, to introduce a permit system, but was abandoned because of strong opposition from the local villagers [FV]. *For what? entry?*

✓ ACCOMMODATION : ~~none at present~~ ^[9A] *status now, finished?*

A new tourist complex is being constructed. Maps of the area are available for reference, along with books on wildlife, and a checklist of the sanctuary's birds. There are three hides for viewing wildlife. Two Department boats and about 65 private ones are available on hire, for boating on the lake.

* The number of villages surrounding the sanctuary appears to be much larger if the Survey of India toposheet of the area is to be believed. This discrepancy has yet to be resolved. *Show location on map.*

- Information
on when
these were
finished?
- on
what?
- could we
have
copies?

NGOs/INDIVIDUALS ASSOCIATED : The following experts have, at some point in the past, been associated in brief studies on the sanctuary, and have submitted reports based on these :

- Ruben David, Kankaria Zoo, on ~~the~~ management of the sanctuary
- Duleep Matthai, World Wide Fund for Nature - India, "
- Officers of the United States National Parks Service, on visitor orientation & edu. (ga)

No further details are available on the nature of their association.

CONTACT ADDRESSES :

Conservator of Forests
Gandhinagar Circle, Sector 19
Gandhinagar - 382016
Gujarat

Range Officer
Nal Sarovar Sanctuary
At. & P.O. Vekaria — ~~pin?~~ 382110
Tal. Virangam
Dist. Ahmedabad
Gujarat

NARAYAN SAROVAR SANCTUARY

India's westernmost sanctuary, Narayan Sarovar is an important reserve for the Indian gazelle or Chinkara (Gazella gazella). A part of it was the reserve of the former princely state of Kachchh (Kutch). In this sanctuary, scrub and thorn forest are interspersed with numerous water bodies and grassy patches, providing an ideal habitat for Indian gazelle and other herbivores. Unfortunately, there continues to be considerable human and livestock pressure on the sanctuary.

LEGAL STATUS : Notified a sanctuary on April 14, 1981 vide Notification No. AKH-62-81/WLP/1080/110872-) -2 [Notif].

AREA AND ZONING : 30,754.53 ha. (307.55 sq.km.)

The original notification declared an area of 76,579.53 ha. as a sanctuary. But of this, 45,825.00 ha., though formally transferred from the Revenue Department to the Forest Department, have still to be acquired due to private ownership.

There is no zoning.

LOCATION : District : Kutch

Latitudinal Range : 23° 24' 24" to 23° 43' 41" N [Tp]

Longitudinal Range : 68° 29' 59" to 68° 56' 07" E [Tp]

Nearest Town : Matanomadh (5 km)

Nearest Railhead : Bhuj (approx. 100 km.)

Nearest Airport : Bhuj (approx. 100 km.)

APPROACHES : From Ahmedabad to Bhuj (395 km.), on to Nakhtarana (52 km.), then to Matanomadh (43 km.), and finally on to the sanctuary (5 km.)

From Bombay to Bhuj via Jamnagar by air, then as a above.

TOPOGRAPHY AND CLIMATE : Highest Point : 187 m [Tp]

Lowest Point : 3 m

Maximum Temperature : 48 °C

Minimum Temperature : 6 °C

Mean Annual Rainfall : 300 m

FLORA : Forest types found in the sanctuary include Anogeissus pendula Forest 5/DS1, Desert Thorn Forest 6B/C1, Tropical Euphorbia Scrub 6B/DS2, Acacia Senegal Forest 6/E2, and Salvadora Scrub 6/E4.

A plant of special interest for its medicinal properties is Commiphora wightii, collection of which is done only through the Gujarat State Forest Development Corporation.

Between 1981-82 and 1983-84, 500 ha. were planted for fuelwood with Acacia tortilis and Acacia nilotica. For this, 3 nurseries were also set up. In 1983-84, Prosopis juliflora was planted, and it is now spreading throughout the sanctuary leading to a decrease in grassy patches. Acacia tortilis and Prosopis juliflora are both introduced species.

FAUNA :

MAMMALS

Boar, Indian Wild
Bull, Blue (Nilgai)
Caracal
Cat, Desert
Cat, Jungle
Fox, Red
Gazelle, Indian (Chinkara)
Hare, Indian
Hedgehog, Longeared
Hyena, Striped
Jackal
Leopard
Mongoose, Common
Pangolin, Indian
Wolf

The Indian gazelle is reported to be locally threatened due to shortage of fodder and water, grazing pressure, and other human disturbances.

OCCURRENCE AND CONTROL OF DISEASE : Though no disease has been reported among wildlife, as a precautionary measure about 70% of the livestock in villages in and around the sanctuary have been vaccinated. There is a veterinarian located at Dayapar, inside the sanctuary.

by fresh water or sea water?
OTHER FACTORS AFFECTING HABITAT : A number of recurrent natural phenomena affect the sanctuary. Between 1981-82 and 1983-84, about 75% of the area was flooded. Four tanks have been deepened to lessen the impact of flood waters. Ironically, the area is also hit by recurrent droughts. In addition, high velocity winds and storms, hot winds during May-June, and gales and cyclones in June-July, are reported to occur in the sanctuary.

WATER RESOURCES : One perennial lake, three perennial reservoirs, 38 seasonal streams, 99 seasonal waterholes, seven perennial and 40 seasonal artificial tanks, and 8 seasonal streams comprise the water resources of the sanctuary (Tp, Q11).

Latest?
BUDGET : Rs. 3,57,000.00 for 1987-88 (up from Rs. 3,02,000.00 in 1986-87) [Statebudget].

MANAGEMENT PLAN : None. In its absence, yearly schemes form the basis of management.

latest only scheme New plan if there is one?
PERSONNEL : One Assistant Conservator of Forests, one Range Officer, two Foresters, three Orderly Guards, one jeep driver, two armed police constables, and two camel guards [Statestaff].

Latest?
EQUIPMENT : One jeep is available with the Deputy Conservator of Forests, Kutch West Division, for use, when required, at the sanctuary.

Latest?
RESEARCH AND MONITORING : None - New status

COMMUNITY INTERACTION PROGRAMMES : None

Latest. Yearly schemes or new plan, if there is one.

HUMAN USES :

Rights and Leases : Villagers have the right to graze their livestock over almost the entire area of the sanctuary. They also have rights to cultivation over 2471.53 ha; to habitation over 256.52 ha., and to burial grounds over 43 ha. A public thoroughfare passing through the sanctuary is used by over 2.5 lakh people every year. Also, religious yatra is allowed through the sanctuary to the nearby Narayan Sarovar Temple; on the occasion of Dev Diwali, in October or November, 7 to 10 thousand people use this. There are several other small temples inside the sanctuary as well.

Habitation : There are 56 villages inside the sanctuary *, with a human population of about 15,000 (1983-84 figures). In the surrounding area there exist 38 villages, inhabited by about 7,500 people (1983-84 figures).

grazing : There is substantial grazing inside the sanctuary: a total of 20,048 heads of livestock belonging to the villages inside, and 24,900 from surrounding areas. The break-up of this livestock is as follows: 3563 cattle from inside and 20,500 from outside (including 15,000 from Rajasthan), 532 sheep from within and 200 from outside, 13,558 goats from within and 4,000 from outside, and 2,395 feral cattle from inside, with another 200 wandering in occasionally from outside. Some parts of the sanctuary are 'auctioned' as grazing areas; the period when grazing is allowed is October to May.

Offences and Illegal Activities : Poaching is reported to be carried out by military personnel - no further details are available. Between 1981-82 and 1983-84, the following cases were filed : 34 of habitat destruction and 96 of illegal grazing. Most of these involved villagers.

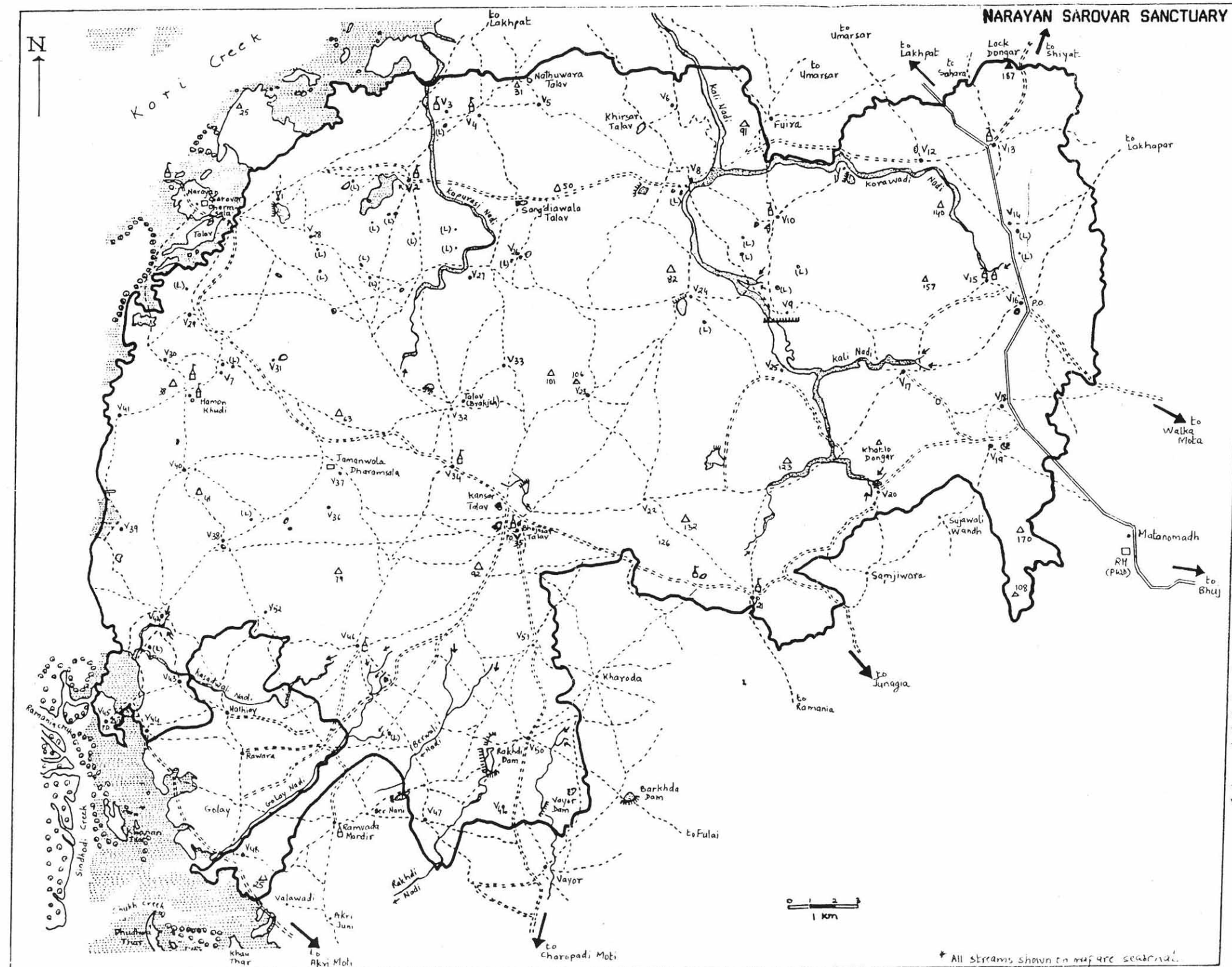
Tourism : No records are kept.

Use by Other Government Agencies : There are four police outposts inside the sanctuary, the area of which is unspecified [Tp]. The PWD controls roads over 292.02 ha. About 700.52 ha. have been submerged under irrigation projects, but it is not clear whose control these reservoirs are under. 1,151 ha. of land have been leased out for lignite mining. In addition, the Gujarat State Forest Development Corporation collects Commiphora wightii for sale outside. Lastly, the Forest Department carries out removal of fodder from within the sanctuary, for sale to the Police and Revenue Departments.

Miscellaneous : In 1983-84, 25 labourers were employed for earthwork, 25 for nurseries, and about 100 for plantations. Any new info m.?

INFORMATION FOR VISITORS : October to February is the best period for visiting the sanctuary, since the climate and visibility are good. Narayan Sarovar Temple, just adjacent, is a famous pilgrimage site.

* Only 52 of these could be located on the relevant toposheets, hence only these 52 are marked on the map.



Narayan Sarovar Sanctuary

Show on map? | Accommodation available inside the sanctuary includes a dharansala at Jamanwala. A PWD rest house at Matanomadh, and a dharansala near Talav offer accommodation in the adjacent areas.

A map of the sanctuary, as well as checklists of birds and other animals, are available for reference.

NGOs/INDIVIDUALS ASSOCIATED : None

CONTACT ADDRESS(ES) :

Sanctuary Superintendent (ADF)
Narayan Sarovar Sanctuary
Kutch West Division
Bhuj - 370001
Gujarat

RATANMAHAL SANCTUARY

One of the three sanctuaries in Gujarat declared especially for giving protection to the Sloth bear (Melursus ursinus), Ratanmahal was formerly the private hunting reserve of the erstwhile Baria State. The habitat is not in prime condition, and human and livestock pressure remains heavy.

LEGAL STATUS : Notified a sanctuary on March 19, 1982 vide Notification No. AKH/53/82/WLP 1081/119648-V2 [Notif].

AREA AND ZONING : 5565.13 ha. An unspecified amount of this area towards the Madhya Pradesh border, presently part of Gujarat, is in dispute as the Madhya Pradesh Government is claiming its jurisdiction over it. [FV].

There is no zoning.

LOCATION : District : Panchmahal

Latitudinal Range : 22° 30' 47" to 22° 35' 13" N [Tp]

Longitudinal Range : 74° 11' 28" to 74° 33' 04" E [Tp]

Nearest Town : Baria (41 km.)

Nearest Railhead : Piplod (54 km.)

Nearest Airport : Vadodara (175 km.)

APPROACHES : Vadodara to Baria (150 km.), then to Kanjeta (41 km.), which adjoins the sanctuary, and on to Pipargota (8 km.) inside the sanctuary, by jeepable track.

TOPOGRAPHY AND CLIMATE : Highest Point : 668 m [Tp]
Lowest Point : 500 m

Maximum Temperature : 44.4 °C

Minimum Temperature : 6.1 °C

Mean Annual Rainfall : 986 mm

FLORA : The sanctuary vegetation consists of Dry Teak Forests SA/C1 (b).

Species of special interest are Asparagus racemosa and Moringa sp., both medicinal plants. Dalbergia latifolia is reported to be threatened due to illicit cutting.

Between 1984-85 and 1988-89, about 125 ha. was planted with Dendrocalamus sp. (Bamboo), Madhuca indica, Ziziphus jujuba, Emblica officinalis (Amla), Syzygium cumini (Jamun), Terminalia bellirica, and Gmelina arborea. Cassia tora, which may have been introduced accidentally, has spread considerably.

FAUNA :

MAMMALS [Q1; FV]

Bear, Sloth
Cat, Jungle
Deer, Barking
Deer, Spotted (Chital)
Hare, Indian
Hyena, Striped
Jackal
Leopard
Mongoose, Common
Porcupine, Indian
Squirrel, Common Giant Flying

REPTILES [Q1; FV]

Cobra, Indian
Monitor, Common Indian
Python, Indian
Snake, Common Rat

Red jungle fowl and Sloth bear are reported to be threatened.

OCCURRENCE AND CONTROL OF DISEASE : Teak skeletonizer and defoliator have been reported on a few trees, but not much damage has yet been done.

There is a veterinarian located at Kanjeta, inside the sanctuary.

cycle period **OTHER FACTORS AFFECTING HABITAT :** Drought is recurrent, the worst recent one being from 1985 to 1988. In these years 36 water points were deepened to retain rainwater longer. Forest fires are common. In 1983, two fires affected 85 ha., while in 1985 a total of 205 ha. was affected.

Firelines measuring 16 km. have been made as a countermeasure.

Hot winds are reported to occur in May.

*None are
to Tp.?* **WATER RESOURCES :** One perennial tank (artificial), 12 perennial and 24 seasonal waterholes (all artificial), one perennial and several seasonal streams, two perennial springs, and 8 perennial wells comprise the water resources of the sanctuary.

latest? **BUDGET :** Rs. 50,000.00 for 1987-88 (down from Rs. 55,000.00 in 1986-87) [Statebudget].

*None are
to Tp.?* **MANAGEMENT PLAN :** None

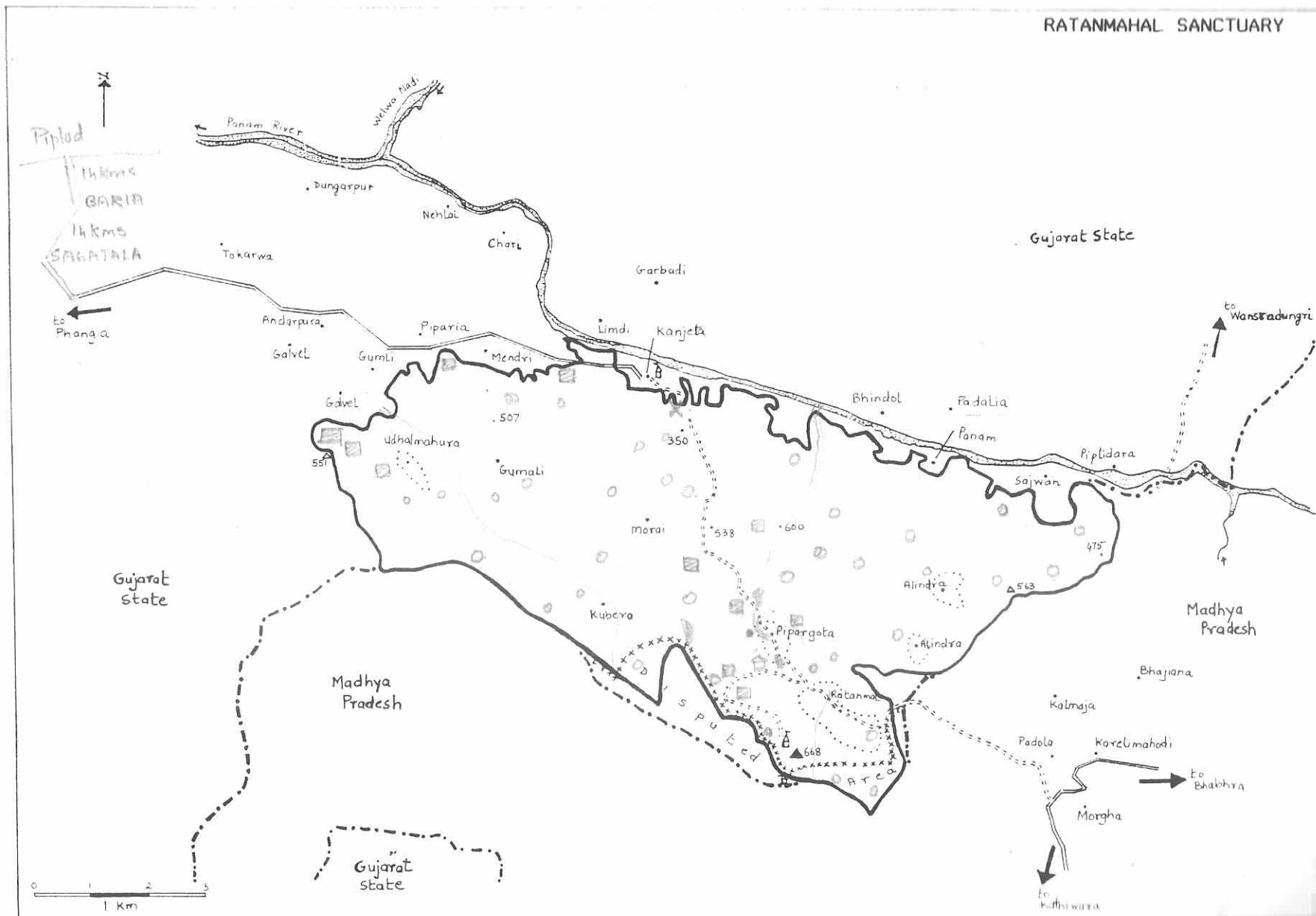
latest? **PERSONNEL :** One Forester and two Forest Guards [Statestaff].

latest? **EQUIPMENT :** Two motorcycles, and one power generator.

latest? **RESEARCH AND MONITORING :** A fauna census is periodically carried out, the last one being in March 1986. — *Latest census report, if any?*

COMMUNITY INTERACTION PROGRAMMES : Some visits to villages are made, with educational material like films, during Wildlife Week. These are not on a regular basis.

RATANMAHAL SANCTUARY



Source: (1) Top sheet 46J/2 - 1st ed. 1969. (2) map sent by the Gujarat Forest Department, Wildlife Wing (undated).

- Fruit tree plantations
- River
- ⬆ Rest-house at Bhuvoro
- X Barrier cum chowki
- Water holes
- ≡ Nalabundings

HUMAN PRESENCE:

Rights and Leases : Rights to grazing and fuelwood collection are enjoyed by the local population. Every May-June there is a fair at the Shiva temple inside, for which visitors are allowed entry and passage inside the sanctuary.

Habitation : There are 11 villages inside* with a population of 6,992 (1987 figures). The surrounding area has 41 villages with 20,350 inhabitants (1981 figures) on the Gujarat side; corresponding figures for the Madhya Pradesh side are not available. *does not tally with the Tp. map the additional vills. in Tp. ?*

Grazing : There are 5,762 heads of livestock, belonging to those with grazing rights inside the sanctuary. *give latest (1991 census) if possible.*

Offences and Illegal Activities : Between 1985 and 1988, 180 cases of illicit felling and grazing and 16 of causing fire, were filed. Over 40 ha. of land inside the sanctuary has been encroached by 55 people. *New status?*

Tourism : No records are kept, but general tourism is reported to be negligible [FV]. The only regular visitors are students, attending nature education camps. These camps involve film and slide shows, lectures, trekking, and other such activities. So far nearly 2000 students have attended since 1982. *New Information?*

Use by Other Government Agencies : 1.50 ha. is occupied by the Irrigation Department for an irrigation tank. The Gujarat State Forest Development Corporation collects minor forest produce from the entire sanctuary. *show on map?*

Miscellaneous : In 1987-88, 5,351 humandays of work were done inside the sanctuary.

Leopards are reported to attack livestock. But very few cases are registered, only two in the period 1977 to 1988. *New information?*

There are also reports of occasional injury to humans caused by Sloth bears.

In 1979, there was a clash between Foresters and cattle thieves from M.P. State who had entered illegally, which led to the death of a Forester.

New Inform. if any?
INFORMATION FOR VISITORS : October to March is the best period for visiting the sanctuary, since the climate is pleasant and roads negotiable. There is an ancient Shiva temple of Ratneshwar Mahadev inside the sanctuary [FV].

Permits must be obtained for entry by vehicle.

Any checkpoints?
* Only 7 villages are shown on the map; however, a part of each of the four villages shown to the north is inside the sanctuary also.

if yes, pl. show on map?

Bhuvro (as in qa 91)

Accommodation is available inside the sanctuary in a Forest Corporation Storehouse at Pipargota. Outside, it is available at a Forest Storehouse and a PWD rest house at Baria.

NGOs/INDIVIDUALS ASSOCIATED : The Nature Lovers Club, Dahod, are involved in nature education and extension work, and in preparing checklist of birds for the sanctuary.

CONTACT ADDRESSES :

Range Officer
Sagtala Range
Sagtala
Taluka : Baria
Dist. Panchmahal
Gujarat

Deputy Conservator of Forests
Baria Forest Division
Baria
Dist. Panchmahal - 389 380
Gujarat

SHOOLPANESHWAR SANCTUARY

Formerly known as Dinkhal Sanctuary, this hilly tract contains some of the best forests left in Gujarat. It forms a part of the catchment of the Narmada River, and is one of the three sanctuaries in the state especially protected for the Sloth bear (Melursus ursinus).

The area of this sanctuary was expanded in 1987, a substantial portion being added to compensate for the forests that are threatened with submergence by the upcoming Sardar Sarovar Project. This portion is expected to absorb some of the wild animals to be displaced by the submergence.

LEGAL STATUS : Notified a sanctuary on September 20, 1982, vide Notification No. GKH-182/82-WLP-1082/8852/BVZ. Area added on February 19, 1987.

AREA AND ZONING : 44,818.70 ha. (448.19 sq.km.)

Area as originally declared was 15,087.21 ha. In 1987 an area of 29,731.49 ha. was added vide notification no. GKH-4-87-AHS-1083-2339/P2.

There is no zoning.

LOCATION : District : Bharuch

Latitudinal Range : Approx. 21° 70' to 21° 90' N [Atlas]

Longitudinal Range : Approx. 73° 54' to 73° 80' E [Atlas]

Nearest Town : Dediapada (10 km.)

Nearest Railhead : Ankleshwar (80 km.)

Nearest Airport : Vadodara (80 km.)

APPROACHES : From Vadodara to Kevadia Colony (approx. 70 km.), then to sanctuary (approx. 5 km.)

From Vadodara to Rajpipla (approx. 60 km.), on to Dediapada (approx. 30 km.), then to Sagai village (approx. 20 km.), inside the sanctuary.

TOPOGRAPHY AND CLIMATE :

Highest Point : 880 m

Lowest Point : 270 m

Maximum Temperature : 41.1 °C

Minimum Temperature : 5 °C

Mean Annual Rainfall : 1081 mm

FLORA : The sanctuary has fairly dense vegetation [FV], the main type being Slightly Moist Teak Forest 3B/C1(c). In the period 1986-88, there has been gregarious flowering of Bamboo (Dendrocalamus strictus); it is showing good regeneration [FV].

Between 1984-85 and 1986-87 an area of 330.47 ha. was planted with the following species : Tectona grandis, Acacia catechu, Ougenia oejinensis, Dendrocalamus strictus, Adina cardifolia, Terminalia tomentosa, Emblica officinalis, Ziziphus spp., Tamarindus spp., Pithecellobium dulce, Terminalia chebula, Terminalia bellirica, Aegle marmelos, Sterculia urens, Cassia fistula, Sapindus spp., Madhuca indica, Anona squarrosa, and Buchanania lanzan.

Also, between 1985-86 and 1987-88, an area of 20.50 ha. was planted with the following species for minor forest produce : Diospyros melanoxylon, Madhuca indica, Terminalia bellirica, Sapindus emarginatus, Pongamia pinnata, Tamarindus indica, Acadirachta indica, and others [Letter].

A small number of Eucalyptus spp. trees have been introduced in the sanctuary [FV].

Cassia callosa and Cassia tora are considered weeds in the area [FV].

FLORA : There is quite a range of mammals in this sanctuary, including many of India's more threatened ones [FV].

MAMMALS [Q1; FV]

Bear, Sloth
Boar, Indian Wild
Deer, Barking
Dog, Indian Wild (Dhole)
Fox, Indian
Hare, Indian
Hyena, Striped
Langur, Common
Leopard (Panther)
Macaque, Rhesus
Mongoose, Common
Porcupine, Indian
Sambar
Tiger

REPTILES [Q1; FV]

Cobra, Indian
Monitor, Common Indian
Python, Indian
Snake, Common Rat

The Tiger is reported to be a locally threatened species [FV].

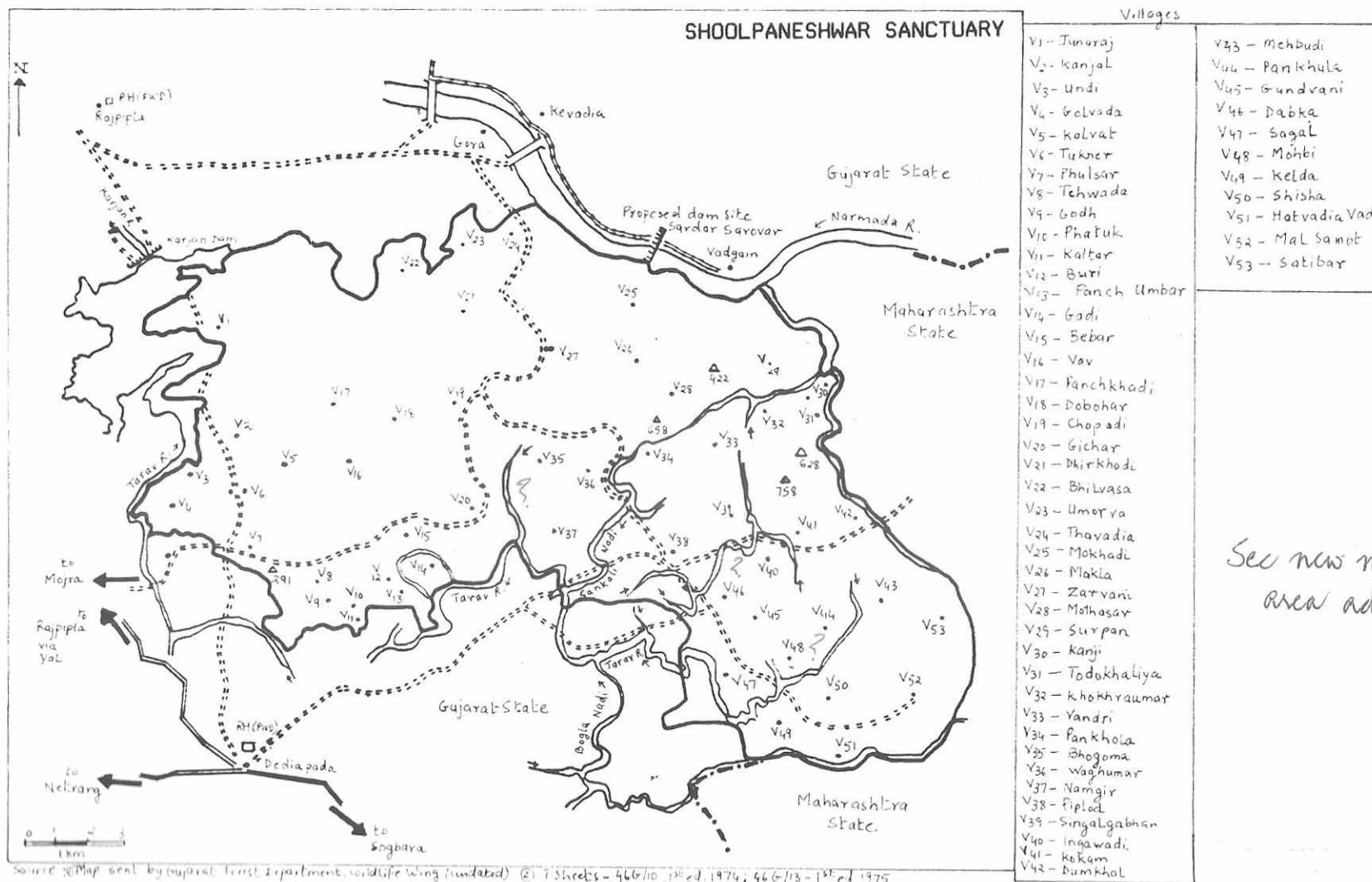
OCCURRENCE AND CONTROL OF DISEASE : No disease among flora and fauna has been reported [FV]. The nearest veterinarian is at Dediapada, 8 km. away.

OTHER FACTORS AFFECTING THE HABITAT : Forest fires recur in the dry season (December to May) affecting an average of 50 ha. per year. Counter measures, such as firelines (of 220 km length), have been made, and firewatchers employed.

Hot winds blow in the area in May, affecting about 50 ha. annually.

WATER RESOURCES : Devganga River flows along most of the sanctuary's eastern boundary, Narmada River along the north-eastern, and Tarav River along its southern and south-western border. The reservoir of the Karjan Dam, adjacent to the sanctuary, forms another major water source. In addition, there are three anicuts (two seasonal and one perennial), one earthen dam (perennial), and several (number not specified) natural waterholes, streams and springs, both perennial and seasonal.

The reservoir of the proposed Sardar Sarovar Dam will touch the sanctuary along the north-eastern boundary.



See new map for
area added

Shoolpaneshwar Sanctuary

1,94,138.00 (q a 91)

BUDGET : Rs. 1,92,000.00 for 1987-88 (down from Rs. 3,03,000.00 in 1986-87) [Statebudget]. 1988-89 = Rs 5,00,445/-

1989-90 = Rs 18,31,425/- (q a 91)

MANAGEMENT PLAN : None

PERSONNEL : One Range Officer, two Foresters, eight Orderly Guards, two Armed Police Constables, and one jeep driver. The Range Officer, stationed at Mosda, is locally in-charge. In addition to the wildlife staff, the following staff is stationed at the sanctuary for combined work : four Range Officers, 9 Foresters, and 26 Forest Guards.

Only one Range Forest Officer, two foresters and eight beat guards (q a 91)

EQUIPMENT : One jeep. In addition, five fixed and 10 portable wireless sets, two motor boats, and six motorcycles are with the Territorial Wing and usable for the sanctuary. Only one jeep. No other equipment made available yet.

RESEARCH AND MONITORING : Rishad Naoroji (affiliation not known) has studied raptors, while a Research Fellow of the M.S. University, Vadodara, is currently carrying out geological studies [FV].

No information (q a 91)

COMMUNITY INTERACTION PROGRAMMES : Educational programmes for local villagers and town-dwellers are undertaken, including camps, lectures, trips, and mobile photo exhibitions [FV].

HUMAN PRESENCE:

Rights and Leases : Local villagers have rights to graze their cattle and collect fuelwood and minor forest produce all over the sanctuary. They also have cultivation rights in the Revenue and Forest Village lands. About 200,000 kg. of fodder was allowed to be extracted from the sanctuary between 1986-87 and 1987-88, due to fodder scarcity in other parts of the State. Also allowed, till recently, was cutting of trees for pulp and other industrial uses. Since 1986, a five-year moratorium has been imposed on this.

Shoolpaneshwar Temple is situated on the sanctuary boundary, and attracts over 4000 pilgrims on an annual 3-day festival in May. These pilgrims have right of way through the sanctuary.

Habitation : There are 81 villages * (five of which are at present uninhabited), with a total population of 32,405. No information is available on population in surrounding areas.

Grazing : A total of 16,604 cattle and 2,750 goats from villages inside the sanctuary graze here. In addition, at least 5,500 cattle and 3,000 goats from adjacent villages come in to graze - the number is likely to be greater as these figures apply only to the sanctuary area as initially declared. Grazing is allowed throughout the sanctuary, except in the plantations [FV].

Offences and Illegal Activities : 157.24 ha. of area is encroached upon for cultivation.

Tourism : Full records are not maintained, but there are reported to be very few visitors [FV]. Between 1984-85 and 1987-88, a total of 1188 students attended nature education camps within the sanctuary [NEC].

1989-90 → No information regarding tourists (q a 91)

* The map sent to us by the wildlife authorities depicts a lesser number of villages. Unfortunately toposheets are not available for the entire sanctuary area, so it has not been possible to clarify this discrepancy.

Shoolpaneshwar Sanctuary

Use by Other Government Agencies : 41 km. of roads inside the sanctuary are controlled by the PWD. About 1000 people pass through the sanctuary on these roads annually. The Gujarat State Forest Development Corporation extracts minor forest produce from the sanctuary forests. The Forest Department has made 10.80 km of roads under the RLEGP scheme.

Miscellaneous : In 1983-84, 86 labourers were employed for construction of a rubble wall, 5 for road repairs, and 10 more for putting out fires.

Some cattle-lifting is reported by Leopard, Tiger, and Wild dog [FV]. So far only one case has been filed for compensation.

INFORMATION FOR VISITORS : October to January is the best period for visiting the sanctuary as the weather is pleasant. Shoolpaneshwar Temple is on the border of the sanctuary [FV].

Accommodation is available inside at a storehouse at Sagai village. There are several government rest houses at Rajpipla, Dediapada, and Kevadia, outside the sanctuary.

4 beds

20 beds

4 beds

NGOs/INDIVIDUALS ASSOCIATED : The World Wide Fund for Nature-India, (Vadodara and Surat branches), as well as the Surat Nature Club, are involved in nature education programmes related to the sanctuary.

CONTACT ADDRESSES :

Range Officer (WL)

HQ Mosda

Tal : Dediapada

Dist. Bharuch

Gujarat

Mosda PIN 393 040

Deputy Conservator of Forests, Rajpipla (East)

Rajpipla

District Bharuch - 393145

Gujarat

Range Officer

HQ Rajpipla

Tal. Nandod

Dist. Bharuch - 393 145

Gujarat

MANAGEMENT STATUS

WILDLIFE MANAGEMENT IN GUJARAT

A BIT OF NATURAL AND LEGAL HISTORY

The large land mass of Gujarat state can boast of a wide variety of natural ecosystems. While the southern part of the state has a predominance of moist deciduous forests (notably in the hilly Dangs region), the northern part is dominated by the unique Rann of Kutch, a vast salt desert. Most of the rest of the state has dry deciduous vegetation, including thorn forests, scrub, and grassland. But the state also has a long coastline, and the marine areas of the Gulf of Kutch and along the Saurashtra coast present an entirely different ecosystem. This includes the marine waters themselves, several small islands, coral reefs, and patches of mangrove forest.

A recent report of the Wildlife Institute of India indicates that of the 10 biogeographic zones * in India, four are found in Gujarat: the Indian Desert, the Semi-arid Zone, the Western Ghats, and the Coasts (Rodgers and Panwar, 1988b).

Such a diversity of ecosystems will naturally contain a wide range of wild animals and plants. Over 40 mammals and 425 birds are recorded in the state [Government of Gujarat, undated]. These include the world's last population of the Asiatic lion (Panthera leo persica), the only population of the Wild ass (Asinus hemionus khur) in India, and the country's largest single concentration of Blackbuck (Antelope cervicapra). The kaleidoscope of marine life includes 44 recorded species of corals, 70 species of sponges, and three of the world's most endangered sea turtles, the Green sea turtle (Chelonia mydas), the Leathery turtle (Dermochelys coriacea), and the Olive ridley turtle (Lepidochelys olivacea).

This rich natural heritage has unfortunately suffered great erosion in Gujarat. The single greatest threat has come from habitat destruction, especially a very rapid rate of deforestation. Hunting, too, has taken its toll, especially of larger cats. Nor have there, till recently, been any systematic attempts at conservation, notwithstanding the influence of the non-violent Jain faith and the scattered efforts of some communities (e.g. the villagers near Velavadar National Park who have been protective of the Blackbuck) and of some enlightened persons (such as the former Nawab of Junagadh who helped bring the lion back from the verge of extinction). Though three sanctuaries (Gir, Velavadar, and Nal Sarovar) were declared in the 1960s, it was only after the promulgation of the Wild Life (Protection) Act, in 1972, that a boost was given to the protection of wildlife habitats. In a decade from 1973 to 1982, two national parks and eight new sanctuaries were declared, and two of the existing sanctuaries were upgraded to national parks.

More recently, four more sanctuaries have been created. Excluding one of these sanctuaries (Rampura), for which no details of area are available, the network of protected areas in the state now covers over 8% of its total area (see Appendix 1). It must be remembered, however, that almost half this area is made up by newly declared Kutch Desert Sanctuary, extending over the Great Rann of Kutch. Excluding this, and

* Biogeographic zones are defined as "large distinctive units of similar ecology, biotic representation, community and species." (Rodgers and Panwar, 1988a)

the Dhrangadhra Sanctuary, both of which have only marginal areas under forest, the national parks and sanctuaries of the state cover nearly 20% of its designated forest area (16.34 lakh ha.). The distribution of these parks and sanctuaries among the four biogeographic zones of Gujarat is as follows (Rodgers and Panwar, 1988b):

<u>Biogeographic Zone</u>	<u>National Park / Sanctuary</u>
Indian Desert	Dhrangadhra Sanctuary, Kutch Desert Sanctuary, Narayan Sarovar Sanctuary
Semi-arid	Gir National Park, Velavadar National Park, Barda Sanctuary, Hingolghadh Sanctuary, Jessore Sanctuary, Khijadia Sanctuary, Nal Sarovar Sanctuary, Ratanmahal Sanctuary, Shoolpaneshwar Sanctuary
Western Ghats	Bansda National Park
Coasts	Marine National Park and Sanctuary

(Relevant information was not available for Ganga Great Indian Bustard Sanctuary, Porbandar Sanctuary, and Rampura Sanctuary.)

MANAGEMENT STRUCTURE

Gujarat's national parks and sanctuaries are under the overall control of its Forest Department, and within that of the Wildlife Wing. This Wing was established in 1970 [Government of Gujarat 1984]. It is today headed by a Chief Conservator of Forests, who is also designated the state's Chief Wildlife Warden (CWLW). The CWLW is helped in his tasks by four Conservators of Forest, stationed at Jamnagar, Vadodara, Junagadh, and Surat, each of whom is in overall charge of one or more national parks and/or sanctuaries. The officials locally in-charge in each park/sanctuary are of the level of Deputy Conservator of Forests (in the case of Gir National Park), Assistant Conservator of Forests, or Range Officers.

NATURE EDUCATION PROGRAMMES

An integral and important part of Gujarat's conservation efforts has been its nature education programme, one of the few systematic efforts of the kind by a state government in India. As is often the case, the initial thrust for such a programme came from a non-governmental organisation, the World Wide Fund for Nature-India (formerly World Wildlife Fund - India). In 1975, it organised a nature education camp at Hingolghadh in Rajkot district, now a Sanctuary. In 1977 the state Forest Department stepped in with financial aid. Since then several hundred camps (201 from 1978 to 1983; more recent figures are not available) have been held by the Department, by WWF-I, and by a number of other voluntary groups [Sinha 1984]. Thousands of school children have attended these camps, from both urban and rural areas. Many of the state's parks and sanctuaries have been used for the purpose, the most popular being Gir, Hingolghadh, and Marine. Hingolghadh, in fact, is perhaps India's only sanctuary created especially for nature education purposes [Anon undated].

MANAGEMENT STATUS : A PROFILE

The declaration of a wildlife habitat as a national park or sanctuary does not by itself ensure its effective protection. A number of other measures are needed for this, including complete implementation of the Indian Wild Life (Protection) Act of 1972, harmonisation,

prevention or control of human activities in the area, building up and implementation of management plans, and provision of adequate staff, funds, equipment, and research inputs. India has today one of the world's most extensive networks of protected areas, but unfortunately the creation of such a network has not been followed up by adequate ground-level management (for a detailed analysis of the national status, see Kothari, Pande, Singh, and Variava, 1989). How has Gujarat as a state fared? *Let al (is good chadig? be enough!)*

Table 1 *below* gives a quick overview of the status of various critical management parameters in each of the national parks and sanctuaries of Gujarat. Greater details on these parameters are given in the individual directory sheets. The last few columns in the table also provide a consolidated statement for the whole state. The picture that emerges is categorised into four heads: legal status, ecological factors, human presence and management

Legal Status : The completion of legal procedures, as laid down in the Wild Life (Protection) Act, is essential for the proper management of a national park or sanctuary. It must be kept in mind that the set of procedures applicable to a national park is different to that applicable to a sanctuary. In the latter case, an area is first declared a sanctuary (under Section 18 of the Act), and then steps are taken to determine, extinguish, acquire or otherwise adjust the existing rights of people in the area (Sections 19 to 26 of the Act). In the case of a national park, an intention to constitute an area as a national park is first declared (Section 35 of the Act), then all the steps prescribed for a sanctuary (Sections 19 to 26) are followed, and only then is the area notified a national park (Section 35 (4) of the Act).

Legal procedures are, therefore, considered completed for a sanctuary if all the rights and leases have been settled, either under the 1972 Act or under any previous act. For a national park, however, completion is achieved only when the final notification is issued.

Table 2 shows that of the four national parks in Gujarat, two have been finally notified, and a part of the areas of both of the remaining has also been finally notified. The sanctuaries are in far worse a situation: of the ten sanctuaries, procedures are complete for only one, and for another they are complete for a part of the area. The remaining eight have not completed their legal procedures.

It would seem therefore that national parks are being accorded greater attention than sanctuaries. But this may be only nominal - as will be pointed out below, all the national parks still have human activities within them, and three of the four continue to have human habitation inside.

Ecological Factors: Of the many physical and biological factors which have a bearing on the management of an area, some critical ones are periodic occurrences like fire and drought, and outbreaks of disease among the wildlife. These factors can often reach serious proportions, threatening the habitat and the wild flora and fauna, and therefore need counter-measures.

Three of the four national parks and five of the 10 sanctuaries reported the existence of periodic or occasional fires. In all the affected parks and all but two of the affected sanctuaries, some counter-measures were being taken.

Drought was reported from three of the four national parks and eight of the 10 sanctuaries. This is not surprising, in view of the fact that much of Gujarat is drought-prone. On the positive side,

again, counter-measures have been taken in all the affected national parks and five of the affected sanctuaries.

It must be noted that without a deeper analysis, it is not possible either to judge the impact of fire and drought on the ecosystem and its constituents, or to assess the adequacy of the counter-measures adapted.

Disease among animals has been reported from two of the four national parks and one of the 10 sanctuaries. Since diseases to ungulates are often the result of contact with livestock, vaccination of the latter is an important step in tackling this problem. Such a vaccination programme has been carried out in one of the affected national parks, but not in the other, nor in the affected sanctuary. On the other hand one park and one sanctuary which have not reported diseases, have had vaccination carried out, perhaps as a precautionary measure.

Disease among plants was also reported from two of the four national parks and one of the 10 sanctuaries. Counter-measures have not been reported from any of these.

It must be stressed that surveillance regarding diseases among flora and fauna is neither regular nor adequate in our wildlife areas, hence the incidence of both is likely to be higher than reported above. It is also not possible to comment, at this level of analysis, either on the impact of these diseases on flora-fauna populations, or on the adequacy of the counter-measures taken.

Human Presence : Very few wildlife habitats in India are completely free of human presence; there are none in Gujarat. Adequate protection to these areas can therefore only be given if human activities in them are oriented to harmonise with the habitat and the wildlife, or are altogether eliminated. But at the same time, it is essential to keep in mind that wildlife protection against human interests cannot succeed for long, especially if it results in alienating local communities.

The situation with regard to human presence in Gujarat's national parks and sanctuaries appears, at least prima facie, to be rather alarming. All the national parks and sanctuaries report the existence of rights, leases, or concessions within them. This ranged from one sanctuary which had only right of way, to several which had agriculture, grazing, settlements, mining, and a host of other activities concentrated together.

Three of the national parks and six of the 10 sanctuaries had permanent human habitation inside. In addition, one sanctuary reported temporary camps of graziers. Those reporting permanent habitation include two national parks which have been finally notified, where, according to the Wild Life (Protection) Act, such settlements are not legally permissible. This is one of the more glaring anomalies in the management of Gujarat's wildlife reserves.

Grazing, legal or illegal, exists in three of the four national parks and all of the sanctuaries. The only area where it is not reported is Marine National Park, where it would not be expected anyway.

Perhaps most worrying is the presence of illegal activities in all the national parks and sanctuaries of the state. Of course the range and intensity of such activities differs considerably from area to area, but the fact that not a single area is free of them is fairly significant in itself.

Tourism exists in three of the four national parks and eight out of

9 sanctuaries (one sanctuary kept no records of tourism). The fourth national park, Bansda, was not yet open to tourists, but nevertheless it has also had a few visitors. Several areas, however, reported very insignificant levels of tourist activity, perhaps because they are hardly known to the public.

Another of the glaring anomalies of wildlife management in Gujarat is the existence of activities by government departments and agencies other than the wildlife authorities inside the national parks and sanctuaries. Such activities are forbidden in national parks and illegal, without the permission of the Chief Wildlife Warden, in sanctuaries. Even in sanctuaries, they have to be in consonance with wildlife management. All the national parks and eight of the 10 sanctuaries reported such activities, ranging from road maintenance to target practice by the military.

Given that one of the major human activities in Gujarat's parks and sanctuaries is fuel and fodder collection, an important step in reducing pressure would be to raise fuel and fodder plantations. None of the four national parks, and only 4 of the 10 sanctuaries, reported the existence of such plantations.

Just as human activities can affect wildlife, certain actions of wild animals can harm the interests of humans too. Before wildlife areas were taken over by the state government for control and management, such conflicts of interest were managed by local communities themselves. But the responsibility of tackling them now rests squarely on the wildlife authorities, and so their range and frequency become an important factor in management. In Gujarat, two of the four national parks, and fortunately only two of the ten sanctuaries, reported attacks on humans by wild animals. Such attacks on livestock are more common, reported from three of the parks and three of the sanctuaries. Crop damage by wild animals was reported from two parks and two sanctuaries.

Payment of cash compensation is one way of reducing the economic losses suffered by people due to instances of wildlife attack on humans, livestock, or crops, though it can never, of course, fully compensate. In Gujarat, of the two parks and two sanctuaries reporting human injury or death, one park had paid compensation, one sanctuary had claims pending, and the second sanctuary had not had any claims filed. No information was available on the second park. Of the three parks and three sanctuaries reporting livestock injury or death, compensation was paid in two of the parks, and no claims were made in the third park. Claims were pending for one sanctuary, no claim was made for another sanctuary, and compensation was not payable at all in the third sanctuary. In the case of crop damage, compensation was not payable in one of the two parks and in both the sanctuaries which reported such damage. In one park it was payable, but no claims had been made by the affected farmers.

Conflicts between wildlife and local human communities, illegal activities, or tension with wildlife authorities are factors that can lead to physical clashes between local people and wildlife officials. Such clashes have been reported from all the four national parks, and three of the 10 sanctuaries. This is clearly alarming.

Management Activities and Facilities : Amongst the first management inputs that are needed to tackle the multiple problems outlined above, is a management plan. Such a plan "should identify the major objectives of the park/sanctuary, assemble comprehensive background data, establish the relationship of different factors to each other, identify the priority areas and strategies for protection and management, and indicate locations for buildings and facilities" (Kothari, Pande, Singh,

and Variavā, 1989).

Gujarat's record in this respect is not particularly impressive. Only one national park and not a single sanctuary has a management plan which has been approved. One other park and two other sanctuaries have management plans, but these plans have not been approved within the period for which they were valid. One other sanctuary has a plan being prepared for it. This leaves a total of two out of four national parks and seven out of 10 sanctuaries for which a management plan has neither been prepared nor is under preparation.

Management of wildlife reserves also requires financial inputs, for staff salaries, protection and management work, equipment, research, and so on. For proper long-term planning and for relative independence in the functioning of the park or sanctuary authorities, it is necessary that each area have a separate budget. Gujarat appears to have fully accepted this principle, for all the four national parks and all but one of the sanctuaries have a separate budget.

Also commendable is the fact that every one of the parks and sanctuaries has personnel stationed in it, though the number and level of staff members varies considerably. Equipment for use by the staff is also available in all the national parks and eight of the 10 sanctuaries; there is again considerable variation in the kind and quantity of equipment.

Zonation of the area of a national park or sanctuary has been considered essential for proper protection and management. A report of the Indian Board for Wildlife on eliciting public support for wildlife conservation states: "Of over-riding and primary importance is the need for each individual reserve to adopt a 'core-buffer-multiple use surrounds' structure, wherein a restricted forest i.e. buffer surrounds the core insulating it from an outer multiple use area, the last comprising forests and villages where land use practices are compatible with wildlife conservation." (Indian Board for Wildlife, 1983)

In Gujarat, zoning has been done in only one national park and one sanctuary. In one other case, Gir, such zoning previously existed and is still informally considered valid, with the finally notified national park area being treated as a core zone to the larger area for which intention to constitute into a national park has been declared. But the vast majority of the state's parks and sanctuaries have no zoning whatsoever.

Proper management of a wildlife reserve requires an adequate data base, which can be obtained only by appropriate research. Also essential is the monitoring of habitat changes, of flora and fauna, and of management activities themselves. Research and monitoring have usually been given very little attention in Indian wildlife reserves; in Gujarat, the situation is not terribly grim, but it is not altogether happy either. Three of the four national parks and five of the 10 sanctuaries reported the presence of research and monitoring activities.

It is at this stage important to clarify that in the absence of more detailed analysis, it is not possible to judge the quality and adequacy of the above-mentioned management inputs. How good or bad are the management plans, how adequate are the budgets, how qualified and adequate is the staff, and how appropriate is the equipment, cannot be determined at this level of analysis.

One final parameter of importance to management is the interaction of the wildlife authorities with the local people. As mentioned earlier, many of Gujarat's parks and sanctuaries have tension and

clashes between officials and people. Building up a relationship of harmony and mutual support requires not only a sensitivity to the needs of the local communities, but also an active extension programme amongst them. Of vital importance in this would be the involvement of non-governmental organisations and individuals who could mediate between officials and local people. Such NGOs and NGIs could also help in research, and perhaps most importantly, in monitoring the success or failure of management strategies.

In Gujarat, two of the four national parks and four of the 10 sanctuaries reported having community extension/interaction programmes, and all four national parks along with six of the 10 sanctuaries had the involvement of NGOs/NGIs. As mentioned in the previous section, Gujarat has a very active nature education programme, and it is in this that many NGOs/NGIs actively participate.

Table 1 : STATUS OF MANAGEMENT PARAMETERS IN NATIONAL PARKS & SANCTUARIES OF GUJARAT

															TOTAL		
															YES	NO	OTHER
															N S	N S	N S
LEGAL STATUS																	
Completion of legal procedures	Y	Y/N1	Y	Y/N1	N	N	Y	N	N	N	Y/N1	N	N	N	2	1	0 8 2 1
ECOLOGICAL FACTORS																	
Fire occurrence	Y	Y	N	Y	N	Y	Y11	Y	N	N	N	N	Y	Y	3	5	1 5
Fire counter-measures	Y	Y	I	Y	I	N	N	Y	I	I	I	I	Y	Y	3	3	0 2
Drought occurrence	Y	Y	N10	Y	Y	Y	Y	Y	Y	N10	Y	Y	Y	N	3	8	1 2
Drought counter-measures	Y	Y	I	Y	?	Y	Y	Y	N	I	N	Y	Y	I	3	5	0 2
Diseases among fauna	N	Y	N	Y	N	Y	N	N	N	N	N	N	N	N	2	1	2 9
Diseases among flora	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	2	1	2 9
Vaccination programme	Y	N	N	Y	N	N	N	N	N	N	N	Y	N	N	2	1	2 9
HUMAN PRESENCE																	
Rights/Leases/Concessions	Y	Y	Y	Y	Y	Y	Y	Y	Y5	Y	Y7	Y	Y	Y	4	10	0 0
Human habitation inside	Y	Y	Y	N	Y	Y	N	Y	N	N	N8	Y	Y	Y	3	6	1 3 0 1
Grazing	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	3	10	1 0
Offences/Illegal activities	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	4	10	0 0
Tourism	N3	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	?	Y	Y	3	8	0 1 1 1
Use by other government agencies	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	4	8	0 2
Fuel-fodder plantations	N	N	N	N	N	Y	Y	Y	N	N	N	Y	N	N	0	4	4 6
Wildlife attacks on humans	Y	Y	N	N	N	N	N	Y	N	N	N	N	Y	N	2	2	2 8
Wildlife attacks on livestock	Y	Y	N	Y	Y	N	N	N	N	N	N	N	Y	Y	3	3	1 7
Crop damage by wildlife	N	Y	N	Y	N	Y	N	N	N	N	Y	N	N	N	2	2	2 8
Compensation for attacks on humans	?	Y	I	I	I	I	I	Y12	I	I	I	I	Y13	I	1	2	0 0 3 8
Compensation for attacks on livestock	Y	Y	I	Y13	N	I	I	I	I	I	I	I	Y13	Y12	3	2	0 1 1 7
Compensation for crop damage	I	N	I	Y13	I	N	I	I	I	I	N	I	I	I	1	0	1 2 2 8
Clashes	Y	Y	Y	Y	N	N	N	N	N	Y	Y	N	Y	N	4	3	0 7
MANAGEMENT																	
Management plan	Y2	Y	N	N	Y2	Y2	N	N	N	N	N6	N	N	N	1	0	2 7 1 3
Separate budget	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	4	9	0 1
Personnel	8	187	38*	22	9	36	5	11	5	38*	38	12	3	53	4	10	0 0
Equipment	Y	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y	4	8	0 2
Zoning	Y	N4	N	N	N	N	N	N	N	N	Y	N	N	N	1	1	2 9 1 0
Research and monitoring	N	Y	Y	Y	N	Y	N	N	Y	Y	N	N	Y	Y	3	5	1 5
Extension/Interaction programmes	N	Y	Y	N	N	N	N	N	Y	Y	N	N	Y	Y	2	4	2 6
NGO/NGI involvement	Y	Y	Y	Y	N	N	Y	N	Y	Y	Y	N	Y	Y	4	6	0 4

NOTE : Y = Yes N = No I = Irrelevant ? = Information not available

1. Final notification has been issued for only a part of Gir and Velavadar National Parks, and Nal Sarovar Sanctuary.
2. Plan prepared but not approved
3. Though the area is not open to tourists, a small number of visitors do go there
4. Though intention has been declared to constitute the entire Gir area into a national park, the part for which final notification has not been issued is still considered as a sanctuary, forming a buffer zone to the finally notified national park
5. Only right of way through the sanctuary
6. Under preparation; Vol. 1, a broad overview, is ready
7. Only root and grass collection allowed

8. Temporary camps are however set up by graziers inside the sanctuary
9. No records kept
10. Drought on the mainland has an indirect impact on the Marine Park and Sanctuary (see Directory sheet for details)
11. Fires are rare
12. Compensation claim pending
13. No compensation claims
- * 38 staff members are shared between Marine National Park and Marine Sanctuary

APPENDICES

Appendix 1

AREA AND DATES OF NOTIFICATION OF NATIONAL PARKS AND SANCTUARIES OF GUJARAT

Name Area (in ha.) Date(s) of notification

National Parks

EVANSDA	2399.00	1976
GIR	141213.15	1965 & 1974 ¹
MARINE	16289.20	1980 & 1982 ²
VELAVADAR	3408.11	1969 & 1975 ³
Total Parks area	163309.46	(1633.09 sq.km.) ⁴

Sanctuaries

BARDA	18025.13	1979
DHRANGADHRA	495370.00	1973
GAGA GREAT INDIAN EUSTARD	332.87	1988
HINGOLGADH	654.07	1980
JESSORE	18066.27	1978
KHIJADIYA	604.86	1981
KUTCH DESERT	750622.12	1986
MARINE	29503.00	1980
NAL SAROVAR	12082.20	1969
NARAYAN SAROVAR	30754.53	1981
PORBANDAR	9.33	1988
RAMPURA	?	?
RATANMAHAL	5565.13	1982
SHOOLPANESHWAR	44818.70	1982

Total Sanctuaries area 1406408.21 (14064.08 sq.km)⁵

Total area under Parks and Sanctuaries 1569717.67 (15697.18 sq.km)⁶

- 1 Gir was notified a Sanctuary in 1965, and a National Park in 1974
- 2 Velavadar was notified a Sanctuary in 1969, and a National Park in 1975
- 3 Marine Sanctuary was notified in 1980, and the National Park in 1982
- 4 0.83% of the total area of the state (1.96 crore ha.)
- 5 7.18% of the total area of the state (excluding Rampura Sanctuary)
- 6 8.01% of the total area of the state (excluding Rampura Sanctuary)

Why NPS names in caps?

* why NPS names in caps?

Appendix 2:

REFERENCE NUMBERS OF SURVEY OF INDIA TOPOGRAPHICAL SHEETS RELEVANT TO NATIONAL PARKS AND SANCTUARIES OF GUJARAT #

National Parks

Bansda : 46H/5, 6
Gir : 41O/4; 41L/9, 10, 13; 41K/7, 8, 11, 15; 41P/1, 2
Marine : 41F/3; 41F/4 & 41B/16^{**}; 41F/6 & 41F/7; 41F/8, 11, 14, 15; 41J/2, 3, 5, 6
Velavadar : 46B/4; 41N/16

Sanctuaries

Barda : 41G/9, 10, 13, 14
Dhrangadhra : 41M/1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 16; 41J/1, 2, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 16; 40P/2, 3, 4, 6, 7, 8
Hingolghadh : 41N/3
Jessore : 45D/6*, 7*, 10*, 11*
Khijadiya : 41J/2, 3
Marine : (same as Marine National Park)
Nal Sarovar : 41N/13, 14; 46B/1, 2
Narayan Sarovar : 41A/6, 10, 11, 14
Ratanmahal : 46J/2*
Shoolpaneshwar : 46G/9, 10, 13, 14

Scale 1 : 50,000

* Unrestricted topographical sheets

** The same sheet has two numbers

Appendix 3: TREES REPORTED FROM NATIONAL PARKS AND SANCTUARIES OF GUJARAT

Scientific Name (Vernacular Name)

NBAN NGIR NIMAR NVEL SBAR SDHR SHIN SJES SKHI SNAL SNAR SRAT SSHO
SMAR

Acacia catechu (Khair, Khari)	*	*				*				*	*
Acacia ferruginea (Bawal, Kagar, Kanti)	*									*	*
Acacia leucophloea (Amiar, Aniyar, Harmo baval, Harmu baval, Pilo baval)	*	*			*	*				*	*
Acacia nilotica (Babul, Baval, Kalo baval)	*	*	*	*	*	*	*	*	*	*	
Acacia planifrons (Chatri baval)										*	
Acacia polycantha (Gorad)						*					*
Acacia senegal (Gorad)		*	*	*		*	*			*	
Acacia tortilis (Israeli baval)					*	*				*	
Aegle marmelos (Bel, Bili, Billi, Bilu)	*	*				*				*	*
Ailanthus excelsa (Arduso)										*	*
Alangium salvifolium (Ankol)										*	*
Albizia lebbeck (Kalo sarsado, Siras, Siris, Sirish)	*					*			*	*	
Albizia odoratissima (Kalosiras, Sarasado)						*			*		*
Albizia procera (Dhole siras, Kelvo, Kilai)	*									*	*
Anacardium occidentale (Kaju)										*	*
Anogeissus latifolia (Dhamoda, Dhamodo, Dhavdo, Safed dhav)	*					*	*		*	*	*
Anogeissus pendula (Kaladhav)						*					*
Annona squamosa (Sitaphal)											*
Avicennia marina (Cher, Tavar)			*								
Avicennia officinalis (Tavar)			*								
Azadirachta indica (Limdo, Neem, Moti limbado)	*					*	*	*	*	*	*
Bauhinia purpurea (Chameli, Kasan)										*	*
Bauhinia racemosa (Ashitra, Asotri, Asundro, Ingor)	*	*			*					*	*
Bombax ceiba (Sawar, Semar, Semio, Simlo)	*	*				*				*	*
Borassus flabellifer (Tad)										*	*
Boswellia serrata (Gugal, Salada)						*				*	*
Bridelia crenulata (Asan, Datio)	*									*	*
Bridelia squamosa (Asan)											*
Bruguiera gymnorrhiza (Sanwar)			*								*
Buchanania lanzan (Charoli)	*									*	*
Butea monosperma (Kakhar, Khakhar, Khakhro, Palas)	*	*			*	*	*		*	*	*
Capparis grandis (Dumro)									*		*
Careya arborea (Kumbhi)											*
Casuarina graveolens (Dedak manjo)											*
Cassia fistula (Bahavn, Bhava, Garmalo)	*	*		*		*					*
Cassia siamea (Kasid)									*		*
Casuarina equisetifolia (Saru)									*		*
Ceriops tagal (Karod)			*								*
Cochlospermum religiosum (Derani)											*
Cocos nucifera (Naliyeri)	*							*			*
Cordia dichotoma (Gundi)									*		*
Crateva magna (Kanki)											*
Dalbergia latifolia (Shisham, Sisam, Sisham)	*					*				*	*
Dalbergia paniculata (Padri, Patrali)	*									*	*
Dalbergia sissoo (Sisoo, Sissoo)		*				*					*
Delonix elata (Sandasado, Sandhesro)								*			*
Delonix regia (Gulmahor, Gulmor)								*			*
Derris indica (Karanj)		*								*	*
Dillenia pentagyna (Kevlu)											*
Diospyros melanoxylon (Timru)	*	*				*				*	*
Dolichandrone falcata (Metar sing)											*
Drypetes roxburghii (Jetun)											*
Elaeodendron roxburghii (Alan)											*
Embelia tsjeriam-cottam (Kikla)	*										*
Emblia officinalis (Ambla, Amla, Awal)	*	*				*				*	*
Erythrina variegata (Pangaro)											*
Eucalyptus spp. (Nilgiri)						*					*

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NBAN NGIR NMAR NVEL SBAR SDHR SHIN SJES SKHI SNAL SNAR SRAT SSHD
 SMAR

<i>Terminalia arjuna</i> (Arjun sadad)					*				
<i>Terminalia bellirica</i> (Bahedo, Behda, Behdo, Beheda)	*	*			*			*	*
<i>Terminalia chebula</i> (Hirdo)									*
<i>Terminalia crenulata</i> (Sadad)	*	*							*
<i>Thespesia populnea</i> (Paras pipdo)							*		
<i>Trema orientalis</i> (Gol, Gota, Khargol)					*				*
<i>Wrightia tinctoria</i> (Dudhi, Dudhlo, Kadav, Kudi, Kudi (moti))	*	*			*			*	*
<i>Wrightia tomentosa</i> (Dudhi, Kuda)	*							*	
<i>Xerophis spinosa</i> (Ghela, Mindhol)	*							*	*
<i>Ziziphus mauritiana</i> (Bor, Bordi)	*	*		*	*			*	*
<i>Ziziphus xylopyrus</i> (Cath bor, Gathbor, Ghatbor, Ghatboz)	*			*	*			*	*

SOURCES

The above list of trees has been compiled from the following sources (for full references please see individual directory sheets and 'References and Bibliography') :

NBAN	- Q1, Scheme	SJES	- Q1
NGIR	- Q1, BRO, Chavan-b, Chavan-c, Berwick, Rashid, Sinha	SKHI	- Q1
NMAR	- Q1, BRO/MAR 3, Parmar, Anon, FV	SNAL	- Q1
NVEL	- Q1	SNAR	- Q1
SBAR	- Q1	SRAT	- Q1, WP
SDHR	- Q1, MP, FV	SSHO	- Q1
SHIN	- Q1		

KEY

Species whose :

- 1 : Generic name has changed (see List 1)
- 2 : Specific name has changed (see List 2)
- 3 : Generic and specific names have changed (see List 3)
- 4 : Genus is now obsolete and split into several genera

LIST 1

CURRENT NAME	OBSOLETE NAME	CURRENT NAME	OBSOLETE NAME
<i>Delonix elata</i>	<i>Poinciana elata</i>	<i>Manilkara hexandra</i>	<i>Mimusops hexandra</i>
<i>Delonix regia</i>	<i>Poinciana regia</i>	<i>Mitragyna parvifolia</i>	<i>Nauclera parvifolia</i>
<i>Drypetes roxburghii</i>	<i>Putranjiva roxburghii</i>	<i>Radermachera xylocarpa</i>	<i>Bignonia xylocarpa</i>
<i>Haldina cordifolia</i>	<i>Adina cordifolia</i>	<i>Tecomella undulata</i>	<i>Tecoma undulata</i>
<i>Leucaena leucocephala</i>	<i>Mimosa leucocephala</i>		

LIST 2

Bombax ceiba
 Boswellia serrata
 Bridelia crenulata
 Buchanania lanzan
 Butea monosperma
 Ceriops tagal
 Cochlospermum religiosum
 Cordia dichotoma
 Crateva magna
 Embelia tsjeriam-cottan
 Erythrina variegata
 Ficus amplissima
 Ficus racemosa

Bombax malabaricum
 Boswellia glabra
 Bridelia retusa
 Buchanania latifolia
 Butea frondosa
 Ceriops candolleana
 Cochlospermum gossypium
 Cordia obliqua
 Crateva nurvala
 Embelia robusta
 Erythrina indica
 Ficus tsiela
 Ficus glomerata

Flacourtia indica
 Grewia pilosa
 Heterophragma quadriloculare
 Lagerstroemia microcarpa
 Moringa oleifera
 Ougeinia oojeinensis
 Prosopis cineraria
 Schleicheria oleosa
 Spondias pinnata
 Syzygium cumini
 Terminalia alata
 Ziziphus mauritiana

Flacourtia sepiaria
 Grewia flavescens
 Heterophragma roxburghii
 Lagerstroemia lanceolata
 Moringa pterygosperma
 Ougeinia dalbergiodes
 Prosopis spicigera
 Schleicheria trijuga
 Spondias mangifera
 Syzygium jambolanum
 Terminalia tomentosa
 Ziziphus jujuba

LIST 3

Azadirachta indica
 Derris indica
 Emblica officinalis
 Lannea coromandelica
 Miliusa tomentosa

Melia azadirachta
 Pongamia pinnata
 Phyllanthus emblica
 Odina wodier
 Saccopetalum tomentosum

Naringi crenulata
 Peltophorum pterocarpum
 Xeromphis spinosa

Limonea acidissima
 Inga pterocarpa
 Randia dumetorum or
 Randia brandisii

Reference Sources for Name Changes : Chandra and Gaur 1988;
 Saldanha and Nicolson 1976; Saldanha 1984; Council of Scientific and Industrial Research 1986

SCIENTIFIC, ENGLISH, AND FAMILY NAMES OF TREES LISTED IN APPENDIX 3

Scientific Name	Common/English Name	Family
<i>Acacia catechu</i>	Cutch Tree	Fabaceae
<i>Acacia ferruginea</i>		Fabaceae
<i>Acacia leucophloea</i>	White Barked Acacia	Fabaceae
<i>Acacia nilotica</i>	Babul	Fabaceae
<i>Acacia planifrons</i>	Umbrella Acacia	Fabaceae
<i>Acacia polycantha</i>	White Cutch	Fabaceae
<i>Acacia senegal</i>	Gum Arabic Acacia	Fabaceae
<i>Acacia tortilis</i>		Fabaceae
<i>Aegle marmelos</i>	Bael Tree	Rutaceae
<i>Ailanthus excelsa</i>	Tree-of-Heaven	Simaroubaceae
<i>Alangium salvifolium</i>		Alangiaceae
<i>Albizia lebbeck</i>	Indian Walnut, East Siris Tree, East Indian Walnut	Fabaceae
<i>Albizia odoratissima</i>	Black Siris	Fabaceae
<i>Albizia procera</i>	White Siris	Fabaceae
<i>Anacardium occidentale</i>	Cashew Nut Tree	Anacardiaceae
<i>Anogeissus latifolia</i>	Axle-Wood Tree	Combretaceae
<i>Anogeissus pendula</i>	Kardahi	Combretaceae
<i>Annona squamosa</i>	Custard Apple	Annonaceae
<i>Avicennia marina</i>	White Mangrove Tree	Verbenaceae
<i>Avicennia officinalis</i>	White Mangrove Tree	Verbenaceae
<i>Azadirachta indica</i>	Neem Tree, Margosa Tree, Persian Lilac	Meliaceae
<i>Bauhinia purpurea</i>	Purple Bauhinia	Fabaceae
<i>Bauhinia racemosa</i>	White Bauhinia	Fabaceae
<i>Bombax ceiba</i>	Silk Cotton Tree	Bombacaceae
<i>Borassus flabellifer</i>	Palmyra Palm	Arecaceae
<i>Boswellia serrata</i>	Indian Olibanum Tree, Indian Frankincense	Burseraceae
<i>Bridelia crenulata</i>	Kasi	Euphorbiaceae
<i>Bridelia squamosa</i>		Euphorbiaceae
<i>Bruguiera gymnorhiza</i>		Rhizophoraceae
<i>Buchanania lanzan</i>	Almondette Tree, Cheronjee	Anacardiaceae
<i>Butea monosperma</i>	Flame of the Forest	Fabaceae
<i>Capparis grandis</i>		Capparaceae
<i>Careya arborea</i>	Ceylon Oak	Lecythidaceae
<i>Casaria graveolens</i>		Samydaceae
<i>Cassia fistula</i>	Indian Laburnum	Fabaceae
<i>Cassia siamea</i>	Siamese Tree Senna	Fabaceae
<i>Casuarina equisetifolia</i>	Casuarina, Cassie	Casuarinaceae
<i>Ceriops tagal</i>		Rhizophoraceae
<i>Cochlospermum religiosum</i>	Yellow Silk Cotton Tree	Cochlospermaceae
<i>Cocos nucifera</i>	Coconut Palm	Arecaceae
<i>Cordia dichotoma</i>		Eoraginaceae
<i>Crateva magna</i>	Crateva	Capparaceae
<i>Dalbergia latifolia</i>	East Indian Rosewood, Bombay Blackwood, Roseapple	Fabaceae
<i>Dalbergia paniculata</i>		Fabaceae
<i>Dalbergia sissoo</i>	Sissoo	Fabaceae
<i>Delonix elata</i>	White Gold Mohur	Fabaceae
<i>Delonix regia</i>	Flamboyant Flame Tree, Gul Mohr, Gold Mohur	Fabaceae
<i>Derris indica</i>		Fabaceae
<i>Dillenia pentagyna</i>	Dillenia	Dilleniaceae
<i>Diospyros melanoxylon</i>	Coromandel Ebony, Persimmon, Bidi Leaf Ebony	Ebenaceae

Scientific Name	English Name	Family
<i>Dolichandrone falcata</i>		Bignoniaceae
<i>Drypetes roxburghii</i>	Child Life Tree	Euphorbiaceae
<i>Elaeodendron roxburghii</i>		Celastraceae
<i>Erbelia tsjeriam-cottam</i>		Myrsinaceae
<i>Erblica officinalis</i>	Erblic Myrobalan, Indian Gooseberry	Euphorbiaceae
<i>Erythrina variegata</i>	Indian Coral Tree	Fabaceae
<i>Eucalyptus</i> spp.	Eucalypt	Myrtaceae
<i>Ficus amplissima</i>		Moraceae
<i>Ficus benghalensis</i>	Banyan	Moraceae
<i>Ficus hispida</i>		Moraceae
<i>Ficus racemosa</i>	Gular	Moraceae
<i>Ficus religiosa</i>	Peepal Tree	Moraceae
<i>Flacourtia indica</i>		Flacourtiaceae
<i>Garuga pinnata</i>	Garuga	Burseraceae
<i>Gnelina arborea</i>	Gomari, Ganhar	Verbenaceae
<i>Grewia pilosa</i>	Grewia	Tiliaceae
<i>Grewia tiliifolia</i>	Dhaman	Tiliaceae
<i>Haldina cordifolia</i>	Haldu	Rubiaceae
<i>Heterophragma quadriloculare</i>		Bignoniaceae
<i>Holarrhena antidysenterica</i>	Conessia Holarrhena	Apocynaceae
<i>Holoptelea integrifolia</i>	Indian Elm, Kanju	Ulmaceae
<i>Hymenodictyon excelsum</i>	Kuthan	Rubiaceae
<i>Kydia calycina</i>	Pula	Malvaceae
<i>Lagerstroemia microcarpa</i>	Benteak, Nana	Lythraceae
<i>Lagerstroemia parviflora</i>	Lendia	Lythraceae
<i>Lannea coromandelica</i>	Wodier Tree	Anacardiaceae
<i>Leucaena leucocephala</i>	White Popinac, Lead Tree	Fabaceae
<i>Madhuca indica</i>	Butter Tree, Mahua	Sapotaceae
<i>Madhuca longifolia</i>	South Indian Mahua, Mowra Butter Tree	Sapotaceae
<i>Mallotus philippensis</i>	Kum Kum Tree, Kamala Tree	Euphorbiaceae
<i>Mangifera indica</i>	Mango	Anacardiaceae
<i>Manilkara hexandra</i>	Khirni	Sapotaceae
<i>Miliusa tomentosa</i>		Annonaceae
<i>Mitragyna parvifolia</i>	Kaim	Rubiaceae
<i>Morinda tomentosa</i>		Rubiaceae
<i>Moringa oleifera</i>	Drumstick Tree	Moringaceae
<i>Naringi crenulata</i>		Rutaceae
<i>Oroxylum indicum</i>		Bignoniaceae
<i>Ougeinia cojeinensis</i>	Sandan	Fabaceae
<i>Parkinsonia aculeata</i>		Fabaceae
<i>Peltophorum pterocarpum</i>	Copper Pod, Rusty Shield Bearer	Fabaceae
<i>Phoenix sylvestris</i>	Wild Date Palm	Arecaceae
<i>Pithecellobium dulce</i>	Manila Tamarind	Fabaceae
<i>Prosopis cineraria</i>	Indian Mesquite	Fabaceae
<i>Prosopis juliflora</i>	Mesquite	Fabaceae
<i>Pterocarpus marsupium</i>	Indian Kino Tree, Malabar Kino Tree	Fabaceae
<i>Radermachera xylocarpa</i>	Padri Tree	Bignoniaceae
<i>Rhizophora mucronata</i>	True Mangrove	Rhizophoraceae
<i>Salvadora oleoides</i>	Toothbrush Tree	Salvadoraceae
<i>Salvadora persica</i>	Toothbrush Tree	Salvadoraceae
<i>Santalum album</i>	Sandalwood Tree	Santalaceae
<i>Sapindus emarginatus</i>	Soapnut Tree of South India	Sapindaceae
<i>Schleichera oleosa</i>	Lac Tree, Macassar Oil Tree, Ceylon Dak	Sapindaceae
<i>Schrebera swietenoides</i>	Weaver's-Beam Tree	Oleaceae
<i>Sonneratia apetala</i>		Sonneratiaceae

Scientific Name	English Name	Family
<i>Coymida febrifuga</i>	Indian Redwood	Meliaceae
<i>Spondias pinnata</i>	Wild Mango, Hog Plum	Anacardiaceae
<i>Sterculia urens</i>	Katira Gum Tree	Sterculiaceae
<i>Streblus asper</i>	Siamese Rough-Bush	Moraceae
<i>Syzygium cumini</i>	Jamun, Black Plum, Java Plum	Myrtaceae
<i>Tamarindus indica</i>	Tamarind Tree	Fabaceae
<i>Tecomanella undulata</i>	Rohida Tree	Bignoniaceae
<i>Tectona grandis</i>	Teak	Verbenaceae
<i>Terminalia alata</i>	Laurel	Combretaceae
<i>Terminalia arjuna</i>	Arjun	Combretaceae
<i>Terminalia bellirica</i>	Belliric Myrobalan	Combretaceae
<i>Terminalia chebula</i>	Chebulic Myrobalan	Combretaceae
<i>Terminalia crenulata</i>		Combretaceae
<i>Thespesia populnea</i>	Portia Tree	Malvaceae
<i>Trema orientalis</i>	Charcoal Tree, Indian Nettle Tree	Ulmaceae
<i>Wrightia tinctoria</i>	Wrightia	Apocynaceae
<i>Wrightia tomentosa</i>	Wrightia	Apocynaceae
<i>Xerorphis spinosa</i>	Common Emetic Nut	Rubiaceae
<i>Ziziphus mauritiana</i>	Indian Jujube	Rhamnaceae
<i>Ziziphus xylocarpus</i>		Rhamnaceae

Reference Sources for English and Family Names :

Saldanha and Nicolson 1976; Saldanha 1984; Council of Scientific and Industrial Research 1986; Venkatesh 1976

Appendix 5: PLANTS (OTHER THAN TREES) REPORTED FROM NATIONAL PARKS AND SANCTUARIES OF GUJARAT

Scientific Name (Vernacular Name)	Plant Type*	NBAN	NGIR	NMAR	NVEL	SBAR	SDHR	SHIN	SJES	SKHI	SNAL	SNAR	SRAT	SSHO
<i>Abrus precatorius</i> (Chanothi)	C						*							*
<i>Acacia pennata</i> (Chilaru)	S													*
<i>Acacia torta</i> (Chilar)	C	*												
<i>Achyranthes aspera</i> (Agethi, Zinnudo)	H													*
<i>Aegiceras corniculatum</i>	S			*										
<i>Agave americana</i> (Ketki)	S													*
<i>Ageratum conyzoides</i> (Moyu)	H													*
<i>Aloe barbadensis</i> (Kumar)	H			*										
<i>Amberboa</i> spp.	H				*									
<i>Aenorphophallus comutatus</i> (Jungli suran)	H													*
<i>Andropogon</i> spp.	H													
<i>Apluda mutica</i> (Bhangeru, Gargadi)	H						*							*
<i>Argemone mexicana</i> (Dagodi)	H													*
<i>Aristida adscensionis</i> (Lapedu)	H						*							
<i>Arundinella</i> spp.	H				*									
<i>Asparagus racemosus</i> (Safed musli, Shatavri)	H	*											*	
<i>Atriplex</i> spp.				*										
<i>Balanites aegyptiaca</i> (Hengol, Hingor, Hingori, Ingor, Ingoria)	S						*		*			*	*	*
<i>Bambusa arundinacea</i> (Katas vans, Katas, Vans)	S	*											*	*
<i>Barleria prionitis</i> (Kanta salia, Kantseriu)	S						*							*
<i>Bauhinia vahlii</i> (Avol)	C													*
<i>Boswellia</i> spp.				*										
<i>Bothriochloa intermedia</i> (Dhrapado)	H						*							
<i>Bougainvillea spectabilis</i> (Boganvel)	C										*			
<i>Brachiaria setigera</i> (Kanesu)	H			*										
<i>Butea superba</i> (Palasvel)	C	*												*
<i>Cadaba fruticosa</i> (Teliyo hemkand)	S			*										
<i>Calotropis gigantea</i> (Akdo, Moto akdo)	S			*										*
<i>Calotropis procera</i> (Aak, Akdo)	S			*										*
<i>Calycopteris flogibunda</i> (Ukshi)	S	*												
<i>Capparis decidua</i> (Kerdo, Kordo)	S						*	*	*			*		
<i>Capparis sepiaria</i> (Kanthar, Kantharo)	S							*				*		*
<i>Capparis</i> spp.				*										
<i>Capparis zeylanica</i> (Kanthar)	S													*
<i>Carissa opaca</i> (Karamdi)	S		*											
<i>Carissa congesta</i> (Karamda, Karandi, Karvand)	S	*									*			*
<i>Carvia callosa</i> (Karav, Karir, Karvi)	S	*										*	*	*
<i>Cassia auriculata</i> (Awal)	S	*						*				*	*	*
<i>Cassia tora</i> (Kumadio, Pavadio, Punwadio, Puvadiyo)	H		*				*					*	*	*
<i>Caulerpa peltata</i>	A			*										
<i>Caulerpa racemosa</i>	A			*										
<i>Celastrus paniculatus</i> (Malkakni, Malkankna)	C	*												*
<i>Champia</i> spp.	A			*										
<i>Chloris barbata</i> (Mindadiw)	H				*									
<i>Chloris</i> spp.	H				*									
<i>Chrysopogon fulvus</i> (Dheraf)	H		*											
<i>Cissampelos pageira</i> (Pahadvel)	C	*												
<i>Cissus repanda</i> (Gandovelo, Panival)	C	*												*
<i>Cleome viscosa</i> (Sambar singa)	H													*
<i>Clerodendrum multiflorum</i> (Arni)	S													*
<i>Cocculus hirsutus</i> (Asanvel)	H													*
<i>Combretum albidum</i> (Dhumas, Dhummas)	C	*												*
<i>Commiphora wightii</i> (Gugal, Gugar)	S			*			*				*			
<i>Corallina</i> spp.	A			*										
<i>Corchorus olitorius</i> (Moti chhunchh)	H				*									
<i>Cordia monoica</i> (Kathgundi, Koth gundi)	S						*				*			

Scientific Name (Vernacular Name)

Plant Type* NBAN NGIR NMAR NVEL SBAR SDHR SHIN SJES SKHI SNAL SNAR SRAT SSHO
SMAR

Costus speciosus (Pevta)
Cressa cretica (Una)
Cryptolepis buehnanii (Karanta)
Curcuma spp. (Jungli haldar)
Cuscuta reflexa (Amarvel)
Cymbopogon jwarancus (Gandharu)
Cymbopogon martinii (Roshia, roydu)
Cynodon dactylon (Dab darbh, Dhro)
Cyperus rotundus (Chido, Motha)
Cyperus spp.
Cystocera spp.
*Dactyloctenium aegyptium*³ (Makra)
Dendrocalamus strictus (Manvel vans, Manvel)
*Desmodium dichotomum*³ (Chikti)
*Dichanthium annulatum*³ (Zinzo, Zinzvo, Zinzao)
Dichrostachys cinerea (Madith, Velantaro, Vilatru)
Dictyota spp.
Digera sp.
Dioscorea sp.
*Echinochloa colonum*¹ (Pakud)
*Emphedra foliata*³
*Ensete superbum*³ (Jungli kela)
Enteromorpha intestinalis
*Eragrostis japonica*²
*Eragrostis unilgides*² (Chaki choka)
*Euphorbia hirta*² (Dudeli)
*Euphorbia nivulia*² (Thor)
Euphorbia spp.
Fimbristylis spp.
Gardenia turgida (Shamela)
Gelidiella spp.
Gracillaria corticata
Grewia hirsuta (Khad dhani)
*Grewia tenax*² (Gangeti)
Halimada spp.
Halophila beccarii
Halophila ovalis
Helecteres isora (Ategi, Atai, Mardhasing, Marodsing)
Heteropogon contortus (Dabhe, Kusal, Sukli)
Hibiscus cannabinus (Khati bhindi)
Hibiscus sp.
Hibiscus vitifolius (Ranbhindi)
Hypireia muscifonis
Indigofera cordifolia (Dadio)
Indigofera linifolia (Relhus, Zil)
Indigofera spp.
*Ipomoea pes-caprae*² (Arvel)
*Iseilema prostratum*² (Mosti)
Iyengariya spp.
*Lantana camara*² (Achhi chunadi, Dhanidaria)
Laurencia spp.
*Leea macrophylla*² (Dini)
Leucas biflora (Doyalu)
Maytenus emarginata (Vico, Vikro)
Maytenus spinosa (Rekli)
Millettia racemosa (Velabivda)
Moghania strobilifera (Madhuri)

Plant Type	NBAN	NGIR	NMAR	NVEL	SBAR	SDHR	SHIN	SJES	SKHI	SNAL	SNAR	SRAT	SSHO	SMAR
H	*													
H				*										
C	*													
H													*	
C						*								
H					*									
H													*	
H				*									*	
H				*									*	
A			*			*								
H			*											
S	*	*						*				*	*	
H													*	
H		*		*	*									
S								*			*		*	
A			*											
H	*			*										
C				*										
H				*										
S			*											
H			*										*	
A			*											
H			*											
C	*			*										
H				*										
S			*											
H			*											
A			*											
H			*											
H			*										*	
H			*	*	*	*								
H			*											
S			*										*	
A			*											
A			*											
S													*	
S										*				
A			*											
H			*											
H			*											
S	*	*				*		*			*	*		
H	*					*						*		
S												*		
S			*										*	
A			*										*	
A			*										*	
H			*										*	
S			*								*	*		
S			*								*	*		
C	*												*	
H													*	

Moringa spp.					*
Mucuna pruriens ² (Kuvach, Kavach)	C				*
Neuracanthus sphaerostachyus (Ganthera)	S	*			
Nyctanthes arbor-tristis (Sadi, Shiyali)	S				*
Ocimum americanum ² (Jungli tulso)	H				*
Orobanchae spp.	H		*		
Padina tetraströmatica	A		*		
Pedaliū murale (Gokhru)	S				*
Phoenix acaulis (Hinjedū)	S				*
Phyllanthus maderaspatensis (Kanocha)	H		*		
Portulaca spp.			*		
Premna obtusifolia ² (Kundher)	S				*
Pueraria tuberosa (Bhoikoru, Fagual)	C			*	
Randia spp. (Gogdu)	H				*
Raphanus sativus (Megri)	H				*
Salicornia brachiata	S		*		
Sargassum illicifolium	A		*		
Sargassum swartzii	A		*		
Sargassum tennerimū	A		*		
Sehima sulcatum ¹ (San, Soniyar)	H	*		*	
Sesbania bispinosa ² (Sasi ikad)	S		*		
Solanum spp.		*			
Sorghum halepense ¹ (Baru, Basu)	H			*	*
Spathoglōsum spp.	A		*		
Spatholobus parviflorus ³ (Phalsan)	S	*			
Sporobolus maderaspatanus (Usar ghas)	H		*		
Sporobolus spp. ²	H			*	
Striga asiatica ² (Agia)	H			*	
Suaeda fruticosa (Luno)	S		*		
Suaeda maritima (Moras)	H			*	
Suaeda spp.				*	
Tamarix dioica (Achi)	S		*		*
Tamarix ericoides (Kharhando)	S				*
Tamarix spp.				*	
Tephrosia purpurea (Sarpankho)	S	*			
Themeda quadrivalvis ² (Bhatado, Bhatdu)	H	*			*
Themeda sp.				*	
Thespesia lampas ¹ (Jungli bhindi)	S				*
Tinospora cordifolia (Garō)	C				*
Triumfetta spp. (Zipto)	H				*
Ulva fasciata	A		*		
Ulva lactuca	A		*		
Ulva reticulata	A		*		
Urena lobata ² (Jungli kapas)	S				*
Ventilago denticulata ² (Kangvel)	C				*
Vernonia cinerea (Sadori)	H		*		
Vigna aconitifolia ³ (Mut)	H		*		
Vitex negundo (Nagod)	S				*
Wagatea spicata (Vakgri)	C	*			
Woodfordia fruticosa ² (Dayanti, Jini dhamni, Vedchi)	S	*			*
Xeromphis spinosa ³ (Mindhol)	S				*
Xeromphis spp.		*			
Xeromphis uliginosa ¹ (Congadi, Gol, Gongad)	S			*	*
Ziziphus nummularia ¹ (Boyadi, Chanibor, Chenibor, Palera)	S	*		*	*
Ziziphus oenoplia (Kanthar)	C			*	*
Ziziphus rugosa (Toranvel)	C				*
Ziziphus spp.		*			
Zostera marina	H		*		

* S = Shrub H = Herb C = Climber A = Algae

The above list of other plants has been compiled from the following sources (for full references please see individual directory sheets and 'References and Bibliography') :

NBAN - 01, Scheme
 NGIR - 01, BRO, Chavan-b, Chavan-c, Berwick, Rashid, Sinha
 NMAR - 01, BRO/MAR 3, Parmar, Anon, FV
 NVEL - 01
 SBAR - 01
 SDHR - 01, MP, FV
 SHIN - 01

SJES - 01
 SKHI - 01
 SNAL - 01
 SNAR - 01
 SRAT - 01, WP
 SSHO - 01

KEY

Species whose :

- 1 : Generic name has changed (see List 1)
- 2 : Specific name has changed (see List 2)
- 3 : Generic and specific names have changed (see List 3)
- 4 : Genus is now obsolete and split into several genera

why undated? why undated?

CURRENT NAME

OBSOLETE NAME

LIST 1

Cissus repanda
 Echinochloa colonum
 Heteropogon contortus
 Maytenus spinosa
 Sehima sulcatum

Vitis repanda
 Andropogon contortus
 Panicum colonum
 Gymnosporia spinosa
 Ischaemum sulcatum

CURRENT NAME

OBSOLETE NAME

Sorghum halepense
 Thespesia lampas
 Xerophis uliginosa
 Ziziphus nummularia

Andropogon halepense
 Azana lampas
 Randia uliginosa
 Rhamnus nummularia

LIST 2

Acacia torta
 Aristida adscensionis
 Balanites aegyptica
 Cadaba fruticosa
 Capparis decidua
 Capparis zeylanica
 Cocculus hirsutus
 Combretum albidum
 Commiphora wightii
 Desmodium dichotomum
 Eragrostis japonica
 Eragrostis uniloides
 Euphorbia hirta
 Euphorbia nivulia

Acacia caesia
 Aristida depressa
 Balanites roxburghii
 Cadaba indica
 Capparis aphylla
 Capparis horrida
 Cocculus villosus
 Combretum latifolium
 Commiphora mukul
 Desmodium diffusum
 Eragrostis diarrhena
 Eragrostis amabilis
 Euphorbia pilulifera
 Euphorbia neriifolia

Brewia tenax
 Ipomoea pes-caprae
 Iseilema prostratum
 Lantana camara
 Leea macrophylla
 Mucuna pruriens
 Ocimum americanum
 Premna obtusifolia
 Sesbania bispinosa
 Striga asiatica
 Themeda quadrivalvis
 Urena lobata
 Ventilago denticulata
 Woodfordia fruticosa

Brewia betulaefolia
 Ipomoea biloba
 Iseilema wightii
 Lantana aculeata
 Leea aspera
 Mucuna prurita
 Ocimum canum
 Premna integrifolia
 Sesbania aculeata
 Striga lutea
 Themeda ciliata
 Urena sinuata
 Ventilago calyculata
 Woodfordia floribunda

LIST 3

Carvia callosa
 Chrysopogon fulvus
 Dactyloctenium aegyptium
 Dichanthium annulatum
 Ensete superbum

Strobilanthes callosus
 Andropogon monticola
 Eleusine aegyptiaca
 Andropogon annulatus
 Musa superba

Maytenus emarginata
 Spatholobus parviflorus
 Vigna aconitifolia
 Xerophis spinosa

Celastrus emarginatus
 Butea parviflora
 Phaseolus aconitifolius
 Randia dumetorum or
 Randia brandisii

Reference Sources for Name Changes : Chandra and Gaur 1988;
 Saldanha and Nicolson 1976; Saldanha 1984; Council of Scientific and Industrial Research 1986

APPENDIX 6

SCIENTIFIC, ENGLISH, AND FAMILY NAMES OF PLANTS LISTED IN APPENDIX 5

Scientific Name	Common/English Name	Family
<i>Abrus precatorius</i>	Indian Liquorice	Fabaceae
<i>Acacia pennata</i>	Rusty Mimosa	Fabaceae
<i>Acacia torta</i>	Black Catechu	Fabaceae
<i>Achyranthes aspera</i>	Prickly Chaff Flower	Amaranthaceae
<i>Aegiceras corniculatum</i>		Myrsinaceae
<i>Agave americana</i>	Century Plant	Agavaceae
<i>Ageratum conyzoides</i>	Goat Weed	Asteraceae
<i>Aloe barbadensis</i>	Indian Aloe	Liliaceae
<i>Amberboa</i> spp.		Asteraceae
<i>Amorphophallus conutatus</i>		Araceae
<i>Andropogon</i> spp.		Poaceae
<i>Apluda mutica</i>		Poaceae
<i>Argemone mexicana</i>	Prickly Poppy	Papaveraceae
<i>Aristida adscensionis</i>		Poaceae
<i>Arundinella</i> spp.		Poaceae
<i>Asparagus racemosus</i>		Asparagaceae
<i>Atriplex</i> spp.		Chenopodiaceae
<i>Balanites aegyptiaca</i>		Balanitaceae
<i>Bambusa arundinacea</i>	Thorny Bamboo	Poaceae
<i>Barleria prionitis</i>		Acanthaceae
<i>Bauhinia vahlii</i>	Vahl's Bauhinia	Fabaceae
<i>Boswellia</i> spp.		Burseraceae
<i>Bothriochloa intermedia</i>		Poaceae
<i>Bougainvillea spectabilis</i>	Bougainvillea	Nyctaginaceae
<i>Brachiaria setigera</i>		Poaceae
<i>Butea superba</i>		Fabaceae
<i>Cadaba fruticosa</i>		Capparaceae
<i>Calotropis gigantea</i>		Asclepiadaceae
<i>Calotropis procera</i>		Asclepiadaceae
<i>Calycopteris floribunda</i>		Combretaceae
<i>Capparis decidua</i>	Caper Tree	Capparaceae
<i>Capparis sepiaria</i>		Capparaceae
<i>Capparis</i> spp.		Capparaceae
<i>Capparis zeylanica</i>		Capparaceae
<i>Carissa opaca</i>		Apocynaceae
<i>Carissa congesta</i>		Apocynaceae
<i>Carvia callosa</i>		Acanthaceae
<i>Cassia auriculata</i>	Eared Senna	Fabaceae
<i>Cassia tora</i>	Foetid Cassia	Fabaceae
<i>Caulerpa peltata</i>		Caulerpaceae
<i>Caulerpa racemosa</i>		Caulerpaceae
<i>Celastrus paniculatus</i>		Celastraceae
<i>Champia</i> spp.		
<i>Chloris barbata</i>		Poaceae
<i>Chloris</i> spp.		Poaceae
<i>Chrysopogon fulvus</i>		Poaceae
<i>Cissampelos pareira</i>	False Pareira Brava	Menispermaceae
<i>Cissus repanda</i>		Vitaceae
<i>Cleome viscosa</i>		Cleomaceae
<i>Clerodendrum multiflorum</i>		Verbenaceae
<i>Cocculus hirsutus</i>	Ink Berry	Menispermaceae
<i>Combretum albidum</i>		Combretaceae
<i>Commiphora wightii</i>		Burseraceae
<i>Corallina</i> spp.		
<i>Corchorus olitorius</i>		Tiliaceae
<i>Cordia monoica</i>		Boraginaceae

Scientific Name	English Name	Family
<i>Costus speciosus</i>		Costaceae
<i>Oreocarya cretica</i>		Convolvulaceae
<i>Cryptolepis buchananii</i>		Periplocaceae
<i>Curcuma</i> spp.		Zingiberaceae
<i>Cuscuta reflexa</i>		Convolvulaceae
<i>Cymbopogon jwarancus</i>		Poaceae
<i>Cymbopogon martinii</i>	Rusa Grass	Poaceae
<i>Cynodon dactylon</i>	Dhub Grass, Bermuda Grass	Poaceae
<i>Cyperus rotundus</i>	Nut Grass	Cyperaceae
<i>Cyperus</i> spp.		Cyperaceae
<i>Cystocera</i> spp.		
<i>Dactyloctenium aegyptium</i>		Poaceae
<i>Dendrocalamus strictus</i>	Male Bamboo, Solid Bamboo	Poaceae
<i>Desmodium dichotomum</i>		Fabaceae
<i>Dichanthium annulatum</i>		Poaceae
<i>Dichrostachys cinerea</i>		Fabaceae
<i>Dictyota</i> spp.		
<i>Digera</i> sp.		Amaranthaceae
<i>Dioscorea</i> sp.		Dioscoreaceae
<i>Echinochloa colonum</i>		Poaceae
<i>Emphedra foliata</i>		
<i>Ensete superbum</i>		Musaceae
<i>Enteromorpha intestinalis</i>		Ulvaceae
<i>Eragrostis japonica</i>		Poaceae
<i>Eragrostis uniloides</i>		Poaceae
<i>Euphorbia hirta</i>		Euphorbiaceae
<i>Euphorbia nivulia</i>		Euphorbiaceae
<i>Euphorbia</i> spp.		Euphorbiaceae
<i>Fimbristylis</i> spp.		Cyperaceae
<i>Gardenia turgida</i>		Rubiaceae
<i>Gelidiella</i> spp.		Gelidiellaceae
<i>Gracillaria corticata</i>		Gracilariaceae
<i>Grewia hirsuta</i>		Tiliaceae
<i>Grewia tenax</i>		Tiliaceae
<i>Halimada</i> spp.		
<i>Halophila beccarii</i>		Hydrocharitaceae
<i>Halophila ovalis</i>		Hydrocharitaceae
<i>Helicteres isora</i>	East Indian Screw Tree	Sterculiaceae
<i>Heteropogon contortus</i>	Spear Grass	Poaceae
<i>Hibiscus cannabinus</i>	Deccan Hemp	Malvaceae
<i>Hibiscus</i> sp.		Malvaceae
<i>Hibiscus vitifolius</i>		Malvaceae
<i>Hypocrepia muscifrons</i>		
<i>Indigofera cordifolia</i>		Fabaceae
<i>Indigofera linifolia</i>		Fabaceae
<i>Indigofera</i> spp.		Fabaceae
<i>Ipomoea pes-caprae</i>		Convolvulaceae
<i>Iseilema prostratum</i>		Poaceae
<i>Iyengaraya</i> spp.		
<i>Lantana camara</i>	Lantana, Wild Sage	Verbenaceae
<i>Laurencia</i> spp.		Rhododendraceae
<i>Leea macrophylla</i>		Leeaceae
<i>Leucas biflora</i>		Lamiaceae
<i>Maytenus emarginata</i>		Celastraceae
<i>Maytenus spinosa</i>		Celastraceae
<i>Millettia racemosa</i>		Fabaceae
<i>Moghania strobilifera</i>		Fabaceae
<i>Moringa</i> spp.		Moringaceae
<i>Mucuna pruriens</i>	Common Cowitch	Fabaceae
<i>Neuracanthus sphaerostachyus</i>		Acanthaceae
<i>Nyctanthes arbor-tristis</i>	Night Jasmine	Oleaceae

Scientific Name	English Name	Family
<i>Ocimum americanum</i>	Hoary Basil	Lamiaceae
<i>Orobanche</i> spp.		Orobanchaceae
<i>Padina tetraströmatica</i>		
<i>Pedaliū murale</i>		Pedaliaceae
<i>Phoenix acaulis</i>		Arecaceae
<i>Phyllanthus maderaspatensis</i>		Euphorbiaceae
<i>Portulaca</i> spp.		Portulacaceae
<i>Premna obtusifolia</i>		Verbenaceae
<i>Pueraria tuberosa</i>	Indian Kudzu	Fabaceae
<i>Randia</i> spp.		Rubiaceae
<i>Raphanus sativus</i>	Radish	Brassicaceae
<i>Salicornia brachiata</i>		Chenopodiaceae
<i>Sargassum illicifolium</i>		Sargassaceae
<i>Sargassum swartzii</i>		Sargassaceae
<i>Sargassum tennerinum</i>		Sargassaceae
<i>Sehima sulcatum</i>		Poaceae
<i>Sesbania bispinosa</i>		Fabaceae
<i>Solanum</i> spp.		Solanaceae
<i>Sorghum halepense</i>	Johnson Grass	Poaceae
<i>Spathoglōsum</i> spp.		
<i>Spatholobus parviflorus</i>		Fabaceae
<i>Sporobolus maderaspatanus</i>		Poaceae
<i>Sporobolus</i> spp.		Poaceae
<i>Striga asiatica</i>		Scrophulariaceae
<i>Suaeda fruticosa</i>	Seablite	Chenopodiaceae
<i>Suaeda maritima</i>	Common Indian Saltwort	Chenopodiaceae
<i>Suaeda</i> spp.		Chenopodiaceae
<i>Tamarix dioica</i>		Tamaricaceae
<i>Tamarix ericoides</i>		Tamaricaceae
<i>Tamarix</i> spp.		Tamaricaceae
<i>Tephrosia purpurea</i>	Wild Indigo	Fabaceae
<i>Themeda quadrivalvis</i>	Kangaroo Grass	Poaceae
<i>Themeda</i> sp.		Poaceae
<i>Thespesia lampas</i>		Malvaceae
<i>Tinospora cordifolia</i>	Gulanha Tinospora	Menispermaceae
<i>Triumfetta</i> spp.		Tiliaceae
<i>Ulva fasciata</i>		Ulvaceae
<i>Ulva lactuca</i>		Ulvaceae
<i>Ulva reticulata</i>		Ulvaceae
<i>Urena lobata</i>		Malvaceae
<i>Ventilago denticulata</i>		Rhamnaceae
<i>Vernonia cinerea</i>	Purple Fleabane, Ash-coloured Fleabane	Asteraceae
<i>Vigna aconitifolia</i>	Aconite Bean, Moth Bean	Fabaceae
<i>Vitex negundo</i>		Verbenaceae
<i>Wagatea spicata</i>		Caesalpiniaceae
<i>Woodfordia fruticosa</i>	Fire-flame Bush	Lythraceae
<i>Xeromphis spinosa</i>	Common Emetic Nut	Rubiaceae
<i>Xeromphis</i> spp.		Rubiaceae
<i>Xeromphis uliginosa</i>		Rubiaceae
<i>Ziziphus nummularia</i>	Wild Jujube	Rhamnaceae
<i>Ziziphus oenoplia</i>	Jackal Jujube	Rhamnaceae
<i>Ziziphus rugosa</i>		Rhamnaceae
<i>Ziziphus</i> spp.		Rhamnaceae
<i>Zostera marina</i>		

Reference Sources for English and Family Names :

Saldanha and Nicolson 1976; Saldanha 1984; Council of Scientific and Industrial Research 1986; Venkatesh 1976

Appendix 7: BIRDS REPORTED FROM NATIONAL PARKS AND SANCTUARIES OF GUJARAT ¹

COMMON NAME	LATIN NAME	NBAN	NGIR	NMAR	NVEL	SBAR	SDHR	SHIN	SJES	SKHI	SNAL	SNAR	SRAT	SSHO
				SNAR										
Avocet	<i>Recurvirostra avosetta</i>			*	*			*				*		
Babbler, Common	<i>Turdoides caudatus</i>		*		*		*					*		*
Babbler, Jungle	<i>Turdoides striatus</i>		*										*	*
Babbler, Large Grey	<i>Turdoides malcolmi</i>		*											*
Babbler, Rufousbellied	<i>Dumetia hypertythra</i>		*											
Babbler, Slatyheaded Scimitar	<i>Pomatorhinus horsfieldii</i>		*											
Babbler, Yelloweyed	<i>Chrysomma sinense</i>		*											
Barbet, Crimsonbreasted	<i>Megalaima haemacephala</i>	*	*										*	*
Barbet, Green	<i>Megalaima zeylanica</i>													*
Baya	<i>Ploceus philippinus</i>		*		*							*		
Baya, Finn's	<i>Ploceus megarhynchus</i>				*									
Bee-eater, Bluecheeked	<i>Merops superciliosus</i>		*		*							*		*
Bee-eater, Bluetailed	<i>Merops philippinus</i>				*									
Bee-eater, Green	<i>Merops orientalis</i>	*	*	*	*		*					*		*
Blackbird	<i>Turdus merula</i>		*											
Bluethroat	<i>Erithacus svecicus</i>		*											
Bulbul, Redvented	<i>Pycnonotus cafer</i>		*		*		*					*		*
Bulbul, Whitebrowed	<i>Pycnonotus luteolus</i>													*
Bulbul, Whitecheeked	<i>Pycnonotus leucogenys</i>			*	*		*					*		*
Bunting, Blackheaded	<i>Emberiza melanocephala</i>		*									*		
Bunting, Crested	<i>Melophus lathami</i>		*											
Bunting, Greynecked	<i>Emberiza buehanani</i>		*									*		
Bunting, Redheaded	<i>Emberiza bruniceps</i>		*											
Bunting, Striolated	<i>Emberiza striolata</i>		*											
Bustard, Great	<i>Otis tarda</i>												*	
Bustard, Great Indian	<i>Choriotis nigriceps</i>						*					*		
Bustard-quail, Common	<i>Turnix suscitator</i>											*		
Bustard-quail, Little	<i>Turnix sylvatica</i>		*											
Buzzard	<i>Buteo buteo</i>							*						
Buzzard, Honey	<i>Pernis ptilorhynchus</i>		*		*			*						
Buzzard, Longlegged	<i>Buteo rufinus</i>		*											
Buzzard-eagle, White-eyed	<i>Butastur teesa</i>		*									*		
Chat, Blue	<i>Erithacus brunneus</i>		*											
Chat, Brown Rock	<i>Cercomela fusca</i>											*		
Chat, Isabelline	<i>Oenanthe isabellina</i>		*		*									
Chat, Pied	<i>Oenanthe picata</i>		*	*	*									
Chat, Pied Bush	<i>Saxicola caprata</i>		*											
Chat, Redtailed	<i>Oenanthe xanthopyrma</i>		*									*		
Chat, Rufous	<i>Erythropygia galactotes</i>		*									*		
Chat, Stone	<i>Saxicola torquata</i>		*		*									*
Chloropsis, Goldfronted	<i>Chloropsis aurifrons</i>													*
Cock, Water	<i>Gallicrex cinerea</i>		*								*			
Coot	<i>Fulica atra</i>		*		*		*			*	*	*		
Cormorant	<i>Phalacrocorax carbo</i>			*										
Cormorant, Little	<i>Phalacrocorax niger</i>		*				*				*	*		*
Courser, Creamcoloured	<i>Cursorius cursor</i>						*					*		
Courser, Indian	<i>Cursorius coromandelicus</i>				*							*		
Crake, Baillon's	<i>Porzana pusilla</i>		*											
Crake, Brown	<i>Amaurornis akool</i>		*											
Crane, Common	<i>Grus grus</i>				*			*				*		
Crane, Demoiselle	<i>Anthropoides virgo</i>		*		*		*	*			*	*		
Crane, Sarus	<i>Gurus antigone</i>		*		*		*				*			
Crane, Siberian	<i>Grus leucogeranus</i>						*							
Crow, House	<i>Corvus splendens</i>	*	*	*	*			*				*		*
Crow, Jungle	<i>Corvus macrorhynchus</i>	*	*											*
Crow-pheasant	<i>Centropus sinensis</i>	*	*		*		*					*	*	*
Cuckoo, Pied Crested	<i>Clamator jacobinus</i>		*					*						

COMMON NAME	LATIN NAME	NBAN	NGIR	NMAR	NVEL	SBAR	SDHR	SHIN	SJES	SKHI	SNAL	SNAR	SRAT	SSHO
		SMAR												
Cuckoo, Sirkeer	Taccocua leschenaultii	*												
Cuckoo, The	Cuculus canorus	*												
Cuckoo-shrike, Blackheaded	Coracina melanoptera	*											2	2
Cuckoo-shrike, Large	Coracina novaehollandiae	*											2	2
Curlew	Numenius arquata			*	*						*	*		
Curlew, Stone	Burhinus oedicnemus	*			*		*					*		
Darter	Anhinga rufa	*	*				*				*			
Dove, Emerald	Chalcophaps indica	*											*	
Dove, Indian Ring	Streptopelia decaocto	*	*		*		*				*			
Dove, Little Brown	Streptopelia senegalensis	*	*		*		*				*	*	*	
Dove, Red Turtle	Streptopelia tranquebarica	*											*	
Dove, Rufous Turtle	Streptopelia orientalis	*					*							
Dove, Spotted	Streptopelia chinensis	*		*			*							*
Dove, Turtle	Streptopelia turtur			*										
Drongo, Ashy	Dicrurus leucophaeus	*												
Drongo, Black	Dicrurus adsimilis	*	*		*		*	*				*		*
Drongo, Lesser Racket-tailed	Dicrurus remifer	*											*	*
Drongo, Whitebellied	Dicrurus caerulescens	*	*				*						*	*
Duck, Comb	Sarkidiornis melanotos	*									*			
Duck, Spotbill	Anas poecilorhyncha	*		*			*				*	*		
Duck, Tufted	Aythya fuligula										*			
Dunlin	Calidris alpina											*		
Eagle, Bonelli's	Hieraaetus fasciatus	*										*		
Eagle, Crested Serpent	Spilornis cheela	*	*				*							*
Eagle, Greater Spotted	Aquila clanga				3									
Eagle, Imperial	Aquila heliaca				3									
Eagle, Lesser Spotted	Aquila pomarina				3									
Eagle, Pallas's Fishing	Haliaeetus leucoryphus	*					*				*			
Eagle, Short-toed	Circaetus gallicus	*		*			*							
Eagle, Tawny	Aquila rapax			*		*	*					*		
Eagle, Whitebellied Sea	Haliaeetus leucogaster						*							
Egret, Cattle	Bubulcus ibis	*	*	*	*		*	*			*	*		*
Egret, Large	Ardea alba	*	*	*	*					*		*		
Egret, Little	Egretta garzetta	*	*	*	*		*				*	*		*
Egret, Smaller	Egretta intermedia	*		*							*	*		
Falcon, Lanner	Falco biarmicus	*										*		
Falcon, Peregrine	Falco peregrinus	*		*										
Finch-lark, Ashycrowned	Eremopterix grisea	*		*								*		
Finch-lark, Blackcrowned	Eremopterix nigriceps			*										
Finch-lark, Rufoustailed	Ammodramus phoenicurus	*		*										
Flamingo	Phoenicopterus roseus		*			*			*	*	*	*		
Flamingo, Lesser	Phoeniconaias minor		*						*		*	*		
Florican, Lesser	Sypheotides indica	*		*								*		
Flowerpecker, Thickbilled	Dicaeum agile	*												*
Flowerpecker, Tickell's	Dicaeum erythrorhynchos	*												*
Flycatcher, Blacknaped	Hypothymis azurea	*												*
Flycatcher, Brown	Muscicapa latirostris	*												*
Flycatcher, Greyheaded	Culicicapa ceylonensis	*												*
Flycatcher, Paradise	Terpsiphone paradisi	*	*											*
Flycatcher, Redbreasted	Muscicapa parva	*		*								*		
Flycatcher, Rufoustailed	Muscicapa ruficauda	*												
Flycatcher, Spotted	Muscicapa striata	*									*			
Flycatcher, Tickell's Blue	Muscicapa tickelliae	*												*
Flycatcher, Verditer	Muscicapa thalassina	*												*
Flycatcher, Whitebrowed	Rhipidura aureola	*												
Faintail														
Flycatcher, Whitethroated	Rhipidura albicollis													*
Faintail														
Gadwall	Anas strepera										*			
Garganey	Anas querquedula										*			
Godwit, Bartailed	Limosa lapponica		*									*		

COMMON NAME	LATIN NAME	NBAN	NGIR	NMAR	NVEL	SBAR	SDHR	SHIN	SJES	SKHI	SNAL	SNAR	SRAT	SSHO
				SMAR										
Godwit, Blacktailed	<i>Limosa limosa</i>				*							*		
Goose, Barheaded	<i>Anser indicus</i>					*					*			
Goose, Grey Lag	<i>Anser anser</i>												*	
Goshawk	<i>Accipiter gentilis</i>	*												
Grebe, Great Crested	<i>Podiceps cristatus</i>									*				
Grebe, Little	<i>Podiceps ruficollis</i>	*				*				*	*	*		
Greenshank	<i>Tringa nebularia</i>	*	*	*									*	
Greenshank, Spotted	<i>Tringa guttifer</i>												*	
Grosbeak, Whitewing	<i>Coccothraustes carnipes</i>				*									
Gull, Blackheaded	<i>Larus ridibundus</i>		*										*	
Gull, Brownheaded	<i>Larus brunnicephalus</i>		*											
Gull, Great Blackheaded	<i>Larus ichthyaetus</i>		*											
Gull, Herring	<i>Larus argentatus</i>		*											
Gull, Slenderbilled	<i>Larus genei</i>		*											
Harrier, Marsh	<i>Circus aeruginosus</i>	*	*	*					*				*	
Harrier, Montagu's	<i>Circus pygargus</i>	*		*										
Harrier, Pale	<i>Circus macrourus</i>	*	*	*									*	*
Hawk-cuckoo, Common	<i>Cuculus varius</i>	*						*						
Hawk-eagle, Booted	<i>Hieraaetus pennatus</i>	*												
Hawk-eagle, Crested	<i>Spizaetus cirrhatus</i>	*												
Hen-harrier	<i>Circus cyaneus</i>			*										
Heron, Grey	<i>Ardea cinerea</i>	*	*	*		*	*			*	*	*		
Heron, Indian Reef	<i>Egretta gularis</i>	*	*	*						*	*	*		
Heron, Little Green	<i>Ardeola striatus</i>	*	*								*			
Heron, Night	<i>Nycticorax nycticorax</i>	*	*	*				*			*	*		
Heron, Pond	<i>Ardeola grayii</i>	*	*	*	*		*	*			*	*		*
Heron, Purple	<i>Ardea purpurea</i>	*								*				
Hobby	<i>Falco subbuteo</i>	*										*		
Hoopoe	<i>Upupa epops</i>	*		*		*						*		*
Hornbill, Common Grey	<i>Tockus birostris</i>	*												*
Houbara	<i>Chlamydotis undulata</i>											*		
Ibis, Black	<i>Pseudibis papillosa</i>	*	*		*		*	*			*	*		
Ibis, White	<i>Threskiornis aethiopica</i>	*	*	*		*	*				*	*		
Iora, Common	<i>Aegithina tiphia</i>	*												*
Iora, Marshall's	<i>Aegithina nigrolutea</i>	*										*		
Jacana, Bronzewinged	<i>Metopidius indicus</i>										*			
Jacana, Pheasant-tailed	<i>Hydrophasianus chirurgus</i>	*									*			
Junglefowl, Grey	<i>Gallus sonneratii</i>	*												*
Kestrel	<i>Falco tinnunculus</i>	*	*			*	*					*	*	
Kingfisher, Common	<i>Alcedo atthis</i>	*	*				*					*		*
Kingfisher, Lesser Pied	<i>Ceryle rudis</i>	*					*					*		*
Kingfisher, Whitebreasted	<i>Halcyon smyrnensis</i>	*	*	*	*		*	*				*		*
Kite, Blackwinged	<i>Elanus caeruleus</i>	*	*		*		*							
Kite, Brahminy	<i>Haliastur indus</i>	*	*			*	*			*				
Kite, Pariah	<i>Milvus migrans</i>	*		*			*					*		*
Knot, Eastern	<i>Calidris tenuirostris</i>		*											
Koel	<i>Eudynamis scolopacea</i>	*					*					*		*
Lapwing, Redwattled	<i>Vanellus indicus</i>	*	*	*			*					*		*
Lapwing, Sociable	<i>Vanellus gregarius</i>											*		
Lapwing, Yellow wattled	<i>Vanellus malabaricus</i>	*		*		*						*		
Lark, Crested	<i>Galerida cristata</i>			*		*						*		
Lark, Large Desert	<i>Alaemon alaudipes</i>					*						*		
Lark, Malabar Crested	<i>Galerida malabarica</i>			*										
Lark, Redwinged Bush	<i>Mirafra erythroptera</i>	*										*		
Lark, Short-toed	<i>Calandrella cinerea</i>	*		*										
Lark, Singing Bush	<i>Mirafra javanica</i>	*												
Lark, Sykes's Crested	<i>Galerida deva</i>	*										*		
Magpie-robin	<i>Copsychus saularis</i>	*	*										*	*
Mallard	<i>Anas platyrhynchos</i>										*			
Martin, Collared Sand	<i>Riparia riparia</i>	*												
Martin, Crag	<i>Hirundo rupestris</i>	*												

		SMAR									
Martin, Dusky Crag	Hirundo concolor	*								*	
Martin, Plain Sand	Riparia paludicola	*									
Merlin, Redheaded	Falco chicquera	*	*		*						
Minivet, Small	Pericrocotus cinnamomeus	*									*
Minivet, Whitebellied	Pericrocotus erythropygius	*								*	
Moorhen	Gallinula chloropus	*		*		*			*		
Moorhen, Purple	Porphyrio porphyrio	*							*		
Munia, Spotted	Lonchura punctulata	*									
Munia, Whitethroated	Lonchura malabarica	*		*						*	
Myna, Bank	Acridotheres gingipianus			*			*			*	
Myna, Brahminy	Sturnus pagodarum	*								*	
Myna, Common	Acridotheres tristis	*	*	*	*		*			*	*
Myna, Jungle	Acridotheres fuscus	*									
Nightjar, Common Indian	Caprimulgus asiaticus	*					*				*
Nightjar, Franklin's	Caprimulgus affinis	*								*	
Nightjar, Indian Jungle	Caprimulgus indicus	*									
Nuthatch, Chestnutbellied	Sitta castanea										*
Nuthatch, Velvetfronted	Sitta frontalis										*
Oriole, Blackheaded	Oriolus xanthornus	*	*				*				*
Oriole, Golden	Oriolus oriolus	*	*				*				
Osprey	Pandion haliaetus	*	*								
Owl, Barn	Tyto alba	*		*							
Owl, Brown Fish	Bubo zeylonensis	*									
Owl, Collared Scops	Otus bakkamoena	*									
Owl, Dusky Horned	Bubo coronandus				*						
Owl, Great Horned or Eagle-owl	Bubo bubo	*					*				*
Owl, Mottled Wood	Strix ocellata	*									
Owl, Shorteared	Asio flammeus	*									
Owlet, Jungle	Glaucidium radiatum	*									*
Owlet, Spotted	Athene brama	*		*		*	*			*	*
Oystercatcher	Haematopus ostralegus			*			*				
Parakeet, Alexandrine	Psittacula eupatria										*
Parakeet, Blossomheaded	Psittacula cyanocephala	*					*				*
Parakeet, Roseringed	Psittacula krameri	*	*	*	*		*			*	*
Partridge, Black	Francolinus francolinus									*	
Partridge, Grey	Francolinus pondicerianus	*	*	*	*		*	*		*	*
Partridge, Painted	Francolinus pictus	*	*				*				
Pastor, Rosy	Sturnus roseus	*	*	*	*		*			*	
Peafowl, Common	Pavo cristatus	*	*		*		*	*		*	
Pelican, Rosy	Pelecanus onocrotalus			*					4	*	
Pelican, Spottedbilled	Pelecanus philippensis			*					4	*	
Pigeon, Blue Rock	Columba livia	*	*	*	*		*	*		*	*
Pigeon, Green	Treron phoenicoptera	*	*								
Pintail	Anas acuta					*			*	*	
Pipit, Brown Rock	Anthus similis	*	*	*						*	
Pipit, Paddyfield	Anthus novaeseelandiae	*									
Pipit, Tawny	Anthus campestris	*								*	
Pipit, Tree	Anthus trivialis	*									
Pitta, Indian	Pitta brachyura	*									
Plover, Crab	Dromas ardeola			*							
Plover, Eastern Golden	Pluvialis dominica						*				
Plover, Great Stone	Esacus magirostris	*	*							*	
Plover, Grey Or Blackbellied	Pluvialis squatarola			*			*				
Plover, Kentish	Charadrius alexandrinus			*							
Plover, Large Sand	Charadrius leschenaultii			*						*	
Plover, Lesser Sand	Charadrius mongolus			*						*	
Plover, Little Ringed	Charadrius dubius			*	*				*		
Plover, Ringed	Charadrius hiaticula	*					*				
Plover, Sand	Charadrius asiaticus			*							
Pochard, Common	Aythya ferina									*	
Pochard, Redcrested	Netta rufina								*		

COMMON NAME	LATIN NAME	NBAN	NGIR	NMAR	NVEL	SBAR	SDHR	SHIN	SJES	SKHI	SNAL	SNAR	SRAT	SSHO
Pochard, White-eyed	Aythya nyroca										*	*		
Pratincole, Collared	Glareola pratincola			5										
Pratincole, Small Indian	Glareola lactea			5										
Quail, Blackbreasted	Coturnix coromandelica	*		*				*						
Quail, Button	Turnix tanki	*												
Quail, Common	Coturnix coturnix	*				*	*					*		
Quail, Jungle Bush	Perdicula asiatica	*												
Quail, Rock Bush	Perdicula argoondah	*						*						
Raven	Corvus corax												*	
Redshank, Common	Tringa totanus		*	6										
Redshank, Dusky	Tringa erythropus	*	*	6										
Redstart	Phoenicurus phoenicurus													*
Redstart, Black	Phoenicurus ochruros	*										*		
Robin, Indian	Saxicoloides fulicata	*										*		*
Roller, European	Coracias garrulus	*		*			*							
Roller, Indian	Coracias benghalensis	*		*			*					*	*	*
Rosefinch, Common	Carpodacus erythrinus	*												*
Ruff and Reeve	Philomachus pugnax	*	*											
Sanderling	Calidris alba		*											
Sandgrouse, Imperial	Pterocles orientalis											*		
Sandgrouse, Indian	Pterocles exustus	*				*						*		
Sandgrouse, Painted	Pterocles indicus	*										*		
Sandgrouse, Spotted	Pterocles senegallus											*		
Sandpiper, Broadbilled	Limicola falcinellus			*										
Sandpiper, Common	Tringa hypoleucos	*	*	*		*	*				*	*		*
Sandpiper, Green	Tringa ochropus	*										*		
Sandpiper, Marsh	Tringa stagnatilis	*												
Sandpiper, Wood	Tringa glareola	*									*			
Shag, Indian	Phalacrocorax fuscicollis		*											
Shelduck, Ruddy	Tadorna ferruginea	*				*					*			
Shikra	Accipiter badius	*					*					*		*
Shoveller	Anas clypeata	*	*								*			
Shrike, Baybacked	Lanius vittatus	*		*			*					*		*
Shrike, Brown	Lanius cristatus			*										
Shrike, Common Wood	Tephrodornis pondicerianus	*		*										
Shrike, Grey	Lanius excubitor	*		*			*					*		*
Shrike, Redbacked	Lanius collurio	*	*	*								*		*
Shrike, Rufousbacked	Lanius schach	*		*										
Skimmer, Indian	Rynchops albigollis		*							*				
Snipe, Fantail	Gallinago gallinago	*		*										
Snipe, Jack	Gallinago minima	*												
Snipe, Painted	Rostratula benghalensis	*									*			
Sparrow, House	Passer domesticus	*	*	*								*		
Sparrow, Yellowthroated	Petronia xanthocollis	*		*								*		*
Sparrow-hawk	Accipiter nisus	*												*
Sparrow-hawk, Besra	Accipiter virgatus	*												
Spoonbill	Platalea leucorodia	*	*			*	*			*	*			
Spurfowl, Red	Galloperdix spadicea	*												
Stilt, Blackwinged	Himantopus himantopus	*	*	*		*	*					*		
Stint, Little	Calidris minuta		*				*				*			*
Stint, Temminck's	Calidris temminckii	*												
Stork, Blacknecked	Ephippiorhynchus asiaticus	*									*			
Stork, Openbill	Anastomus oscitans	*		*		*	*				*			
Stork, Painted	Mycteria leucocephala	*	*	*		*			*	*	*	*		
Stork, White	Ciconia ciconia			*		*					*			
Stork, Whitenecked	Ciconia episcopus	*									*			
Sunbird, Purple	Nectarinia asiatica	*	*									*		*
Swallow	Hirundo rustica	*	*	*								*		*
Swallow, Indian Cliff	Hirundo fluviicola	*												
Swallow, Redrumped	Hirundo daurica	*												
Swallow, Wiretailed	Hirundo smithii	*		*		*					*			

COMMON NAME	LATIN NAME	NEAN	NSIR	NMAK	NVEL	SEAR	SUMK	SHIN	SJES	SKHI	SNAL	SNAR	SKAT	SSHI
		SMAR												
Swift, Alpine	Apus melba	*						*						
Swift, Crested	Hemiprocne longipennis	*												
Swift, House	Apus affinis	*						*					*	
Swift, Palm	Cypsiurus parvus	*												
Tailorbird	Orthotomus sutorius	*											*	*
Teal, Common	Anas crecca			*							*	*		
Teal, Cotton	Nettapus coromandelianus										*			
Teal, Lesser Whistling	Dendrocygna javanica	*									*			
Tern, Caspian	Hydroprogne caspia			*										
Tern, Gullbilled	Gelochelidon nilotica			*	*									
Tern, Indian Lesser Crested	Sterna bengalensis			*										
Tern, Indian River	Sterna aurantia	*		*										
Tern, Little	Sterna albifrons			*										
Tern, Whiskered	Chlidonias hybrida	*		*	*							*		
Thrush, Blue Rock	Monticola solitarius	*												
Thrush, Blueheaded Rock	Monticola cinclorhynchus	*												
Tit, Grey	Parus major	*												*
Tit, Yellowcheeked	Parus xanthogenys													*
Tree Pie, Indian	Dendrocitta vagabunda	*	*					*					*	
Turnstone	Arenaria interpres			*										
Vulture, Egyptian	Neophron percnopterus	*			*			*						
Vulture, Griffon	Gyps fulvus	*												
Vulture, Indian Black	Sarcogyps calvus	*										*		
Vulture, Indian Longbilled	Gyps indicus	*												
Vulture, Indian Whitebacked	Gyps bengalensis	*	*	*	*		*	*				*		*
Wagtail, Forest	Motacilla indica	*												
Wagtail, Grey	Motacilla cinerea	*		*										*
Wagtail, Large Pied	Motacilla maderaspatensis	*		*								*		*
Wagtail, White	Motacilla alba	*												*
Wagtail, Yellow	Motacilla flava	*		*								*		
Wagtail, Yellowheaded	Motacilla citreola	*	*									*		
Warbler, Blyth's Reed	Acrocephalus dumetorum	*												
Warbler, Booted	Hippolais caligata	*										*		
Warbler, Brown Leaf	Phylloscopus collybita	*										*		
Warbler, Desert	Sylvia nana											*		
Warbler, Dull Green Leaf	Phylloscopus trochiloides	*												
Warbler, Grasshopper	Locustella naevia	*												
Warbler, Indian Great Reed	Acrocephalus stentoreus	*	*									*		
Warbler, Large Crowned Leaf	Phylloscopus occipitalis	*												
Warbler, Moustached Sedge	Acrocephalus melanopogon	*												
Warbler, Olivaceous Leaf	Phylloscopus griseolus	*												
Warbler, Orphean	Sylvia hortensis	*		*								*		
Warbler, Paddyfield	Acrocephalus agricola	*												
Warbler, Streaked Fantail	Cisticola juncidis	*												
Warbler, Tickell's	Phylloscopus affinis	*												
Waterhen, Whitebreasted	Amaurornis phoenicurus	*									*			
Wheatear, Desert	Oenanthe deserti	*		*		*								
Whimbrel	Numenius phaeopus		*											
White-eye	Zosterops palpebrosa	*	*											*
Whitethroat	Sylvia communis	*												
Whitethroat, Lesser	Sylvia curruca	*		*										*
Wigeon	Anas penelope										*			
Woodpecker, Lesser	Dinopium benghalense	*	*					*						*
Goldenbacked														
Woodpecker, Pigmy	Picoides nanus	*												
Woodpecker, Yellowfronted Pied	Picoides maharattensis	*						*			*			
Wren-warbler, Ashy	Prinia socialis	*		*										*
Wren-warbler, Franklin's	Prinia hodgsonii	*												
Wren-warbler, Jungle	Prinia sylvatica	*												
Wren-warbler, Plain	Prinia subflava	*	*								*			
Wren-warbler, Rufousfronted	Prinia buchanani	*									*			

COMMON NAME	LATIN NAME	NBAN	NGIR	NMAR	NVEL	SBAR	SDHR	SHIN	SJES	SKHI	SNAL	SNAR	SRAT	SSHO
Wren-warbler, Streaked	Prinia gracilis											*		
Wryneck	Jynx torquilla	*					*					*		*

1. There was considerable variation in the common names of birds reported from various parks and sanctuaries. These names have been standardised from 'A Synopsis of the Birds of India and Nepal' (Ripley 1982). Latin names are also taken from this book.
2. Ratanmahal and Shoolpaneshwar Sanctuaries reported 'Cuckoo-shrike'; it is unclear if they referred to the Large Cuckoo-shrike or the Blackheaded.
3. Velavadar National Park reported a 'Spotted Eagle'; it is not clear if this is the Lesser or the Greater.
4. Khijadiya Sanctuary reported a 'Pelican' without specifying if it is the Rosy or the Spottedbilled.
5. A 'Pratincole' was reported from Velavadar National Park; whether this is the Collared or the Small Indian is unclear.
6. Velavadar National Park reported a 'Redshank'; it is unclear if this is the Common or the Dusky.

SOURCES

The following sources have been used in compiling the above lists (for full references please see the relevant directory sheets):

Bansda National Park : Q1, Note, MP
 Gir National Park : Q1, BRO, Chavan-b, Sinha, Checklist
 Marine National Park : Q1, FV, BRO/MAR3, Anon, Parmar, Chavan
 Velavadar National Park : Q1, FV

Barda Sanctuary : Q1
 Dhrangadhra Sanctuary : Q1, FV, MP
 Hingolghadh Sanctuary : Q1
 Jessore Sanctuary : Q1
 Khijadiya Sanctuary : Q1
 Nal Sarovar Sanctuary : Q1
 Narayan Sarovar Sanctuary : Q1
 Ratanmahal Sanctuary : Q1
 Shoolpaneshwar Sanctuary : Q1, Checklist

COMMON AND SCIENTIFIC NAMES OF MAMMALS AND REPTILES REPORTED FROM
NATIONAL PARKS AND SANCTUARIES IN GUJARAT *

MAMMALS

Common NameScientific Name

Antelope, Fourhorned (Chowsingha)	Tetracerus quadricornis
Antelope, Indian (Blackbuck)	Antelope cervicapra
Ass, Asiatic Wild	Equus hearionns
Badger, Honey (Ratel)	Mellirhora copensia
Bear, Sloth	Melarsus ursinus
Boar, Indian Wild	Sus scrofa
Bull, Blue (Nilgai)	Boselaphus tragocamelus
Caracal	Felis caracal
Cat, Desert	Felis libyca
Cat, Jungle	Felis chaus
Deer, Barking (Muntjac)	Muntiacus muntjak
Deer, Spotted (Chital)	Axis axis
Dog, Indian Wild (Dhole)	Cuon alpinus
Dolphin, Common	Delphinus delphis
Dugong (Sea-cow)	Dugong dugon
Fox, Indian	Vulpes bengalensis
Fox, Red	Vulpes vulpes
Gazelle, Indian (Chinkara)	Gazella gazella
Hare, Indian	Lepus nigricollis
Hedgehog, Longeared	Hemiechinus auritus
Hyena, Striped	Hyaena hyaena
Jackal	Canis aureus
Langur, Common (Hanuman Monkey)	Presbytis entellus
Leopard (Panther)	Panthera pardus
Lion	Panthera leo
Macaque, Rhesus	Macaca mulatta
Mongoose, Common	Herpestes edwardsi
Pangolin, Indian	Manis crassicaudata
Porcupine, Indian	Hystrix indica
Sambar	Cervus unicolor
Squirrel, Common Giant Flying	Petaurista petaurista
Squirrel, Fivestriped Palm	Funambulus pennanti
Squirrel, Indian Giant	Ratufa indica
Squirrel, Threestriped Palm	Funambulus palmarum
Tiger	Panthera tigris
Whale, Blue	Balaenoptera musculus
Wolf	Canis lupus

REPTILES

Common Name

Scientific Name

Boa, John's Earth	<i>Eryx johni</i>
Boa, Russell's Earth	<i>Eryx conicus</i>
Cobra, Indian	<i>Naja naja</i>
Crocodile, Marsh or Mugger	<i>Crocodylus palustris</i>
Gecko, Fat-tailed	<i>Eublepharis macularius</i>
Krait, Common Indian	<i>Bungarus caeruleus</i>
Monitor, Common Indian	<i>Varanus bengalensis</i>
Monitor, Desert	<i>Varanus griseus</i>
Python, Indian	<i>Python molurus</i>
Snake, Black-banded Sea	<i>Hydrophis nigrocinctus</i>
Snake, Common Green Whip	<i>Ahaetulla nasutus</i>
Snake, Common Rat (Dhaman)	<i>Ptyas mucosus</i>
Snake, Common Wolf	<i>Lycodon aulicus</i>
Tortoise, Starred	<i>Geochelone elegans</i>
Turtle, Green	<i>Chelonia mydas</i>
Turtle, Leathery	<i>Dermochelys coriacea</i>
Turtle, Olive Ridley	<i>Lepidochelys olivacea</i>
Viper, Russell's	<i>Vipera russelli</i>
Viper, Saw-scaled	<i>Echis carinatus</i>

* There was considerable variation in the common names of mammals and reptiles reported from various parks and sanctuaries of Gujarat. These names have been standardised with reference to the following standard texts:

For mammals: The Book of Indian Animals (Prater, 1980).

For reptiles: The Book of Indian Reptiles (Daniel, 1983) and Common Indian Snakes (Whitaker, 1978)

Proposals for an Improved Wildlife Protected Area
Network in Gujarat

The Government of India recently commissioned the Wildlife Institute of India, Dehradun, to evaluate the adequacy of the existing network of wildlife protected areas and to propose a network that covers the range of biological diversity in the country. The Institute's report, released in 1988, includes recommendations for an improved protected area network in each state (Rodgers and Panwar, 1988a&b). Given below are the proposals relevant to Gujarat, in which certain additions to, and modifications of, the existing national parks and sanctuaries have been suggested.

(Editorial note: The text given below is reproduced almost verbatim from the report; any changes made are only for the sake of clarity. Our own comments are given in footnotes.)

Summary of Recommendations

Major recommendations are made for increasing conservation status in Kutch. The Wild Ass WLS (Dhrangadhra), of Little Rann is to be partially upgraded to park level and boundaries redrawn to exclude intensive mining etc. A small core area of Narayan Sarovar is proposed as park, and the longstanding suggestion to develop a major protected area in the Great Rann is strongly endorsed. Two small bustard sanctuaries are also proposed.

In Kathiawar and Surat, there are fewer proposals. It is strongly recommended that Gir National Park be extended to 1000 sq km leaving a buffer of 409 sq km as WLS. Purna WLS should be established in the Dang's teak forest.

Along the coast we propose surveys to demarcate small sanctuaries in Kori Creek, in the Gulf of Cambay and on Alibet Island, a mangrove island off the Narmada River.

Details of Proposed Protected Areas

Biogeographic Zone 3 - Desert
Province 3A - Kutch

- | | |
|--|--|
| 1) Wild Ass NP
1,000 sq km
Wild Ass WLS
2,000 sq km | The existing Wild Ass WLS of 4953 sq km in the Little Rann of Kutch contains the world's <u>only</u> viable population of Indian Wild Ass. The sanctuary also houses many villages, factories, salt mine workings and large numbers of resident and migratory domestic stock. Disturbance is increasing and the area is in <u>urgent</u> need of management attention. |
|--|--|

We strongly recommend the creation of a totally disturbance-free core zone of 1000 sq km to be upgraded as a park, and a buffer zone of 2000 sq km as WLS. These figures are tentative suggestions. There is a need to keep some of the favoured islands or bets in the park and a portion of the higher grazing lands peripheral to the lower saltflats. Saltflat areas of less disturbance or which are traditional movement routes should be maintained as corridors

between bets and periphery.

The highly industrialised areas and intensive salt workings should be excluded from the WLS. We estimate some 2000 sq km may be so degazetted. Such areas can have no long-term role in important conservation sites, and attempts to police them only detracts from management ability elsewhere.

Considerable survey and land use planning input will be necessary to determine optimum management solutions.

- 2) Great Rann of
Kutch NP*
1,000 sq km

The Great Rann is a seasonally flooded salt marsh with islands of higher non-saline soils and vegetation. The area once had wild ass, there is a tiny relict population still there. The waterfowl are spectacular with Asia's only long-term breeding sites for flamingo.

Survey is needed to select proper boundaries, localities near to Pachem and Kadir 'islands' may be most suitable.

- 3) Narayan Sarovar
NP 100 sq km
Narayan Sarovar
WLS 665 sq km

Narayan Sarovar WLS of 765 sq km # in the hill system south of the Great Rann, is the only dryland protected areas in Kutch. It has populations of important desert animals including gazelle, caracal, wolf and great Indian bustard. We strongly propose a core area of 100 sq km be developed as full park.

- 4 & 5) Banni WLS
20 sq km
Mandvi WLS
20 sq km

These small proposals are grassland areas with significant populations of great Indian bustard and, potentially, lesser florican as well.

Biogeographic Zone 4 - Semi-Arid Province 4B - Gujarat-Rajwara

- 1) Gir NP 1000 sq km
Gir WLS 409 sq km

The existing Gir Park-Sanctuary complex has a central park of 259 sq km. This proposal suggests the park be increased to 1000 sq km with a consequent decrease in sanctuary area. The park should include areas of the eastern grassland communities as well as the teak and mixed woodlands.

This proposal is considered necessary to give adequate long term protection to the only population of Asiatic Lion in the world.

* A Kutch Desert Sanctuary in the Great Rann has already been established, spread over an area of 7500 sq km.

Narayan Sarovar Sanctuary spreads over 307.54 sq km, as per our information.

- 2) Nal Sarovar NP Nal Sarovar WLS is a major wetland for migratory water fowl. Our proposal raises the conservation level in accordance with the areas especial biological values.

Biogeographic Zone 5 - Western Ghats
Province SB - Western Ghat Mountains

- 1) Purna WLS Purna WLS is at the northern extremity of the Western Ghats and is an important part of the national network of protected areas protecting the varied resources of this zone. Purna has excellent examples of moist teak forests.
180 sq km

Biogeographic Zone 10 - Coasts
Province 10A - Western Coasts

- 1) Kori Creek WLS A proposal to give protection to the depleted 20 sq km mangrove and coral systems of this potentially productive part of the Kutch coastline. Much survey will be needed to identify the optimum locality.
- 2) Cambay WLS The historic gulf of Cambay is a shallow sea of mudflats and sand banks, a habitat poorly protected on the western coastal zone of India. Survey should seek to locate an area of varied habitat with remnants of green turtle nesting population. The sanctuary should include the shore line and littoral vegetation.
10 sq km

LIST OF NAMES AND ADDRESSES OF NGOs ASSOCIATED WITH NATIONAL PARKS AND
SANCTUARIES IN GUJARAT

1. World Wide Fund for Nature - India
Rajkot Divisional Office
c/o Vidyut Electronics
Near Fire Brigade Station
Sadar, Rajkot - 360001
Gujarat

2. Bhavnagar Conservation Society
Bhav Vilas
Near Gaurishankar Lake
Bhavnagar - 364003
Gujarat

3. Hingolghadh Nature Education Programme
Ala Khacher Trust
14 Jayant Society
Rajkot - 360004
Gujarat

- Junagadh Nature Conservation Society
- Jamnagar Nature Conservation Society
- Environment

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