

ACTION HISTORY OF RTI REQUEST No.WLIOI/R/E/20/00052				
Applicant Name		Ishan		
Text of Application		Kindly provide the following information under Right to Information Act, 2005, section 6(1) and section 6(3): 1. Kindly provide all correspondence/letters/project documents related to Project Lion shared between the Wildlife Institute of India and the Ministry of Environment, Forest and Climate Change, Prime Ministers Office or any other stakeholder. 2. Name and contact details of the CPIO and the First Appellate Authority for this application		
Reply of Application		Kindly see the attached letter. All documents of reply has been sent through speed post.		
SN.	Action Taken	Date of Action	Action Taken By	Remarks
1	RTI REQUEST RECEIVED	30/09/2020	Nodal Officer	
2	REQUEST FORWARDED TO CPIO	01/10/2020	Nodal Officer	Forwarded to CPIO(s) : (1) P.K.Aggarwal
3	ADDITIONAL PAYMENT REQUIRED FOR INFORMATION	09/10/2020	P.K.Aggarwal-(CPIO)	You are requested to deposit an additional fee of Rs.138/- [69 pages @ 2/page] u/s 7(3) of RTI Act, 2005 towards the cost of providing the certified photocopy of documents. The fee may please be deposited within 30 days from the receipt of this reply failing which your RTI will stand disposed of.
4	ADDITIONAL PAYMENT RECEIVED FROM REQUESTER	09/10/2020	RTI Applicant	
5	REQUEST DISPOSED OF	13/10/2020	P.K.Aggarwal-(CPIO)	
<div>Print</div>				

SPEED POST

No. WII/RTI/CPIO/2020-21 (Qtr-II)/57

Date: 12 October, 2020

To,

Mr. Ishan
170, Top Floor,
Santi Nagar, Dehli-110065
Email: ikukreti@gmail.com
Mob.: 08447270352

Sub.: Information under RTI Act, 2005-reg.

Ref.: Your Online RTI No. WLIOI/R/E/20/00052 dated 23/08/2020

Dear Sir,

With reference to your RTI application cited above under RTI Act, 2005 this is to confirm that additional fee deposited by you towards the cost of providing the photocopy of requested documents under RTI Act, 2005 has been received and the requested information sought by you is attached herewith as **Annexure-I**.

In case, you want to go for an appeal in connection with the information provided, you may appeal to the Appellate Authority indicated below within **thirty days** from the date of receipt of this letter.

Director, WII
FAA & Director
Address: Wildlife Institute of India, Chandrabani, Dehradun
Phone No.: 01352640910

Thanking you,


NO & CPIO (RTI)

ANNEXURE-I**F.No. WII/Dean/4/4/2014****Date: 07.10.2020****Sub.: Reply of Manual/Online RTI No. WLIOI/R/E/20/00052 dated 30/09/2020 of Mr. Ishan, Delhi under RTI Act, 2005-reg.****Ref.: Office Note No. WII/RTI/CPIO/2020-21 (Qtr-II)/57 dated 01/10/2020 from O/o CPIO, RTI, WII****Dear Sir,**

Please refer to application cited above under RTI Act, 2005. In this context, the point-wise response to queries asked by applicant is given below:

Information Sought under RTI	Reply
1. Provide all correspondence/letters/project documents related to Project Lion shared between the Wildlife Institute of India and the Ministry of Environment, Forest and Climate Change, Prime Minister's Office or any other stakeholder	All correspondence between this Institute and the MoEFCC regarding Project Lion is enclosed (page 1-69). There has been no communication of this Institute with PMO regarding Project Lion.
2. Name and contact details of the CPIO and the First Appellate Authority for this application	(i) Name of the CPIO-Mr. P.K. Aggarwal Contact details- Ph. No. 0135-2646110, E-mail ID-pka@wii.gov.in (ii) Name of the First Appellate Authority- Dr. Dhananjai Mohan Contact details- Ph. No. 0135-2646101 E-mail ID- dwii@wii.gov.in

INFORMATION PROVIDED
UNDER RTI

**Signature of Concerned Authority
(Officer Name & Designation)**

To,
NO & CPIO (RTI)
Wildlife Institute of India,
Chandrabani Dehradun

(Y.V. Jhala)
संकाय अध्यक्ष / Dean
भारतीय वन्यजीव संस्थान
Wildlife Institute of India
देहरादून / Dehradun

ATTESTED

CPIO, Wild Life Institute of India, Dehradun

Spud
7/10/2020
SYA

64

Subject: Fwd: Preparation of Detailed Project Document for "Project Lion" - Reg.
From: Yadvendradev Jhala <yvjhala@gmail.com>
Date: 06-10-2020, 16:33
To: srikant Singh Negi <srikant@wii.gov.in>

----- Forwarded message -----

From: DWII <dwii@wii.gov.in>
Date: Wed, Aug 19, 2020 at 2:32 PM
Subject: Fwd: Preparation of Detailed Project Document for "Project Lion" - Reg.
To: Dr. Y.V. Jhala <jhalay@wii.gov.in>
Cc: dmohan <dmohan@wii.gov.in>, dean <dean@wii.gov.in>

----- Forwarded Message -----

Subject: Preparation of Detailed Project Document for "Project Lion" - Reg.
Date: Wed, 19 Aug 2020 13:43:44 +0530
From: Aditya Bisht <adityabishtmoefcc@gmail.com>
To: dwii <dwii@wii.gov.in>
CC: Vinod Ranjan <adgwl-mef@nic.in>, igfwl-mef <igfwl-mef@nic.in>, Rakesh Kumar JAGENIA <digwl-mefcc@gov.in>, Sasi Kumar <sasiwllindia@gmail.com>

Respected Sir,

Greetings!

The undersigned has been directed to attach herewith the e-scanned copy of the letter of DIG (WL), MoEF&CC regarding the subject mentioned above.

May like to see.

Thanking you,

Yours sincerely,

--

Aditya Bisht

Project Scientist
WII-GIZ
Wildlife Division, 6th Floor, Vayu Wing, Indira Paryawaran Bhawan
Ministry of Environment, Forest and Climate Change (MoEF&CC)
Jor Bagh Road, New Delhi-110003
India

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M: +91-8376994944

E: aditya.bisht@gov.in , adityabishtmoefcc@gmail.com

--

Yadvendra Dev Jhala, Ph.D.
Dean & Scientist "G"
Wildlife Institute of India
Dehradun, India 248001
Tel : +91 135 2646223

— Attachments: —

letter to DWII- Lion.pdf

156 KB

INFORMATION PROVIDED
UNDER RTI

AT
CPD, Wildlife Institute of India, Dehradun

**Government of India
Ministry of Environment, Forest and Climate Change
Wildlife Division**

**6th Floor, Vayu Wing,
Indira Paryavaran Bhawan
Jor Bagh Road
New Delhi.**

F. No 1-63/2007 WL (part)

Dated: 18th August 2020

**The Director
Wildlife Institute of India
Dehradun.**

Sub: Preparation of Detailed Project Document for "Project Lion" - Reg.

Sir,

Conservation of Asiatic Lion has been accorded due priority by Government of India. During his address to the nation on 15th August 2020, on the occasion of the Independence Day, Hon'ble Prime Minister has also mentioned initiation of a Project for Conservation of Lions in the country.

In this context, the undersigned is directed to request that the Wildlife Institute of India to kindly prepare a detailed 'Project Lion' Document, which would encompass conservation of the species on a Project mode in the entire country, with inclusion of adequate budgetary provisions. While preparing the said Project Document, experts, including those from State of Gujarat, may also be consulted.

It is also requested that the detailed Project Document may kindly be submitted to this Ministry, by 15th September, 2020.

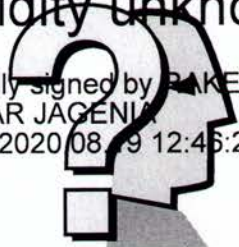
Yours faithfully,

**(Rakesh Kumar Jagenia)
Deputy Inspector General of Forests (WL)
E.mail: digwl-mefcc@gov.in**

Copy to: Sr. PPS to Addl. DGF(WL)/Sr. PPS to IGF(WL), MoEFCC

Validity unknown

Digitally signed by RAKESH
KUMAR JAGENIA
Date: 2020.08.29 12:45:22 IST



**INFORMATION PROVIDED
UNDER RTI**

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66

Subject: Fwd: Detailed note on Project Dolphin and Project Lion
From: Yadvendradev Jhala <yvjhala@gmail.com>
Date: 06-10-2020, 16:32
To: srikant Singh Negi <srikant@wii.gov.in>

----- Forwarded message -----

From: dwii <dwii@wii.gov.in>
Date: Mon, Aug 17, 2020 at 6:18 PM
Subject: Detailed note on Project Dolphin and Project Lion
To: DGF and SS <dgfindia@nic.in>
Cc: Mr Soumitra Dasgupta <adgwl-mef@nic.in>, IG Wildlife <igfwl-mef@nic.in>, DIG Wildlife (Rakesh Jagenia) <digwl-mef@nic.in>, Dean WII <dean@wii.gov.in>, Qamar Qureshi <qnq@wii.gov.in>

Sir,

As per your instructions, detailed note on Project Dolphin and Project Lion is being enclosed for your kind perusal and necessary action.

Regards

Dhananjai Mohan

Director WII

INFORMATION PROVIDED
UNDER RTI

Yadvendradev Jhala, Ph.D.
Dean & Scientist "G"
Wildlife Institute of India
Dehradun, India 248001
Tel : +91 135 2646223

— Attachments: —

Project Dolphin_17 Aug 2020.docx	5.2 MB
Project Lion 17 Aug 2020.docx	647 KB

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Project Lion

Introduction and Need for the Project

India is the last home of the Asiatic lion (*Panthera leo leo*). After the initial efforts of the Nawab of Junagadh prior to India's independence the last 50 odd wild lions were saved from trophy hunting in the Gir Forests of Saurashtra. Subsequently with the efforts of the government of Gujarat State and the Forest Department lions have since increased to around 700 occupying about 13,000 km² of human dominated landscape in Kathiawar peninsula. Lions were initially made the National animal of India after independence, which status they subsequently lost to the tiger in 1973.

The conservation of the Asiatic lion in the greater Gir ecosystem is a conservation success story and largely the credit can be attributed to the people of Saurashtra who have a special cultural bond and extreme tolerance toward this large carnivore. However, with an increase in lion abundance and density come unique problems that were hereto not experienced by conservation practitioners. A fresh approach that imbibes a thorough understanding of lion ecology, socio-economics of the local communities, and the development agenda of the region is required to ensure the continued persistence of the Asiatic lions in India. The fortunes of the lion of Gir lions are tied with those of the people of Saurashtra and actions of lion conservation needs to ensure the wellbeing of local communities and their livelihoods.

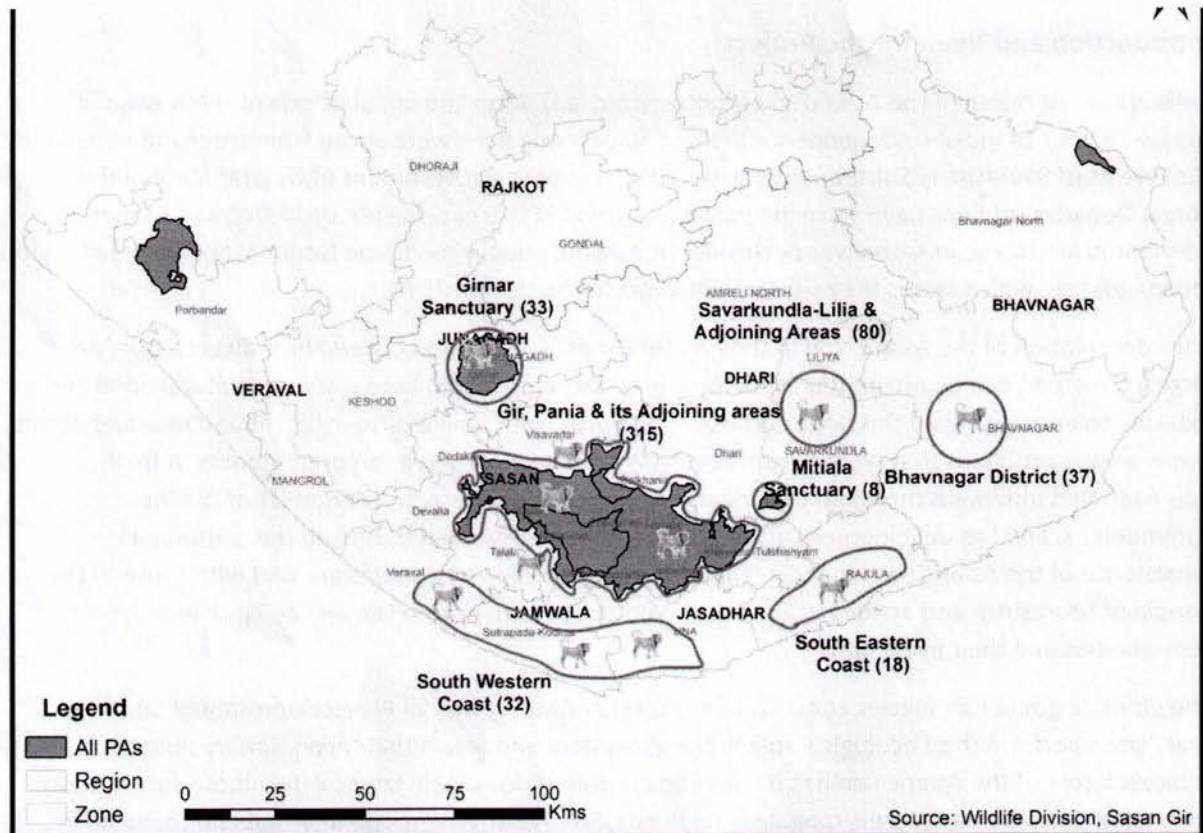
The ultimate goal of all species conservation projects including that of Project Lion should be to ensure that "Lions perform their ecological role in the ecosystem and retain their evolutionary potential". The ecological role of the Asiatic lion has been as an apex predator within tropical deciduous forest, thorn forest and scrub forest systems ranging from Persia, South Eastern Europe into India up to Plamu in Bihar, north of the Narmada river. Recent full genome sequencing of Gir lions has proved that Asiatic lions are extremely inbred. In inbred populations, evolutionary processes of natural selection ensure that deleterious alleles of genes that can cause inbreeding depression are purged out of the population by ensuing survival of the fittest. Unfortunately, well-meaning health care interventions by the management authorities have disrupted this natural selection process in Gir lions in the past two decades. Now inbreeding depression is manifesting in the Gir lions in the form of 1) Mass mortality and susceptibility to diseases that were already prevalent in the population historically, 2) production of malformed cubs (skeletal defects, vital organ defects, blind, etc). This can and needs to be combated through demographic and genetic management of the lion population as a metapopulation. Several free ranging populations need to be established (without health care) and after several generations individuals mixed between these populations to infuse variation which would otherwise be impossible to bring in without hybridization. Several populations will also act as a safety net against catastrophic events like epidemics or natural calamities that can wipe out single populations.

The people of Saurashtra have borne the brunt for conserving lions. Ecotourism opportunities like home stays, lion and associated biodiversity based tourism in the form of village consortiums needs to be promoted by the Government. The current tourism model is biased to high end, high investment, tourism and lacks the involvement of communities in the true sense. It is these local communities who should be the primary beneficiaries of economies that arise from lions and their ecosystems. It is with the above context the Goal, Objectives and Actions under Project Lion are envisaged.

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Current range of the Asiatic Lion in Saurashtra landscape

Goal of Project Lion

Asiatic Lions Should Play Their Ecological Role and Retain Their Evolutionary Potential. The Future Generation of Indians should be Proud of Their Natural Heritage which will be Preserved as Nature intended it to be.

Objectives

- 1) To avert any risk of extinction to Asiatic lions and ensure their perpetuation for generations to come
- 2) To ensure that livelihoods of local communities, people of Saurashtra and of India are benefitted by Project Lion and Lion conservation
- 3) To secure and manage lion habitat and mitigate human-lion conflict

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Activities

- 1) Create inviolate space for lions. Large carnivores need vast areas for viable populations and for this reason they serve as umbrella species for biodiversity with the Protected Area designed for their conservation. For Tiger Conservation the mandate of NTCA is to have an inviolate space of 800-1000 km² as core area for a tiger reserve and with a buffer of another 800-1000 km². It is within this human free core do tigers perform their ecological role. Currently the only exclusive space for lions is the 250 km² of the Gir National Park. The rest of the range of the Asiatic lion is shared with people and the lion population subsists of human subsidies. It is important the Project Lion restores sufficient exclusive lion habitat of about 1000 km² through incentivized voluntary relocation of forest villages and *maldhari* settlements from within Gir Conservation Areas so that the only surviving Asiatic lion population gets the space it requires for performing its ecological role. A proper rehabilitation package should be offered to all forest dwellers within the core zone to relocate outside with hand holding and additional perks which may be available from the Gujarat State Government. *Time frame: 3 years*
- 2) Create additional safety net free ranging populations within Gujarat and in India. The Barda Wildlife Sanctuary has been identified and assessed by the Wildlife Institute of India as a potential site where a population of 40 lions can be accommodated in the larger landscape. Investments for incentivized voluntary relocation of about 300 Maldhari families from within Barda WLS needs to be done under Project Lion. A generous rehabilitation package along with other perks from the Government needs to be offered, The Barda Maldharis are willing to relocate and a good incentive will free the wildlife sanctuary for lion reintroduction. The Kuno WLS in Gwalior Madhya Pradesh is ready to receive lions. Kuno already has 750 km² of inviolate National Park in a ~3000 km² of forested landscape with prey densities matching or more than that of Gir PA. A long-term viable lion population can easily be established here. Other sites that have the potential for harbouring a lion population after restorative management are Balaram-Ambaji-Abu landscape on the border of Gujarat and Rajasthan, Sitamata Wildlife Sanctuary in Rajasthan amongst others. Project Lion would develop these habitats for future lion reintroductions. *Time frame: 5 years*
- 3) After establishing 4-5 lion populations these populations would be managed as a metapopulation after disease and genetic studies of individuals to manage the demography of this highly inbred subspecies of lions. *Time frame: On a continuous basis.*
- 4) Disease Profile and Ecology in the Greater Gir Landscape: Understanding the profile of all pathogens, their hosts and epidemiology in relation to wildlife and domestic livestock is essential for prophylactic management of potential epidemics. This research along with vaccination of domestic and feral animals will be undertaken with the Saurashtra landscape. Healthcare of lions will be very selective (avoided as far as possible) as it has detrimental impacts of free ranging wild populations. *Time frame: On a continuous basis*
- 5) Restoration of wildlife habitat through management activities. Due to overgrazing by domestic livestock much of the Gir Protected Area and other potential sites have a large infestation of weeds and invasive species. These need to be managed to promote wild ungulate populations for restoring these ecosystems. Livestock grazing is to be prohibited within core area of the PA and regulated to sustainable densities elsewhere within the PA. Project Lion will address these management activities. *Time frame: 5 years*

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- 6) Crop raiding by wild ungulates is a major source of conflict with local communities. Subsidized seasonal pulsating power fencing will be provided to local farmers. These have been very cost effective and will not result in permanent barriers to wildlife movement corridors as they are only seasonally deployed when a crop is susceptible to raiding by wild ungulates. Often farmers use live AC current to fence their fields resulting in the death of wildlife, lions and sometimes humans. The use of pulsating power fence will be promoted under Project Lion. In addition crop losses would be adequately compensated. *Time frame: 5 years and then on a continuous basis*
 - 7) Development of a quick response team for mitigating conflict across current and potential lion habitat. Four wheel drive vehicles equipped with darting and capture equipment, wildlife capture trained veterinary officer and his team will be deployed at strategic locations to address human-wildlife (lion/leopard) conflict and rescue. *Time frame: 1 year to set up and then on a continuous basis*
 - 8) Reproductive control of certain wildlife species like leopards, nilgai and wild pigs in pockets where they are over abundant may be required to reduce their population growth and density. More human lives are lost to leopard attacks than tigers and lions combined in India. Immuno-contraception and chemical contraception options that are humane ways to reduce fecundity of these animals will be promoted on an experimental research basis by Project Lion. *Time frame: On a continuous basis.*
 - 9) The Project Lion will engage village Panchayats and encourage farmers to manage their land in a lion friendly manner to promote more space for wildlife in a rapidly developing landscape. These village consortiums will be encouraged to engage in ecotourism activities based on lions and biodiversity so that monitory benefits arising are not only harnessed by high end tourist resorts but local communities too benefit from the resource that they help protect. *Time frame: On a continuous basis.*
 - 10) Research into population genetics, population monitoring, disease dynamics and ecology of lions, co-predators, ungulates and socio-economies of local communities will be undertaken by Project Lion. An understanding of ecological and social carrying capacity of the Saurashtra and other potential reintroduction sites will be obtained from this research for better management of lions and their ecosystem. *Time frame: 5 years*
 - 11) Technology based scientific population monitoring of lions, prey and ecosystems as is being for tiger landscapes across India will be done for lions. On ground patrols of staff and their live monitoring will be done using software like MSTRIPES as is being done for Tiger Reserves. *Time frame: On a continuous basis.*
 - 12) Regular press releases would be made during the execution of the project at field sites of the project and also at regional and national level. The official's in-charge of interaction with the media would be clearly identified, so that information flow may happen without any ambiguity. Every effort would be taken to ensure that the media gets an opportunity to understand the project and its implementation with clarity. *Time frame: On a continuous basis.*

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INFORMATION PROVIDED
UNDER RTI

Subject: Fwd: Fwd: LINK- Lion Project Meeting @3 pm (Tuesday)

From: Yadvendradev Jhala <yvjhala@gmail.com>

Date: 06-10-2020, 16:40

To: srikant Singh Negi <srikant@wii.gov.in>

----- Forwarded message -----

From: D Mohan <dmohan.wii@gmail.com>

Date: Mon, Aug 24, 2020 at 6:40 PM

Subject: Fwd: Fwd: LINK- Lion Project Meeting @3 pm (Tuesday)

To: jhalay <jhalay@wii.gov.in>, Yadvendradev Jhala <yvjhala@gmail.com>

Dear Dr Jhala

The meeting to be chaired by DG today has been postponed to 3 pm tomorrow. As I result I may not be able to attend the Lion consultation. You may kindly brief me regarding the deliberations later

Regards

Dhananjai

----- Forwarded message -----

From: DWII <dwii@wii.gov.in>

Date: Mon, 24 Aug, 2020, 10:20 AM

Subject: Fwd: Fwd: LINK- Lion Project Meeting @3 pm (Tuesday)

To: dmohan <dmohan@wii.gov.in>

INFORMATION PROVIDED
UNDER RTI

----- Forwarded Message -----

Subject: Fwd: LINK- Lion Project Meeting @3 pm (Tuesday)

Date: Mon, 24 Aug 2020 07:42:01 +0530

From: Dean, WII <dean@wii.gov.in>

To: Shymal Tikedar <stikadar@gmail.com>, Wildlife PCCF Gujarat <cwlwguj@gmail.com>, dwii <dwii@wii.gov.in>, Yadvendradev Jhala <YVJhala@gmail.com>

Dear Sir,

The following link may please be shared with the concerned officials for the meeting on Project Lion between GFD and WII as instructed by MOEF&CC. DWII and myself will be participating from WII. As discussed over phone, the meeting is scheduled for August 25, Tuesday at 3 PM.

Warm Regards,

Jhala

----- Forwarded message -----

From: Yadvendradev Jhala <yvjhala@gmail.com>

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Date: Fri, Aug 21, 2020 at 5:48 PM

Subject: LINK- Lion Project Meeting @3 pm (Tuesday)

To: Yadvendradev Jhala <YVJhala@gmail.com>

Link- <https://meet.jit.si/projectlionwiigujarat>

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Yadvendradev Jhala, Ph.D.
Dean & Scientist "G"
Wildlife Institute of India
Dehradun, India 248001
Tel : +91 135 2646223

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Yadvendradev Jhala, Ph.D.
Dean & Scientist "G"
Wildlife Institute of India
Dehradun, India 248001
Tel : +91 135 2646223

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UNDER RTI

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Subject: Fwd: components of Projects (Lion, Dolphin)
From: Yadvendradev Jhala <yvjhala@gmail.com>
Date: 06-10-2020, 16:28
To: srikant Singh Negi <srikant@wii.gov.in>

----- Forwarded message -----

From: Director <dwii@wii.gov.in>
Date: Sun, Sep 20, 2020 at 12:08 AM
Subject: Fwd: components of Projects (Lion, Dolphin)
To: Dr. Y.V. Jhala - Dean <jhalay@wii.gov.in>, Sh. Qamar Qureshi - Scientist <qnq@wii.gov.in>, Dr. Vishnupriya Kolipakam - Scientist <vishnupriya@wii.gov.in>, Dr. Kuppusamy Sivakumar - Scientist <ksivakumar@wii.gov.in>
Cc: Dean WII <dean@wii.gov.in>

Dear All,

Since officials of the wildlife division have been discussing and sharing the ideas about the above two projects with senior-most officials of MoEFCC(MEF, Secretary and DGF) and PMO during the last couple of weeks, I requested them to share the same with us for us to get a better idea of the direction that these projects are moving. They did mention that the documents sent by us (detailed project Dolphin and the brief Project Lion) were the basis for the same. The brief ppt shared by them is being shared with you.

Director,
Wildlife Institute of India, Dehradun.

----- Forwarded message -----

From: Rakesh Kumar JAGENIA :digwl-mefcc@gov.in
To: dwii :dwii@wii.gov.in,dhananjaim :dhananjaim@gmail.com
Cc: Mr Soumitra Dasgupta :adgwl-mef@nic.in,soumitra444 :soumitra444@rediffmail.com
Date: Sat, Sep 19, 2020 at 04:44 PM
Subject: components of Projects

Respected Sir

Please find attached slides regarding components of Project Lion and Project Dolphin



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CPIO, Wild Life Institute of India, Dehradun

Yadvendradev Jhala, Ph.D.
Dean & Scientist "G"
Wildlife Institute of India
Dehradun, India 248001

Tel : +91 135 2646223

—Attachments:—

Components of Project Asiatic Lion.pptx	42.6 KB
Components of Project Dolphin.pptx	45.0 KB

ATTACHED
[Signature]
CPDIO, Wild Life Institute of India, Dehradun

**INFORMATION PROVIDED
UNDER RTI**

ATTACHED

CPDIO, Wild Life Institute of India, Dehradun

Components of Project Asiatic Lion

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UNDER RTI

ATTESTED
[Signature]
CPIO, Wild Life Institute of India, Dehradun

(A)

Project Components

Augment and strengthen lion conservation:

- Improve habitat
- Extend habitat of lion population in new areas in Gujarat
- Voluntary rehabilitation of human settlements from Protected Areas

Protect and Improve Lion population:

- Disease surveillance, control and treatment referral center
- Enumeration monitoring of Lion and associated species

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Project Components

Project Management:

- Strengthen Infrastructure
- Establishment of Authority at the Centre

Improved livelihood opportunities:

- Promote ecotourism
- local culture and handicrafts.

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[Signature]
CPIO, Wild Life Institute of India, Dehradun

INFORMATION PROVIDED
UNDER RTI

Subject: Fwd: Project Lion ppt
From: Yadvendradev Jhala <yvjhala@gmail.com>
Date: 06-10-2020, 14:49
To: srikant Singh Negi <srikant@wii.gov.in>

PRINT THE PROPOSAL AND EMAIL FOR RTI also the ppt with 4 slides on one page. rest I shall give later.

----- Forwarded message -----

From: Dean, WII <dean@wii.gov.in>
Date: Mon, Sep 21, 2020 at 10:50 AM
Subject: Project Lion ppt
To: dwii <dwii@wii.gov.in>, Dr.DasGupta <adgwl-mef@nic.in>, Rakesh Kumar JAGENIA <digwl-mefcc@gov.in>, igfwl-mef <igfwl-mef@nic.in>
Cc: Qamar1 <qnq@wii.gov.in>, Vishnupriya Kolipakam <vishnupriya@wii.gov.in>, Kausik Banerjee <sawaj.shardul@yahoo.com>

Dear Sirs,

I was down with COVID infection and just got discharged yesterday from the hospital. Still recovering. Before coming down with the infection we had very fruitful discussions with Gujarat Forest Department Team over VC. Attached is the ppt on the project lion proposal developed based on discussions with CWLW and his team from Gujarat on August 25, 2020. The budget is in two parts, for the Saurashtra Specific component done by GFD and the "rest component" (inclusive of Northern Gujarat - Balaram-Jessor-Ambaji WLS along with Mt. Abu). Total is around 4000 crore for 10 years - if implemented will ensure the survival and conservation of the Asiatic lion for posterity.

Look forward to our meeting. The net can be a problem - so am sharing the pdf's.

Regards,

Jhala

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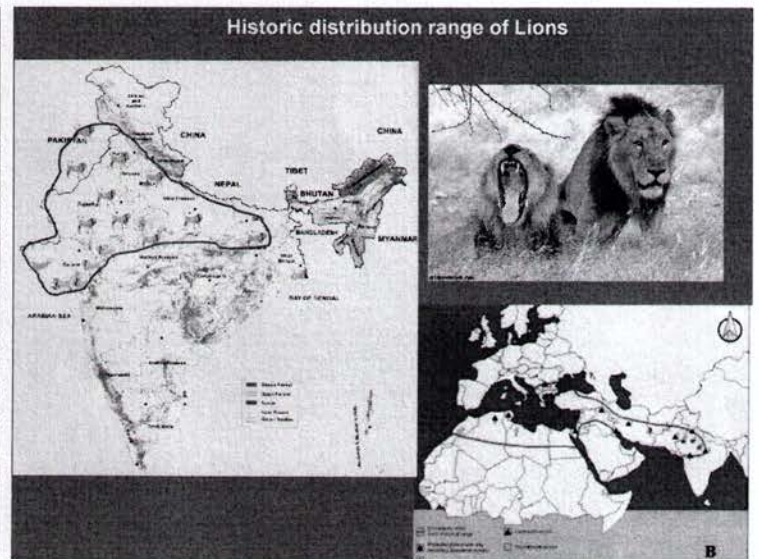
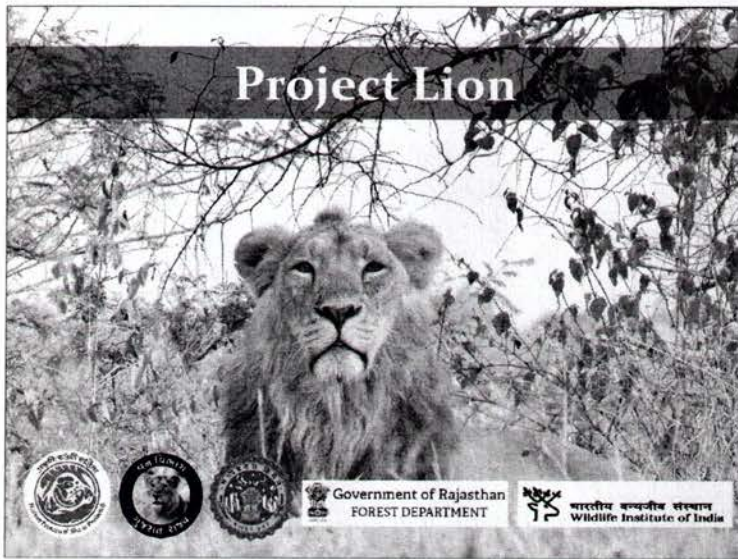
Yadvendradev Jhala, Ph.D.
Dean & Scientist "G"
Wildlife Institute of India
Dehradun, India 248001
Tel : +91 135 2646223

— Attachments: —

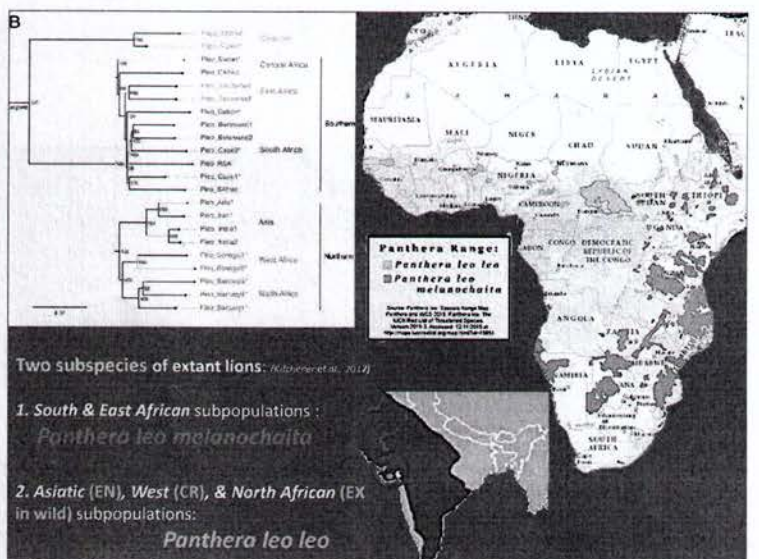
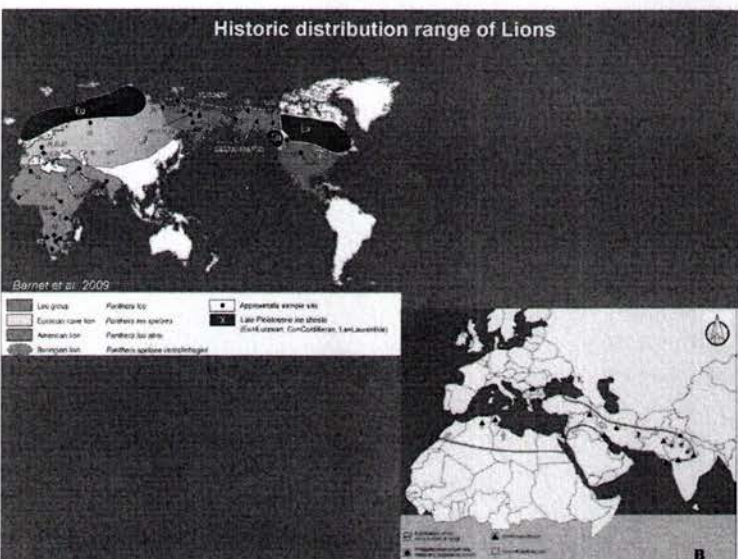
Project_lion_WII_GFD-presentation.pdf	4.6 MB
Project Lion-GFD-WII Combined Proposal September 15, 2020.pdf	12.2 MB

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CPIO, Wild Life Institute of India, Dehradun



INFORMATION PROVIDED
UNDER RTI



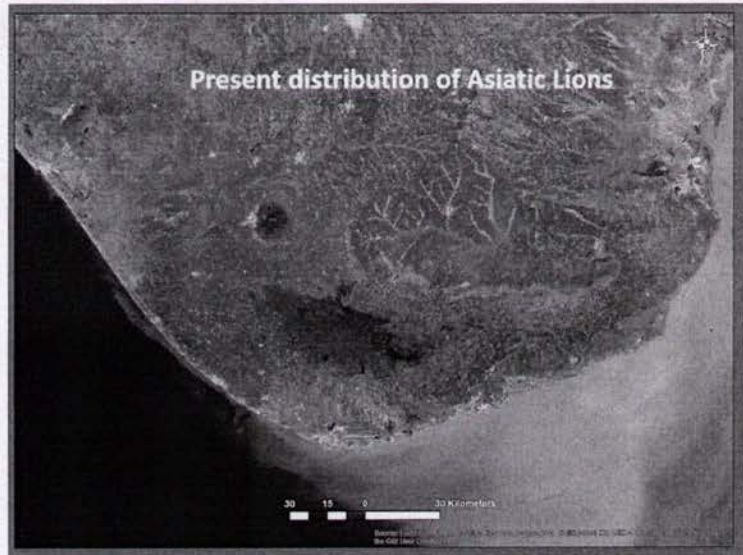


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Lions in India

~ 2,500 years back, Kathiawar peninsula - rising water - isolated the ancestral founder Asiatic lion population. The mainland populations in the meanwhile were dwindling & immigration into Kathiawar population was low— 1st Genetic Bottleneck (O'Brien 2003).

By 1920, < 50 wild lions remained only in the Gir Forests of Junagadh State - 2nd Genetic Bottleneck.



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Timely and stringent protection - Junagadh Nawabs and subsequent management interventions by Gujarat Forest department.

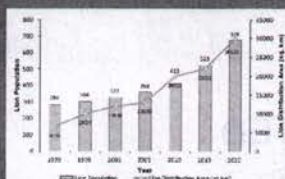
Junagadh 1880 - banning all shikar and trapping of 'any kind of animal' in its territory - without the specific permission of the State (GUSL vol. 13, no. 8, April 1880).

1950 - Lion Census - first census of large mammals - independent India (Dharmakumarsinhji & Wynter-Blyth)

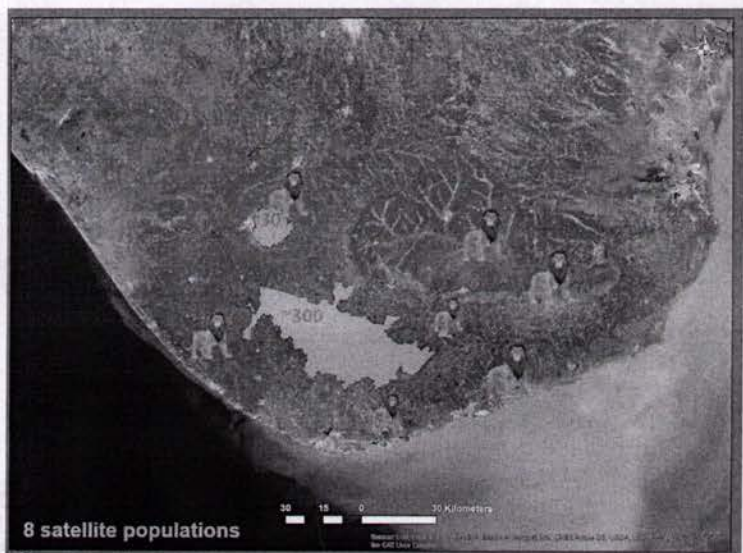
1972 Lion lost its National Animal Status to Tiger

A Conservation Success

Growth of Asiatic lion population during past 30 years →



Year	Lion Population
1972	186
1976	244
1981	259
1985	266
1990	352
1995	423
2000	525
2005	600
2010	675
2012	675

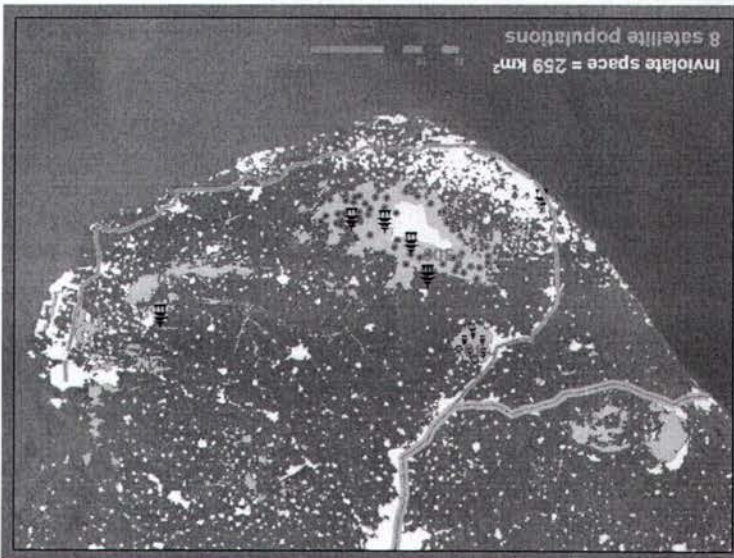


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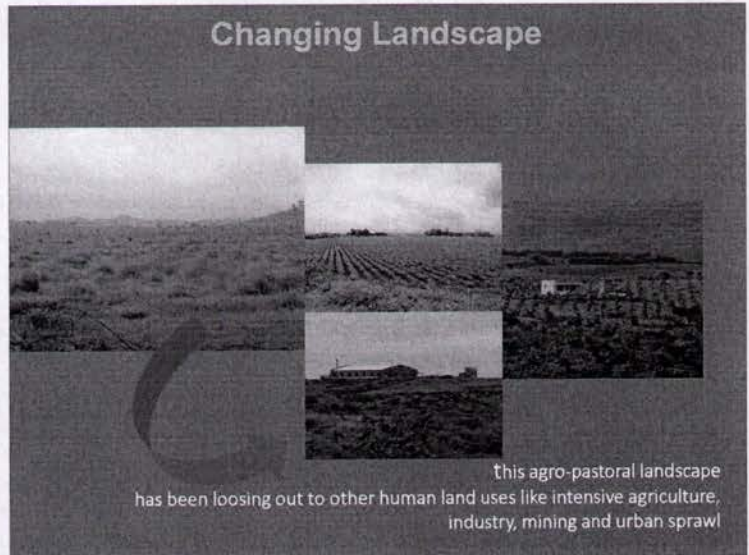
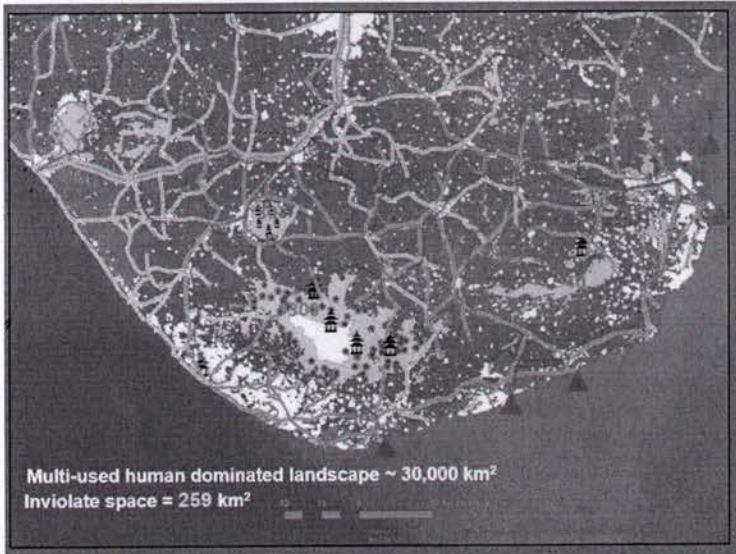
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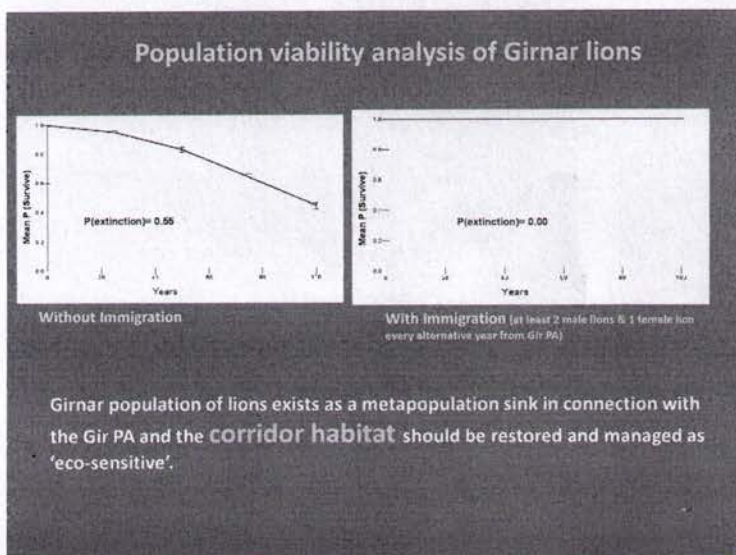


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Proposed Activities:

I. Habitat and Population

- 1) Create inviolate space of 1000 km² within Gir PA with incentivized voluntary relocation of forest villages and Maldhari settlements.

Time frame: 5-10 years; *Responsibilities:* Gujarat Forest Department

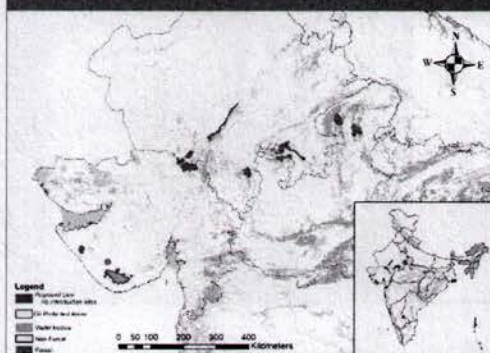
- 2) Habitat improvement and augmentation through weed eradication, restoration of grasslands, securing shelter belts and refuge patches, lion corridor development and incentive driven lion friendly management in eco-sensitive zone.

Time frame: On a continuous basis. **Responsibilities:** GED, MP, FD, and BED.

- 3) Create additional safety net free ranging populations within Gujarat and in India.

Time frame: 5-10 years; *Responsibility:* GFD, MP, FD, RFD, MoEF&CC and WII

Potential sites in Gujarat and elsewhere in India for establishing alternative populations of Gir lions



1. Kuno NP, MP
2. Barda WLS, Gujarat
3. Madhav NP, MP
4. Sitamata WLS, Rajasthan
5. Mukundara, Rajasthan
6. Gandhi Sagar WLS, MP
7. Kumbhalgarh WLS, Rajasthan
8. Jessore Balaram Ambaji Mount Abu WLS, Gujarat

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The Barda-Alech landscape

- Barda habitats ~ 120 sq km inviolate - resettling Maldharis (phasing out) - habitat patches > 4 sq.km as community reserves - smaller as eco-sensitive



- Continue **restocking natural prey base**
- **Soft release few lions** - gradual exposure to local people - low depredation - **appropriate compensation**
- **Protection against poaching**
- **Corridor restoration (?)** - separate free ranging vs. metapopulation

Proposed Activities: continued..

- 4) Manage lion metapopulations through genetics and disease monitoring to improvise demography.

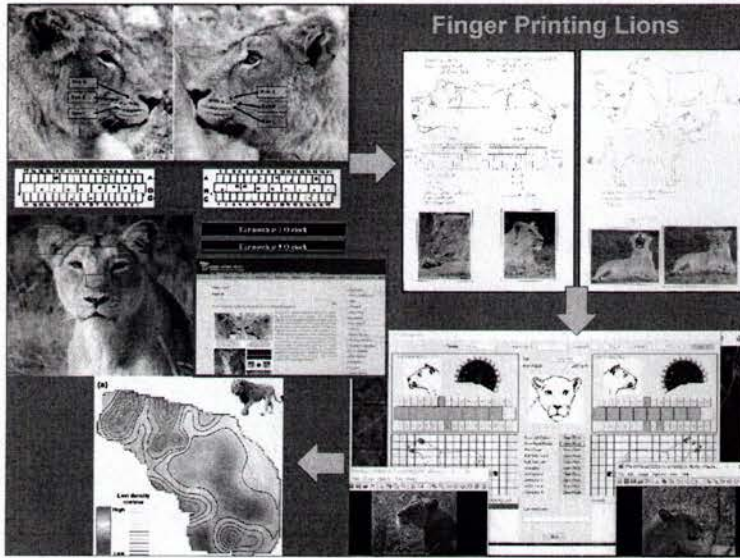
Time frame: On a continuous basis. *Responsibility:* GFD, MP, FD, MoEF&CC and WII.

- 5) Adopt advances scientific tools to evaluate the Status of Lions in Saurashtra at present and other landscapes in future.

Time frame: On a continuous basis at an interval of every 4th year. **Responsibility:** GFD, MP FD, RFD and WII.

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Proposed Activities: continued..

IV. Human-Wildlife Conflict

1) Develop and further strengthen conflict mitigation measures.

Time frame: 5 years then on a continuous basis. *Responsibilities:* State Forest Departments.

2) Strengthening of quick response teams .

Time frame: 1 year for strengthening then on a continuous basis. *Responsibilities:* State Forest Departments.

3) Reproductive control of certain wildlife species like leopards, nilgai and wildpig.

Time frame: On a continuous basis; *Responsibility:* WII and subsequently by State Forest Departments.

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Proposed Activities: continued..

II. Community participation

1) Public outreach to strengthen the involvement of locals in the conservation process.

Time frame: On a continuous basis. *Responsibilities:* State Forest Departments.

2) Supporting livelihoods through eco-tourism.

Time frame: On a continuous basis. *Responsibilities:* GFD.

III. Management of Disease and Epidemics

1) Develop SOP to deal with current disease epidemics and healthcare of lions in the line of NTCA.

Time frame: 5-10 years; *Responsibility:* GFD, MoEF&CC, WII, IVRI and International experts.

2) Disease Profile and Ecology in the Greater Gir Landscape as well as in other reintroduction sites.

Time frame: On a continuous basis. *Responsibility:* IVRI, WII in collaboration with State Forest Departments.

Proposed Activities: continued..

V. Surveillance and monitoring

1) The existing software and hardware infrastructure is to be further strengthened and maintained.

Time frame: On a continuous basis. *Responsibilities:* WII & Gujarat Forest Department initially and then by other state forest departments.

2) Further develop the Program Lion and establish a lion database to store all relevant information related to population, movement, health etc.

Time frame: On a continuous basis. *Responsibilities:* WII & Gujarat Forest Department initially and then by other state forest departments.

VI. Research

1) Research into population genetics, population monitoring, human-wildlife conflict, disease dynamics and ecology of lions, co-predators, ungulates and socio-economies of local communities will be undertaken under the ambit of Project Lion.

Time frame: On a continuous basis; *Responsibility:* WII, IVRI, Other scientific institutions and universities in collaboration with the state forest departments.

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Proposed Activities: continued.

VII. Information Education and Communication

1) Regular press releases and reports would be made at local and national level.

Time frame: On a continuous basis, *Responsibilities:* MoEF&CC, Gujarat Forest Department and State FDs.

VIII. Manpower

1) To provide continuous technical assistance, a **Lion Cell** in the line of NTCA Tiger Cell & MoEFCC Elephant Cell may be established based at MoEFCC, Delhi and WII, Dehradun.

Time frame: On a continuous basis, *Responsibility:* MoEF&CC and WII.

IX. Monitoring and Advisory Committee

National Supervisory and Advisory Committee chaired by DGF, members as CWLW's of Gujarat, Madhya Pradesh, and Rajasthan, Director WII, two lion biologists & one IVRI scientist, member secretary as ADG (wildlife).

Budget for national level implementation of Project Lion

Component	Amount (Rs. in Crore)										Total
	1st Year	2nd Year	3rd Year	4th Year	5th year	6th Year	7th Year	8th Year	9th Year	10th Year	
Preparation of sites for lion reintroduction	282	282	282	282	282	0	0	0	0	0	1410
Lion reintroduction in Kuno NP	15	15	10	10	10	10	10	10	10	10	110
Lion translocation cost for other sites				10	10	15	20	25	25	25	130
SECR based lion population estimation	7			8				10			25
Development & customization of Program LION and database for Gir, Kuno and other sites	1	1	1	2	2	2	2	3	3	3	20
Implementation of MSTRIPES in Kuno & other sites	5	5	5	2	2	2	2	2	2	2	29
Development of tourism zone in Kuno & other sites	5	5	5	5	5	8	8	8	8	8	65
Immunocontraception of leopards & other wildlife to mitigate conflict	5	5	5	5	5	8	8	8	8	8	65
Research	6.5	6.5	4	2	2	2	2	2	2	2	31
Lion Cell at MoEFCC & WII	2.00	2.20	2.42	2.66	2.93	3.22	3.54	3.90	4.29	4.72	32
Information education and public outreach	5	5	5	5	5	5	5	5	5	5	50
Travel	1	1	1	1	1	1	1	1	1	1	10
TOTAL	335	328	320	335	327	56	62	78	68	69	1977

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Budget for Gujarat Forest Department

Component	Amount (Rs. in Crore)										Total
	1st Year	2nd Year	3rd Year	4th Year	5th year	6th Year	7th Year	8th Year	9th Year	10th Year	
Habitat and Population	158.5	159.5	159.5	159.5	159.5	42.25	42.25	42.5	42.5	42.5	1008.5
Community Participation and making them stakeholders	94	69.15	49.32	49.5	49.7	49.92	50.16	50.42	50.72	51.04	563.91
Lion Health Management	30	21	21	16	16	11.5	11.5	11.5	11.5	16.5	166.5
Human Wildlife Conflict Mitigation and adaptation measures	18.626	19.05	19.52	20.03	20.6	21.21	21.88	22.64	23.46	24.36	211.35
Surveillance and monitoring	9.992	5.541	5.6	5.66	5.73	5.29	9.38	5.47	5.56	5.66	59.84
Research	4.21	3.23	3.25	3.28	3.31	3.34	3.37	3.41	3.45	3.5	34.35
Information, Education and Communication	3.5	2.75	2.75	2.75	2.75	3	3	3	3	3	29.5
Grand Total	318.83	280.22	260.93	256.71	257.56	136.5	137.54	138.93	140.18	146.56	2073.95

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Government of Rajasthan
FOREST DEPARTMENT



भारतीय वन्यजीव संस्थान
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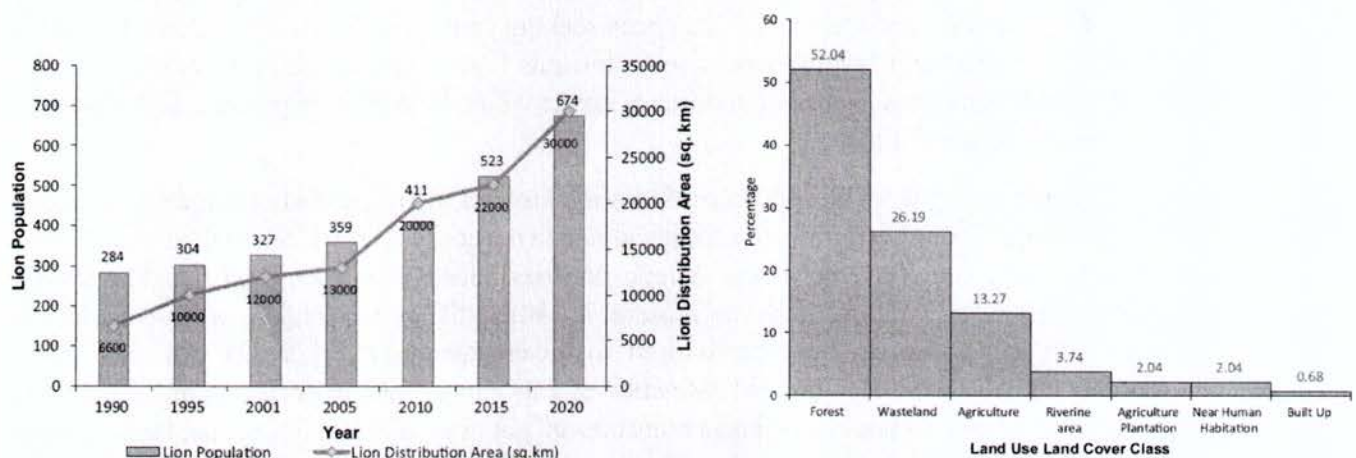
Project Lion

Project Proposal Developed by the Wildlife Institute of India in Consultation with Gujarat Forest Department

Introduction

India is the last home of the Asiatic lion (*Panthera leo persica*). After the initial efforts of the erstwhile rulers of Junagadh prior to India's independence the last 50 odd wild lions were saved from trophy hunting in the Gir Forests of Saurashtra. Lions were initially made the National animal of India after independence, the status which they subsequently lost to the tiger in 1973. Subsequently with the efforts of the government of Gujarat State and the Gujarat Forest Department, lions have since increased to around 674 occupying cumulatively about ~30,000 km² of human dominated landscape in Kathiawar peninsula (with sightings and kill recorded in areas spanning 9 districts over the years) (Figure 1). Honorable Prime Minister Shri Narendra Modi led celebrations when it was announced in June 2020 that Asiatic lion population in Gujarat had grown by almost 29% over the last five years. The Prime Minister himself shared this news with the nation and tweeted, "Over the last several years, the Lion population in Gujarat has been steadily rising. This is powered by community participation, emphasis on technology, wildlife healthcare, proper habitat management and steps to minimize human-lion conflict. Hope this positive trend continues!"

Figure 1: Growth of Asiatic lion populations during past 30 years & different land use land cover classes of Saurashtra landscape being currently used by lions (Source: Gujarat Forest Department)



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The conservation of the Asiatic lion in the greater Gir ecosystem is a conservation success story and largely the credit can be attributed to the people of Saurashtra who have a special cultural bond and extreme tolerance toward this large carnivore. However, with an increase in lion abundance and density and spread of lion occupied areas in the landscape, unique problems that were hitherto not experienced by conservation practitioners have emerged. A fresh approach that imbibes a thorough understanding of lion ecology, socio-economics of the local communities, and the development agenda of the region is required to ensure the continued persistence of the Asiatic lions in India.

Need and Rationale: Best Interest of the Species

Honorable Prime Minister, recognizing the best interest of Asiatic lions shared the Government's resolve and commitment to work for the long-term conservation from the ramparts of Red Fort in his speech on 74th Independence Day. The Prime Minister announced Project Lion for securing the future of Asiatic lions in the country.

The evolving scenario calls for even greater involvement of local communities in a range of activities including habitat augmentation and improvement, lion monitoring, shared usage of resources, man-animal conflict mitigation etc. for keeping this growing population healthy. The lions are now reaching in new areas where human settlements are predominant and the communities there, unlike peripheral areas of Gir forest, have not lived with lions in memorable past. In such a context, participatory management of the growing lion populations becomes imperative. Gujarat Forest Department has been seeking community participation in a big way in an attempt to reinforce a favorable perception towards lions and wildlife in general in minds of people in entire landscape. This is the primary aspect which is to be strengthened under the Lion Project over a period of time.

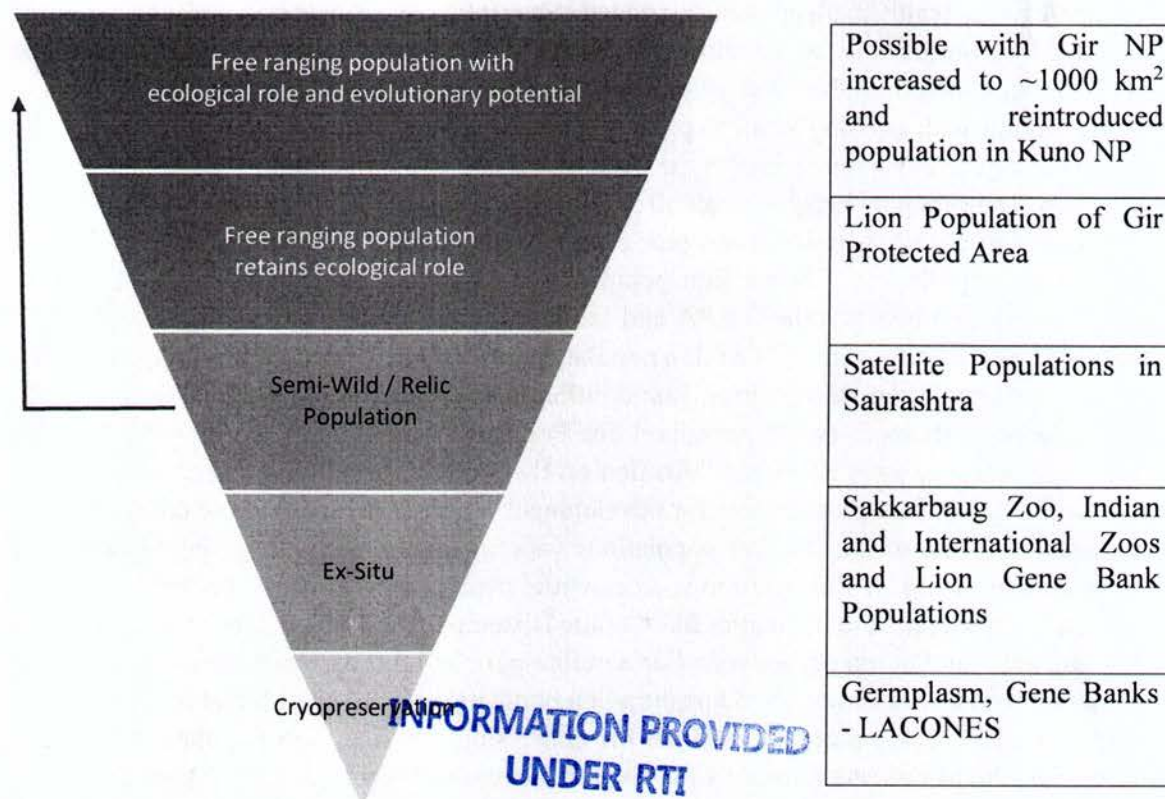
The ultimate goal of all species conservation projects including that of Project Lion should be to ensure that "Lions perform their ecological role in the ecosystem and retain their evolutionary potential". The ecological role of the Asiatic lion has been as an apex predator. Though this ultimate goal is what we should strive to achieve, it is often difficult to achieve in all scenarios and conservation goals have to be compromised to lower standards (Figure 2). All these lower conservation goals coalesce to prevent extinction of a species and are important cumulatively. The Gir Protected Area (PA) population and a reintroduced population in Kuno National Park (Madhya Pradesh) has the potential to achieve the ultimate goal, provided sufficient inviolate space is made available for lions in their protected habitat.

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Figure 2: Conservation objectives as an inverted pyramid signifying their relative importance. The ultimate conservation goal is to establish free ranging populations of lions that perform their ecological role as well as retain their evolutionary potential.



For the first time, the entire genome of Asiatic lion has been sequenced by scientists from CSIR-Centre for Cellular and Molecular Biology, Hyderabad. The full genome sequencing of Gir lions has shown them to be lacking genetic diversity in comparison to other lion populations and historical samples of Asiatic lions¹⁻⁴. The objectives of these studies are to understand the species at DNA level and study if there are any specific problems with regard to adaptability to environment or behavior vis-à-vis other big cats. It is a well-known principle of conservation biology that genetic diversity enhances adaptability to changing environmental (biotic and abiotic) conditions⁵. However, even genetically depauperate species can survive for the long-term (e.g. the cheetah⁶ and the Gir lions). An essential element for the survival of inbred species is the mechanism of purging deleterious genes through natural selection^{7,8}. It was suggested by several researchers time and again that the Asiatic lion may have low genetic diversity index and it is a concern in the long-term conservation of Gir lions⁹. Genetic studies and demographic management of populations may be guiding principle for further conservation of the Asiatic lion.

Further, in recent times, with increasing population, changing population dynamics and expansion of the territory, the overall health scenario of this population is also a cause of concern and science driven health management is needed. Susceptibility to diseases and chance of an epidemic type of outbreak is to be addressed through this project. This can and needs to be combated through demographic and genetic management of the lion population as a meta-population. Along with existing satellite populations, other free ranging populations need to be established. The gene exchange to enrich the existing genetic diversity among these population is to be taken up. The genepool program may offer solutions to infuse variations. Several populations will also act as a safety net against catastrophic events like epidemics or natural calamities that can wipe out single populations. Current lion population in Saurashtra is one big gene pool, with individuals exchanged between the Gir PA and satellite populations on a regular basis as shown by satellite-GPS-telemetry study ¹⁰. The lion population of the Gir PA being the source population and the satellite populations being sinks. Immigration is an essential element for the survival of these satellite populations ¹¹ (see Appendix 1 for Population Viability Analysis - PVA). With infrastructure, urban sprawl and industrialization on the increase, it is important to identify lion dispersal routes and ensure green norms for development projects traversing these corridors so as to safeguard the future of the satellite populations which cannot exist without immigrants. For satellite population viability immigration is an essential demographic process, but this makes the entire landscape susceptible to epidemics like Canine Distemper and Rabies. Since the intervening human dominated habitat matrix between lion satellite population teems with domestic and feral animal vectors for these diseases, the Saurashtra lion population would be vulnerable to epidemics that can cause catastrophic mortality and put the entire single Asiatic lion population at risk of extinction. This threat was recognized by the Gujarat Government through a PHVA analysis done under the leadership of the eminent conservation scientist Dr. Ulysses Seal, senior Forest Officials of Gujarat and wildlife biologists at Baroda in 1993 ¹². The Hon'ble Apex Court of India passed a land-mark judgement in 2013 mandating the Ministry of Environment Forests and Climate Change, GoI, Government of Gujarat and Government of Madhya Pradesh to work together and establish a reintroduced lion population in Kuno Wildlife Sanctuary, Madhya Pradesh. Progress towards this has been made on the principles laid down by the IUCN guidelines (2013) for reintroductions and the third draft action plan prepared by the expert panel appointed by the Hon'ble Supreme Court is under consideration by the three governments.

Goal of the Project Lion:

Asiatic Lions Should Play Their Ecological Role and Retain Their Evolutionary Potential. The Future Generation of Indians should be Proud of Their Natural Heritage which will be Preserved as Nature intended it to be.

Objectives

1. To manage growing lion populations in Gujarat.

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2. To ensure that local communities, people of Saurashtra and of India are the main stakeholders and benefitted by Project Lion and Lion conservation
3. To secure and manage lion habitat and mitigate human-lion conflict
4. To avert any risk of extinction to Asiatic lions and ensure their perpetuation for generations to come

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Proposed Activities

Habitat and Population

- 1) Create inviolate space for lions within Gir PA. Large carnivores need vast areas for viable populations and for this reason they serve as umbrella species for biodiversity with the Protected Area designed for their conservation. For Tiger Conservation the mandate of National Tiger Conservation Authority is to have an inviolate space of 800-1000 km² as core area for a tiger reserve and with a buffer of another 800-1000 km². It is within this human free core where tigers perform their ecological role. Currently, the only exclusive space for lions is the 250 km² of the Gir National Park. The rest of the range of the Asiatic lion is shared with people and the lion population subsists of human subsidies. It is important that Project Lion restores sufficient exclusive lion habitat of about 1000 km² through incentivized voluntary relocation of forest villages and Maldhari (local pastoral communities) settlements from within Gir Conservation Areas so that the only surviving Asiatic lion population gets the space it requires for performing its ecological role. The Maldharis living within Gir PA make a 75% higher profit compared to Maldharis living outside the PA due to free access to grazing, sale of manure with topsoil, and compensation for predated livestock ¹³. Therefore, an appropriately lucrative rehabilitation package for incentivized relocation would need to be worked out and offered to all forest dwellers within the core zone to relocate outside with hand holding and additional perks which may be available from the Gujarat State Government.

Time frame: 5-10 years; Responsibilities: Gujarat Forest Department, Madhya Pradesh Forest Department and Rajasthan Forest Department

- 2) Habitat improvement and augmentation is crucial to manage the growing population in a variety of land use and land cover categories. Besides managing and augmenting the habitat in the protected areas as per management plan, restoration of grasslands (reserved and non-reserved), development of peripheral forests as ideal habitat, securing shelter belts and refuge patches, lion corridor development and incentive driven lion friendly management in eco-sensitive zone is the key to maintain the thriving population of Asiatic lions. This should be the focus of the Lion project in times to come. Due to overgrazing by livestock many of these habitats are degraded and infested with invasive weeds and shrubs like *Lantana camara*, *Cenchrus ciliaris*, and *Prosopis juliflora* ^{14,15}. The habitat improvement and augmentation efforts in areas other than protected areas must be dovetailed with direct and indirect benefits to the local communities by mechanisms such as sharing of proceeds, grass etc. Project Lion will address these management activities.

Time frame: On a continuous basis. Responsibilities: Gujarat Forest Department, Madhya Pradesh Forest Department and Rajasthan Forest Department

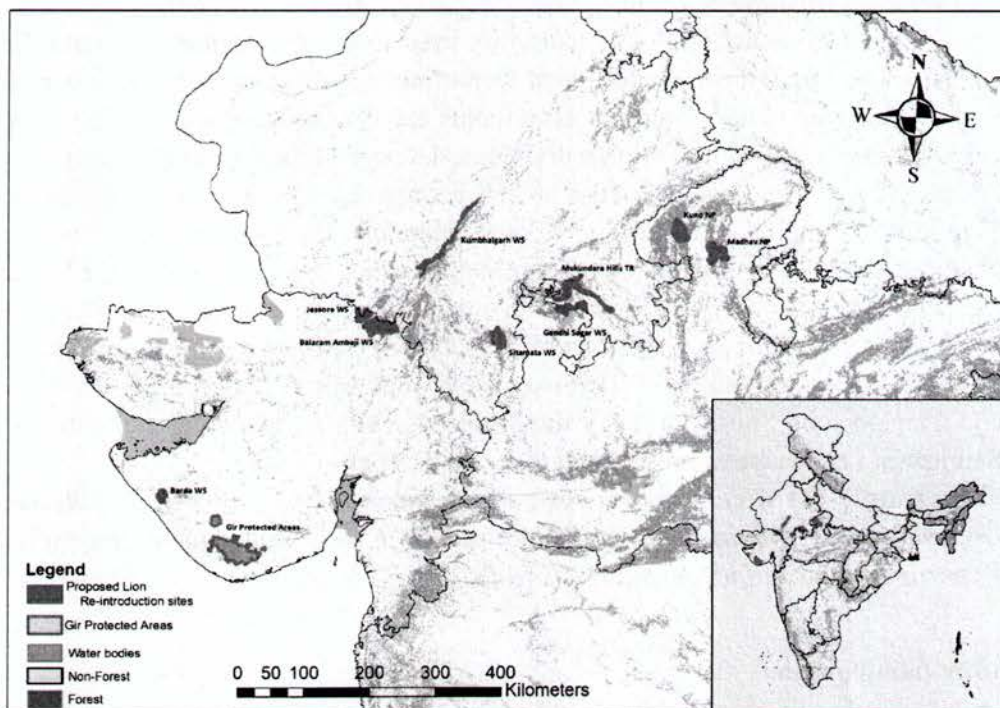
- 3) Create additional safety net free ranging populations within Gujarat and in India. The Barda Wildlife Sanctuary has been identified and assessed by the Wildlife Institute of India as a potential site where a population of 40 lions can be accommodated in the larger landscape of Barda-Alech hills and coastal forests ¹⁶. Investments for incentivized voluntary

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relocation of Maldhari families from within Barda WLS needs to be done under Project Lion. The Barda Maldharis are willing to relocate and a good incentive will free the wildlife sanctuary for lion reintroduction¹⁶. The other such potential sites may be further explored and progress may be made as per IUCN guidelines (Figure 3; see Appendix 2 for other sites within Gujarat and in other States). As per the Hon'ble Apex Court's order good progress has been made for reintroduction of lions to Kuno National Park, with Madhya Pradesh declaring the entire Kuno WLS and Wildlife Division as a National Park (750 km²) devoid of humans which is larger than the current Gir National Park (250 km²) (see Appendix 3 for a comparison between Gir and Kuno).

Time frame: 5-10 years; Responsibility: Gujarat Forest Department, Madhya Pradesh Forest Department, Ministry of Environment Forest and Climate Change GOI, and Wildlife Institute of India.

Figure 3: Potential sites in Gujarat and elsewhere in India for establishing alternative populations of Asiatic lions



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- 4) After establishing such lion populations these populations would be managed as a meta-population after disease and genetic studies of individuals to manage the demography in light of the lower genetic diversity in this subspecies of lions. With the current understanding based on full genome sequencing of all representative lions from across their range as well as historical samples ^{3,4}, the Gir lions along with Central and West African lions have been renamed as *Panthera leo leo*, while the east and southern African lions have been named as *Panthera leo melonochaita* ¹⁷. The Asiatic lions have close genetic affinity with extant West African and Central African lions. However, these west and central African lion populations are under severe threat of extinction and the Gir lions can potentially play a significant role in rescuing these lion populations in the future. Genetic rescue has been successfully done in the Florida Puma (*Puma concolor coryi*, ¹⁸) and is likely to be necessary for some lion populations across their range in Africa and India ¹⁹.

Time frame: On a continuous basis. Responsibility: Gujarat Forest Department, Madhya Pradesh Forest Department, Ministry of Environment Forest and Climate Change GOI, and Wildlife Institute of India.

- 5) Traditional total count method is currently used to estimate status of Asiatic lions every five years by the Gujarat State Forest Department. Total counts are rarely possible in a free ranging population since not all animals are detected and often it is not possible to avoid double counts of the same individuals. These shortfalls of total counts are explicitly addressed by WII with a robust scientific approach to estimate abundance through individual animal identification ^{20,21} and technique such as spatially explicit capture recapture (SECR) ²². The National Tiger Status evaluation carried out by the National Tiger Conservation Authority (NTCA)-WII in collaboration with State Forest Departments is a holistic assessment of prey, other carnivores, habitat and anthropogenic impacts along with tiger population estimation ²³. This exercise provides information that is useful for policy and management. Similar strategy should be adopted for evaluating the Status of Lions in Saurashtra Landscape at present and other landscapes in future.

Time frame: On a continuous basis at an interval of every 4 years. Responsibility: Gujarat Forest Department, Madhya Pradesh Forest Department, Rajasthan Forest Department and Wildlife Institute of India.

Community participation

- 1) Community participation and making them the stake holders is vital. The communities have a sense of pride and responsibility. This overarching sense needs to be converted into an information-sharing and monitoring mechanism. Public outreach is the key. Under its Vanyaprani Mitra (friends of wildlife) scheme, Gujarat Forest Department engages local youths who share intelligence about movement of wildlife and also act as a bridge between forest department and local communities. Currently, around 400 Vanyaprani Mitras are engaged and the Forest Department gives them honorarium. The scope of this scheme to more villages in lion landscapes of Gir and elsewhere may be expanded. Communities needs to be sensitized about the upcoming challenges of the growing lion population. The

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Project Lion will engage village Panchayats and encourage farmers to manage their land in a lion friendly manner to promote more space for wildlife in a rapidly developing landscape.

Time frame: On a continuous basis. Responsibility: State Forest Departments.

- 2) Supporting livelihoods is key element in winning community support. The proposed eco-tourism zones in the current Management Plan at Chikhalkuba and Girnar may be further developed so that local livelihoods from these regions can be benefitted. Similar eco-tourism as per prevailing guidelines and policy may also take up in newer areas.

Time frame: On a continuous basis. Responsibility: Gujarat Forest Department.

Management of Disease and Epidemics

- 1) Overall health and well-being of this endangered sub-species is crucial. Recent incidences of CDV and Babesiosis-related deaths of lions underline the gravity and urgency. Keeping in mind the natural processes of purging deleterious alleles, disease ecology and epidemiology; healthcare of lions will be very selective as per the advice provided by the best global experts from veterinary, genetics, and ecological fields to avoid any detrimental impacts on free ranging wild populations. A standard operating procedure (SOP) in the line of NTCA SOP on dealing with orphaned/abandoned tiger cubs and treating old/sick/injured individuals may also be developed for lions under Project Lion. The existing infrastructure and logistics need to be strengthened.

Time frame: On a continuous basis. Responsibility: Gujarat Forest Department, Ministry of Environment Forest and Climate Change GOI, Wildlife Institute of India, Indian Veterinary Research Institute (IVRI) and International Experts.

- 2) Disease Profile and Ecology in the Greater Gir Landscape as well as in other reintroduction sites: Understanding the profile of all pathogens, their hosts and epidemiology in relation to wildlife and domestic livestock is essential for prophylactic management of potential epidemics. This study along with vaccination of domestic and feral animals will be undertaken within the Saurashtra landscape and other potential reintroduction sites. Further, disposal of cattle carcass must be streamlined with support from panchayats, panjrapols and gaushalas. Standard operating guidelines for the above aspects is the need of the day for containing the transfer of any pathogen/diseases from livestock or stray dogs to wild animals. This way of transfer of diseases and addition of pathogenic load in the wild needs to be checked. Interventions in the form of treatment to wildlife including lions will be kept to a minimum and only when required and advised by scientists.

Time frame: On a continuous basis. Responsibility: IVRI, WII in collaboration with state forest departments.

Human-Wildlife Conflict

- 1) Increase in number of lions also means increased human lion conflicts in addition to other human-wildlife conflicts (Figures 4 & 5). Besides effective compensation regime what is needed is extension of human-wildlife conflict mitigation measures. Especially with

regards to farmers, the Forest Department has started providing machans (watch stations for crop protection) which is a very welcome scheme among farmer communities. This along with other mitigation solutions like pulsating temporary power fencing, insurance schemes for crop and livestock damage, needs to be explored and extended under Project Lion. Crop raiding by wild ungulates is another equally important cause of wild animal conflict with local communities. Effective mitigation measures must be explored suitable for safe repulsion from farmlands and implemented.

Time frame: 5 years and then on a continuous basis. Responsibility: Gujarat and other State Forest Departments

Figure 4: Intensity of livestock depredation by lions in the Saurashtra Landscape.

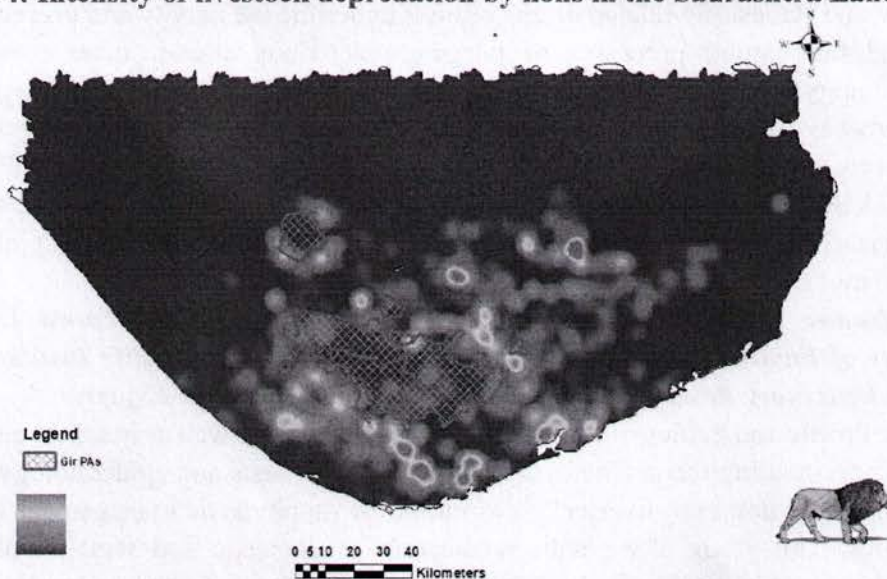
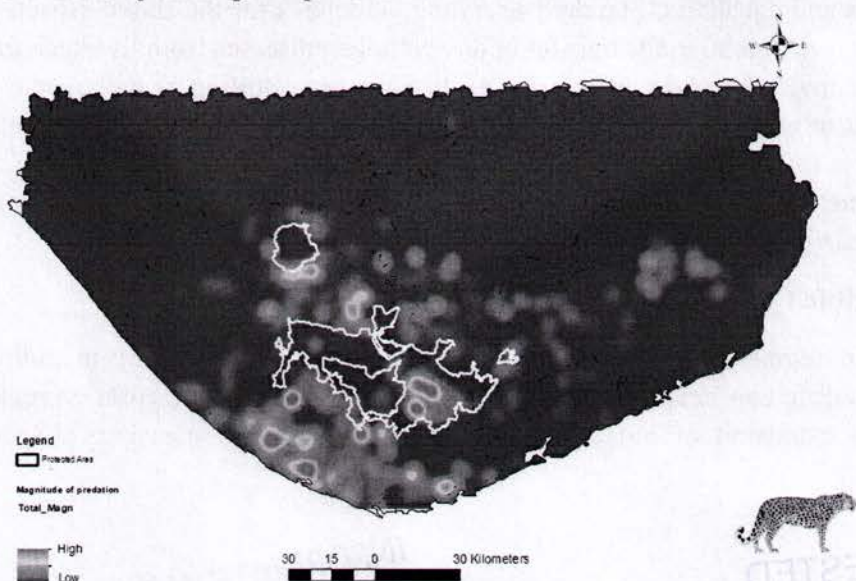


Figure 5: Intensity of leopard predation on livestock in Saurashtra Landscape.



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- 2) Strengthening of quick response teams for mitigating conflict across current and setting up new teams in potential lion habitat. Four-wheel drive vehicles equipped with darting and capture equipment, wildlife capture trained veterinary officer and his team will be deployed at strategic locations to address human-wildlife (lion/leopard) conflict and rescue.

Time frame: 1 year for strengthening and then on a continuous basis. Responsibility: State Forest Departments

- 3) Reproductive control of certain wildlife species like leopards in pockets where they are over abundant may be required to reduce their population growth and density. More human lives are lost to leopard attacks than tigers and lions combined in India. Many ungulate species like nilgai and wild pigs have become locally abundant and are responsible for large economic losses to farmers creating hostility towards Protected Areas. Immuno-contraception and chemical contraception options that are humane ways to reduce fecundity of these animals will be promoted on an experimental research basis by Project Lion in human dominated landscapes.

Time frame: On a continuous basis. Responsibility: Wildlife Institute of India, and subsequently State Forest Departments

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Surveillance and monitoring

- 1) The Gujarat Forest Department aims to keep in line with the latest and state of the art technology. The Gir Hi-Tech Monitoring Unit, Sasan-Gir is one such of the many initiatives. The Gir Hi-Tech Monitoring Unit, Sasan-Gir was started on June 11, 2019 to continuously monitor the movement of radio-collared Asiatic Lions and field staff in the Asiatic Lion Landscape. The Gir Hi-Tech Monitoring Unit monitors various managerial segments in the Asiatic Lion Landscape 24*7. A Forest Management Information System with an easy Graphical User Interface called e-GujForest has also been developed by the Gujarat Forest Department which helps in recording observations regarding wildlife protection and in mapping them for further use in devising management strategies. Virtual geo-fencing has also been established in probable conflict sensitive areas to monitor the movement of radio-collared Asiatic Lions in those areas. On ground patrols of staff and their live monitoring is also being done using technology. The existing software and hardware infrastructure is to be further strengthened and maintained. Implementation of MSTRIPES, a program developed by WII in collaboration with NTCA for monitoring tiger reserves and landscapes of India, should be explored to other potential lion reintroduction sites. The program can be customized for particular sites by incorporating relevant points for lion conservation.

Time frame: On a continuous basis. Responsibility: WII & Gujarat Forest Department initially and then by other state forest departments

- 2) Unlike tigers, lions do not have explicit body markings for individual identification. However, each lion has a unique pattern of whisker spots ^{20, 21} and the WII has already developed a software "Program Lion" ²⁴ that allows detailed history of each individual lion to be stored, compared, analyzed and used for population estimation, understanding long-

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term demographic parameters and for monitoring. A Lion database to store all relevant information related to population, movement, health etc. is a need of the day. The same will be developed under this Lion project.

Time frame: 2 years and then on continuous basis. Responsibility: WII & Gujarat Forest Department initially and then by other state forest departments

Research

Research into population genetics, population monitoring, human-wildlife conflict, disease dynamics and ecology of lions, co-predators, ungulates and socio-economies of local communities will be undertaken under the ambit of Project Lion. An understanding of ecological and social carrying capacity of the Saurashtra and other potential reintroduction sites will be obtained from this research for better management of lions and their ecosystem.

Time frame: On a continuous basis. Responsibility: WII, IVRI, Other scientific institutions and universities in collaboration with the state forest departments.

Information Education and Communication

Regular press releases and reports would be made during the execution of the project at field sites of the project and also at regional and national level. An information cell will be developed. The official's in-charge of interaction with the media would be clearly identified, so that information flow may happen without any ambiguity. Every effort would be taken to ensure that the media gets an opportunity to understand the project and its implementation with clarity. IEC material will also be developed for community sensitization and awareness.

Time frame: On a continuous basis. Responsibility: MoEFCC, Gujarat Forest Department and State FDs

Manpower

With an aim of providing technical assistance to MoEFCC to achieve the objectives of Project Lion at national scale, a Lion Cell in the line of NTCA Tiger Cell & MoEFCC Elephant Cell may be established based at MoEFCC, Delhi and WII, Dehradun. The Cell should be manned by scientists having expertise in wildlife biology, conservation ecology, GIS and veterinary science.

Time frame: On a continuous basis. Responsibility: MoEFCC & WII

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Monitoring and Advisory Committee

Monitoring and stock taking is key to the project. A National Supervisory and Advisory Committee would be constituted chaired by Director General of Forests, members as CWLW's of Gujarat, Madhya Pradesh, and Rajasthan (added as required by potential reintroduction sites); Director WII, two lion biologist experts and one IVRI scientist, member secretary as Additional Director General (wildlife). A local monitoring committee is proposed for operationalizing state level management under the Chairmanship of Chief Wildlife Wardens of the respective States wherein Inspector General (Wildlife) MoEF&CC, Govt. of India, Representative of Wildlife Institute of India, Indian Veterinary Research Institute, National Institute of Virology, and local bodies such as those for Gujarat can be Gujarat Biotechnology Research Center, CCF-Wildlife Junagadh Circle, Deputy/Additional Secretary- Wildlife, Government of Gujarat will be the members. Other invited members may be taken aboard by the Chairman and committee. These committees will monitor and assess the deliverables under the Lion Project and will advise on related matters.

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Budget Proposal: The budget estimates (in crores, Indian Rupees) are proposed for the next 10 years.

Budget for Gujarat Forest Department

Item	Activity	Unit	Rate	Amount (Rs. in Crore)											Remarks
				1st Year	2nd Year	3rd Year	4th Year	5th year	6th Year	7th Year	8th Year	9th Year	10th Year	Total	
Habitat and Population															
	A. Inviolate space for lions : relocation / resettlement of maldharis in existing PA (Gir and Barda)	2500 Families	20 Lakh per Family	100	100	100	100	100	-	-	-	-	-	500	Relocation process may spill over upto 10 years since process is time consuming
	B. Wildlife habitat rejuvenation / reclamation in relocated areas.	LS	LS	-	1	1	1	1	2.5	2.5	2.5	2.5	2.5	16.5	
	Habitat Improvement and augmentation (PA & outside PA) - Restoration of Grassland, Development of peripheral forests as ideal habitat, securing shelter belts & refuge patches	50000 Ha. 10000 Ha. Per year	Rs. 10000 Per Ha., 5000 Ha per year Maint. from Next Year	10	15	15	15	15	2.5	2.5	2.5	2.5	2.5	82.5	With maintenance works from 5th to 10th year

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	Lion Corridor development, incentive driven lion friendly management in eco-sensitive zone (Development of Riverine / Non Riverine Corridor)	LS	LS	10	10	10	10	10	10	10	10	10	10	100	
	Vegetation manipulation (thinning / decongestion / pollarding etc.) in PA areas.	5000 Ha. 500 Ha. Per Year	Rs. 60000 per Ha.	3	3	3	3	3	3.25	3.25	3.50	3.50	3.50	32	
	Water augmentation in Lion habitat	LS	LS	2.5	2.5	2.5	2.5	2.5	3	3	3	3	3	27.5	
	Create additional safety net free ranging populations (Barda)	LS	LS	10	5	5	5	5	2.5	2.5	2.5	2.5	2.5	42.5	After relocation or establishment or dispersal of Lion to Barda PA
	Managing Meta-populations : other Sites (Study / preparatory works)	LS	LS	2	2	2	2	2	2	2	2	2	2	20	
	Infrastructure for field staff														
	Protection chowky/ Thana/ field staff quarters etc. & maintenance	LS	LS	10	10	10	10	10	5	5	5	5	5	75	

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	Patrolling / protection infrastructure Maintenance & Development														
	Patrolling road maintenance / Development	LS	LS	10	10	10	10	10	10	10	10	10	10	100	
	Fire Control & related infrastructure	LS	LS	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5	12.5	
Communities	Community Participation and making them stakeholders														
	Information sharing and monitoring mechanisms (Viz. Vanyaprani Mitra)	500 Persons	Rs. 2500 Per month Per person	1.5	1.65	1.82	2.00	2.20	2.42	2.66	2.92	3.22	3.54	23.91	With 10% increase in wages / stipend from 2nd year onwards
	Public outreach and sensitization programme	LS	LS	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	75	
	Engaging peoples to have lion friendly management of their land & securing / purchase private lands (Seed money)	LS	LS	75	50	30	30	30	30	30	30	30	30	365	
	local livelihoods through ecotourism and other allied activities	LS	LS	5	5	5	5	5	5	5	5	5	5	50	

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	Entry point activities / Eco-development activities in new lion area	LS	LS	5	5	5	5	5	5	5	5	5	5	50	
Lion Health Management															
	A. Purchase of New Ambulance	10 Nos.	LS	5	-	-	-	-	-	-	-	-	-	5	
	B. Operation & Maintenance including old ones	LS	LS	-	1	1	1	1	1.5	1.5	1.5	1.5	1.5	11.5	
	strengthening of existing infrastructure and logistics & New treatment / transit facilities with maintenance	LS	LS	25	20	20	15	15	10	10	10	10	15	150	
Human Wildlife Conflict	Mitigation and adaptation measures														
	Manchan coverage in Lion / Leopard areas for farmers	35000 Manchan 3500 Beneficiaries per Year	Rs. 20000 Per Manchan	7	7	7	7	7	7	7	7	7	7	70	
	Protection / parapet wall for open well	15000 Nos. 1500 Well per year	Rs. 16000 Per well	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	24	
	Quick response teams	40 Teams													

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	A. HR through outsourcing / Contract (Trekkers, Labour, Animal keeper, Worker)	160 Labours	Rs. 13500 Per person per month	2.6	2.86	3.15	3.46	3.81	4.19	4.61	5.07	5.57	6.13	41.44	With 10% increase in wages / stipend from 2nd year onwards
	B. Driver through outsourcing / Contract for response team / Ambulances	50 Persons	Rs. 13500 Per person per month	0.81	0.891	0.98	1.08	1.19	1.30	1.43	1.58	1.74	1.91	12.91	With 10% increase in wages / stipend from 2nd year onwards
	C. Veterinary Officers	10 Persons	Rs. 50000 Per Person Per month	0.6	0.66	0.73	0.80	0.88	0.97	1.06	1.17	1.29	1.41	9.56	With 10% increase in wages / stipend from 2nd year onwards
	D. Engaging Livestock Inspector	10 Persons	Rs. 18000 Per Person Per month	0.216	0.2376	0.26	0.29	0.32	0.35	0.38	0.42	0.46	0.51	3.44	With 10% increase in wages / stipend from 2nd year onwards
	Other related Misc. Activities	LS	LS	5	5	5	5	5	5	5	5	5	5	50	For contingency population estimation and other related miscellaneous activities
Surveillance and monitoring	Strengthening of existing software and hardware infrastructure & maintenance there after	LS		5	2.5	2.5	2.5	2.5	1.5	1.5	1.5	1.5	1.5	22.5	
	Engaging IT Engineers	4 Persons	Rs. 35000 Per Person Per month	0.168	0.185	0.20	0.22	0.25	0.27	0.30	0.33	0.36	0.40	2.68	With 10% increase in wages / stipend from 2nd year onwards
	GIS specialist	3 Persons	Rs. 45000 Per	0.162	0.178	0.20	0.22	0.24	0.26	0.29	0.32	0.35	0.38	2.58	With 10% increase in

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			Person Per month												wages / stipend from 2nd year onwards
	Data Operator	10 Persons	Rs. 13500 Per person per month	0.162	0.178	0.20	0.22	0.24	0.26	0.29	0.32	0.35	0.38	2.58	With 10% increase in wages / stipend from 2nd year onwards
	Rescue Vehicle (Purchase / Contract) & maintenance charges of vehicles including fuel.	LS	LS	2	2	2	2	2	2	2	2	2	2	20	
	Lion Database	LS	LS	2.5	0.5	0.5	0.5	0.5	1	1	1	1	1	9.5	
Research	Population genetics, population monitoring, lion ecology, disease dynamics	LS	LS	1	1	1	1	1	1	1	1	1	1	10	
	Strengthening of Leo Gene Lab	LS	LS	3	2	2	2	2	2	2	2	2	2	21	
	Engaging JRF/ SRF/ TA/ Research Assistant / Biologist	5 Persons	Rs. 35000 Per Person Per month	0.21	0.23	0.25	0.28	0.31	0.34	0.37	0.41	0.45	0.50	3.35	With 10% increase in wages / stipend from 2nd year onwards
Information, Education and Communication	Regular press releases, reports & IEC material and training	LS	LS	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	25	
	Information Cell	LS	LS	1	0.25	0.25	0.25	0.25	0.5	0.5	0.5	0.5	0.5	4.5	
				318.83	280.22	260.93	256.71	257.56	136.50	137.54	138.93	140.18	146.56	2073.95	

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Budget for National Level (outside of Saurashtra) Implementation of Project Lion

Component	Activity	Description	Amount (Rs. in Crore)											Agency to receive fund
			1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year	Total	
Preparation of sites for lion reintroduction		Resettlement of human habitations to create inviolate space, habitat reclamation, grassland development, fencing, livestock vaccination, infrastructure and capacity building, awareness and community participation												
	Madhav NP		30	30	30	30	30						150	MPFD
	Sitamata WLS		36	36	36	36	36						180	RFD
	Mukundara Hills TR		65	65	65	65	65						325	RFD
	Gandhi Sagar WLS		30	30	30	30	30						150	MPFD
	Kumbhalgarh WLS		55	55	55	55	55						275	RFD
	Jessore Balaram Ambaji WLS		66	66	66	66	66						330	GFD
Lion reintroduction in Kuno NP		Lion capture (drug, capture & immobilization equipment), lion transport cost, lion soft release facility at release site, additional compensation	15	15	10	10	10	10	10	10	10	10	110	MPFD
Lion translocation cost for other sites		Lion capture (drug, capture & immobilization equipment), lion transport cost, lion soft release facility at release site				10	10	15	20	25	25	25	130	GFD, MPFD, RFD, WII

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SECR based lion population estimation		A quadrennial exercise initially for Gujarat & thereafter for other sites	7			8				10			25	WII
Development & customization of Program LION and database for Gir, Kuno and other sites			1	1	1	2	2	2	2	3	3	3	20	WII
Implementation of MSTRIPES in Kuno & other sites		Customization of software, purchase of android phones, PC, laptops, server, training workshops	5	5	5	2	2	2	2	2	2	2	29	WII, State FDs
Development of tourism zone in Kuno & other sites		Master Plan, tourism infrastructures & Interpretation Centres	5	5	5	5	5	8	8	8	8	8	65	State FDs
Immunocontraception of leopards & other wildlife to mitigate conflict		Initially as a pilot project in Gujarat & subsequently in other states	5	5	5	5	5	8	8	8	8	8	65	WII, IVRI
Research														
	Saurashtra Landscape	Lion population genetics, population monitoring, human-wildlife conflict, disease dynamics and ecology of lions, co-predators, ungulates and socio-economies of local communities	2	2	2	2	2	2	2	2	2	2	20	WII

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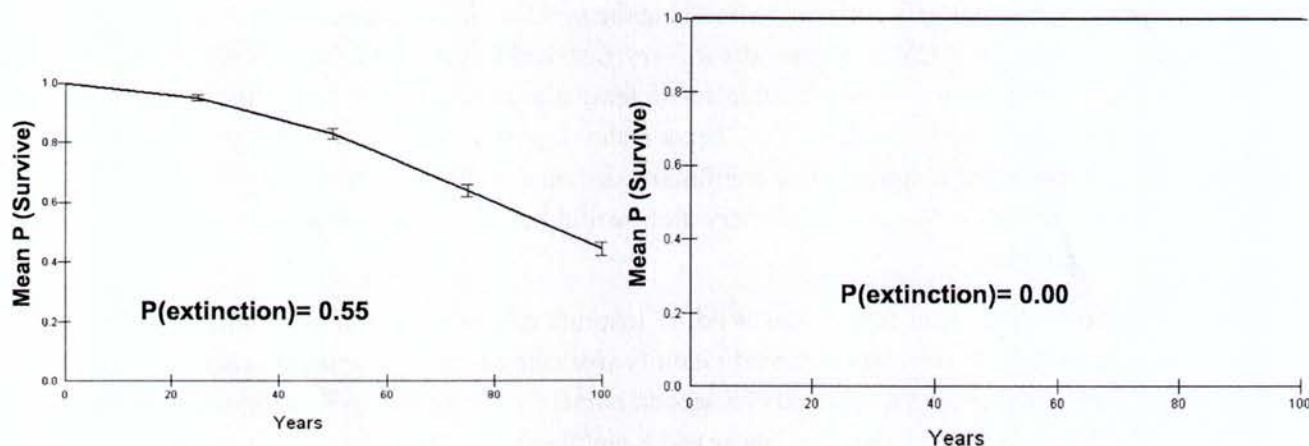
	Kuno	Ecological assessment & monitoring of Kuno Landscape as a potential site for lion reintroduction	2.5	2.5									5	WII
	Other potential sites	Ecological assessment of 6 sites for their potential for lion reintroduction	2	2	2								6	WII
Lion Cell at MoEFCC & WII		Salaries & other statutory benefits of 5-6 personnel, equipment, office expenses, operational cost, travel, Institutional liabilities etc. (with increase of salaries @ 10% per annum)	2.00	2.20	2.42	2.66	2.93	3.22	3.54	3.90	4.29	4.72	32	MoEFCC, WII
Information education and public outreach		For Kuno & other potential lion reintroduction sites	5	5	5	5	5	5	5	5	5	5	50	State FDs
Travel		International & domestic travel by MoEFCC, WII, IVRI, Lion Cell officials and international experts	1	1	1	1	1	1	1	1	1	1	10	MoEFCC, WII, State FDs
			334.5	327.7	320.4	334.7	326.9	56.2	61.5	77.9	68.3	68.7	1977	

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Appendix 1: Population Viability Analysis

Currently the only free ranging population of about 674 Asiatic lions (*Panthera leo persica*) exists in the Gir landscape (approximately 30,000 km²) comprising of the Gir Protected Area (PA), Girnar Sanctuary, coastal scrublands and human dominated landscapes of Saurashtra peninsula, Gujarat²⁵. Lions are currently surviving in this landscape as a metapopulation wherein Gir PA acts as a 'source' and other satellite pockets act as 'sinks' and individual lions from different breeding populations can potentially disperse among these populations. A Population Viability Analysis (PVA) was performed for small, isolated Girnar lion population and the results suggest that the Girnar lion population could potentially survive for the short to medium term (25-50 years, probability of extinction 5-10%) without immigrants. However, for long term (100 years) persistence connectivity with the Gir PA is crucial¹¹. Even if 1-2 lions immigrate from Gir to Girnar Sanctuary once in two years, extinction probabilities are reduced by 45% (Figure 1). Thus Girnar population of lions exists as a metapopulation sink in connection with the Gir PA and the corridor habitat should be restored and managed as 'eco-sensitive'.

Figure 1: Population Viability Analysis envisaging that for long term (100 years) persistence of Girnar lion population, habitat connectivity of Girnar Wildlife Sanctuary with the Gir Protected Area is crucial



With Immigration (at least 2 male lions & 1 female lion every alternative year from Gir PA)

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About 2,500 years ago, the Kathiawar peninsula was separated from the mainland India by rising sea level causing the first genetic bottleneck that isolated the founders of the present Asiatic lion population compelling them to inbreed for several generations⁹. A second less severe bottleneck happened at the onset of the nineteenth century when lions became restricted to the Gir forests and their number declined to around 50 individuals due to hunting and habitat loss²⁶. Allozyme and microsatellite studies indicate that the Asiatic lion population is genetically monomorphic, attributed to an isolated inbred population with a small founder base^{9,27}. Decreased heterozygosity likely diminishes reproductive vigor and survival and is believed to impair a population's long-term viability^{28, 29}. Moreover, inbred carnivore populations restricted to single sites (such as Asiatic lions) face a variety of extinction threats from genetic and environmental stochastic factors³⁰. Catastrophes such as an epidemic, an unexpected decline in prey, natural calamities or retaliatory killings could result in the extinction of a threatened species when it is restricted to a single site. It is worth recording that an epidemic caused by a morbillivirus closely related to Canine Distemper Virus (CDV) emerged abruptly in the lion population of the Serengeti National Park, Tanzania in early 1994 resulting in fatal neurological disease characterized by grand mal seizures and myoclonus; the lions that died had encephalitis and pneumonia³¹. Recent outbreak of Babesiosis and CDV in Gir has already resulted into mortality of at least more than 60 lions during past two years. As the world is currently witnessing the rapid spread of corona virus during COVID outbreak, similarly, the CDV can also spread very fast within the entire lion population of Gir especially when containment is not possible due to feral animal vectors in a landscape that remains connected for disease transmission. This necessitates urgency for establishing geographically distant and distinct populations of a minimum size and subsequently managed them as a metapopulation with Gir. *In-situ* lion conservation would benefit from as many such free ranging populations as possible.

One such potential site identified by the Wildlife Institute of India was Kuno Wildlife Sanctuary in Madhya Pradesh³². A population habitat viability workshop for the Asiatic lions held at Baroda in October 1993 also reiterated the need of a second home for the species in Kuno along with other sites such as Sitamata, Darrah-Jawahar Sagar and Kumbhalgarh in Rajasthan and Barda in Gujarat¹². A PVA model was parameterized for Kuno by WII based on lion demographic data obtained from the Gir lion population³³. With conservative and realistic lion population parameters, the PVA incorporating environmental, genetic and demographic stochasticity, suggests that the lions reintroduced in Kuno will have high probabilities of long-term population persistence. The salient features that permitted population persistence were a i) carrying capacity of over 45 lions, ii) introducing an initial population of a minimum of twelve individuals (5-7 breeding females and 2-3 breeding males) and iii) supplementation with a minimum of six individuals (two males and four females) every four year for the next 16 - 20 years. Even with this strategy long-term (> 200 years) lion persistence in Kuno requires a population of over 80 lions. This can be achieved by increasing the size of the Protected Area combined with an increase in prey abundance which will enhance the carrying capacity for the lions to the required level (20 - 25 years). The PVA models were extremely sensitive to loss of lions to human causes and therefore strict monitoring and protection

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are required during the initial years of lion reintroduction in Kuno till the population size exceeds 60 lions.

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Appendix 2: Additional potential sites for lion re-introduction

1. Madhav National Park:

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Area: 354.61 km²

State: Madhya Pradesh

Biogeographic zone: Semi-arid biogeographic zone, Gujarat-Rajputana biotic province 4B ³⁴

Vegetation Type: Tropical dry deciduous forest

Geography: Madhav National park is situated between 77° 15' to 78° 30' E and 24° 50' to 25° 55' N in the district of Shivpuri, Madhya Pradesh. The area of the National Park is 354.61 km² surrounded by the Vindhya range of mountains with an altitudinal difference of 360-490m from mean sea level ³⁵. The park is connected to Kuno-Palpur Sanctuary and serves as an important wildlife corridor in the landscape. The area falls under the semi-arid bio-geographic zone, Gujarat-Rajputana biotic province 4B ³⁴ and Kathiarbar-Gir Dry Deciduous Forests eco-region ³⁷. Terrain is undulating and characterized by gentle slopes, small rocky hills multiple nallahs and contains artificial lake inside the National Park (<https://natureconservation.in/>). The dry deciduous vegetation of the park is mostly dominated by *Anogeissus pendula*, *Lannea coromandelica*, *Grewia tilifolia*, *Boswellia serrata*, *Sterculia euren*s and *Acacia catechu*. The park also comprises flat grasslands around the reservoirs³⁸.

Prey-predator diversity: The major carnivore species includes Wolves (*Canis lupus*), Leopards (*Panthera pardus*), Sloth Bear (*Melursus ursinus*), Striped hyaenas (*Hyena hyena*), Golden jackal (*Canis aureus*), Indian fox (*Vulpes bengalensis*) and Wild Dog (Dhole) (*Cuon alpinus*). Among herbivores Sambar (*Rusa unicolor*), Spotted deer (*Axis axis*), Barking deer (*Muntiacus vaginalis*), Indian Gazelle (*Gazella bennettii*), Nilgai (*Boselaphus tragocamelus*) and Wild pig (*Sus scrofa*) are common ^{35,39}.

Climate: The landscape experiences a sub-tropical climatic condition with extremely hot summer and relatively moderate winter. Winter ranges from November to February, summer ranges from March to June and rainy season starts from mid-June and continues up to September. The average annual temperature varies between 4°C in winter and 45°C in summer. The average annual rainfall in the landscape ranges between 1000 mm to 1250 mm ³⁸.

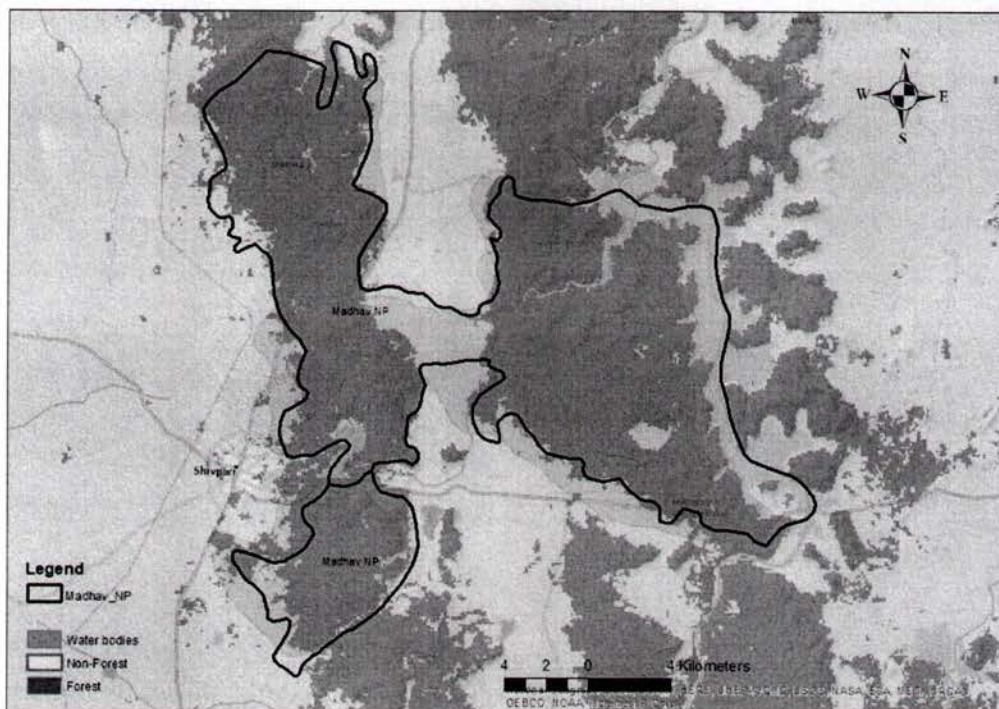
Anthropogenic pressure: About 130 villages surrounding with 10 km radius from the National Park and only one village is situated within. There is high pressure of both timber and non-timber forest product collection by the villagers

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Priority and immediate management interventions needed:

The landscape of Madhav National park which have good connectivity with Kuno National Park creates an area of more than 3000 km² with good forest and less biotic pressure compared to other protected forests proposed herewith for lion re-introduction. There is ample space for lions to disperse from Kuno or vice-versa. Therefore, this landscape is on top of the priority list. However, to make it conducive for lion conservation some immediate management inventions need to be implemented, such as, resettlement of remaining villages from the protected area, habitat improvement, eradication of weeds, infrastructure development to reduce human-large carnivore conflict such as power-fencing and livestock vaccination to prevent disease spread from domestic animals.



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Figure 1: Madhav National Park, Madhya Pradesh

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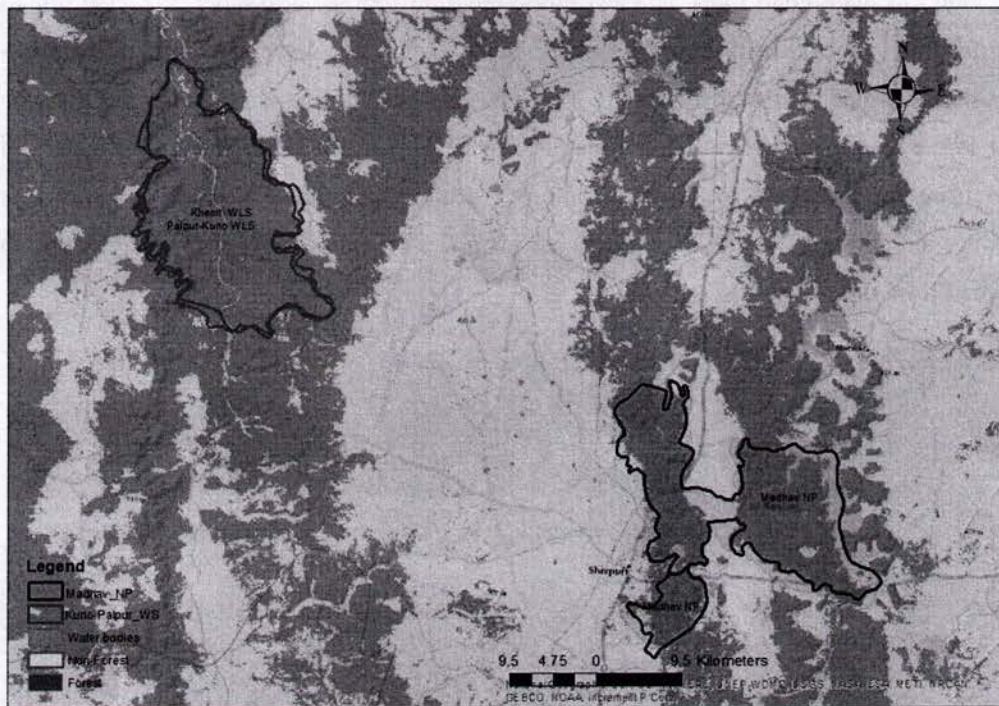


Figure 2: Madhav National Park and Kuno-Palpur Wildlife Sanctuary complex, Madhya Pradesh

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2. Sitamata Wildlife Sanctuary:

Area: 422.95 km²

State: Rajasthan, India

Biogeographic zone: Semi-arid biogeographic zone, Gujarat-Rajputana biotic province 4B³⁴

Vegetation Type: Tropical dry deciduous forest

Geography: Sitamata Wildlife Sanctuary is situated between 24° 04'-24° 23' N and 74° 25'-74° 40' E in the south-western part of Rajasthan State. It is spanning over an area of 422.95 km² in the districts of Pratapgarh and Chittaurgarh⁴⁰. It falls under the "semi-arid bio-geographic zone; Gujarat-Rajputana biotic province 4B³⁴ and Kathiwar-Gir Dry Deciduous Forests eco-region³⁷. The strategic location of the sanctuary at the junction of the Aravalli, Vindyan hill ranges, and Malwa Plateau creates a unique ecosystem for many fauna and flora. The landscape is characterized by gentle slopes, rugged and hilly terrains interspersed with network of river and streams, wetlands, natural deep gorges and fine grooves of mixed woodlands. The altitude ranges from 280m to 600m above mean sea level.

Prey-predator diversity: The sanctuary forms the north-western most limit of Teak-bamboo mixed forest and distribution limits of many animal species⁴¹. The sanctuary is known to support a great diversity of mammalian fauna including many carnivorous species such as Wolves (*Canis lupus*), Leopards (*Panthera pardus*), Striped hyaenas (*Hyena hyena*), Golden jackal (*Canis aureus*), Jungle cat (*Felis chaus*), Indian fox (*Vulpes bengalensis*), Honey badger (*Melivora capensis*), Small Indian civet (*Viverricula indica*), Common palm civet (*Paradoxurus hermaphroditus*) and Grey mongoose (*Herpestes edwardsi*) and Ruddy mongoose (*Herpestes smithii*). Among herbivores Hanuman langur (*Semnopithecus entellus*), Sambar (*Rusa unicolor*), Spotted Deer (*Axis axis*), Nilgai (*Boselaphus tragocamelus*), Four horned antelope (*Teracerus quadricornis*) and Wild pig (*Sus scrofa*)⁴⁰. Besides the sanctuary is rich with many other rare and endangered faunas such as Indian pangolin (*Manis crassicaudata*), Indian hedgehog (*Hemiechinus micropus*) and Indian Giant Flying Squirrel (*Petaurista ptilipensis*) etc.

Climate: The landscape experiences a sub-tropical climatic condition characterized by distinct winter, summer and monsoon season. Winter ranges from November to January, summer ranges from March to May and rainy season starts from mid-June and continues up to September. The average annual temperature varies between 6°C in winter and 45°C in summer and the average annual rainfall is about 756 mm with maximum up to 951 mm and minimum 517mm.

Anthropogenic pressure: There are about 193 villages and 14 Gram Panchayats inside the forest, mostly comprising of people from Meena and Bhil community. Of which about 8 Gram Panchayats comprising of 96 villages are within the core area. There are problems of encroachment, heavy grazing by domestic livestock, illicit cutting of wood, timber and bamboo along with other agricultural activities, ⁴¹, heavy infestation of weeds, poor prey base, lack of antipoaching strategies, many linear infrastructures cutting across the tiger reserve and poorly trained frontier forest staff, etc. ⁴².

Priority and management interventions needed:

The landscape of Sitamata Wildlife Sanctuary and adjoining forest patches with similar biotic and abiotic factors makes it a suitable for reintroduction of lions. However, at present the protected area experiences high anthropogenic pressure as mentioned above. About 11000 households are known to present within the sanctuary ⁴³. Therefore, to make the landscape conducive for lions we need to reduce anthropogenic pressure and create inviolate space by resettling villages from the park, create alternate livelihood opportunity for people, improve habitat quality, weed eradication, vaccination of livestock in the peripheral villages to stop disease spread to wild animals and infrastructure development for anti-poaching activities and to reduce human wildlife conflict.

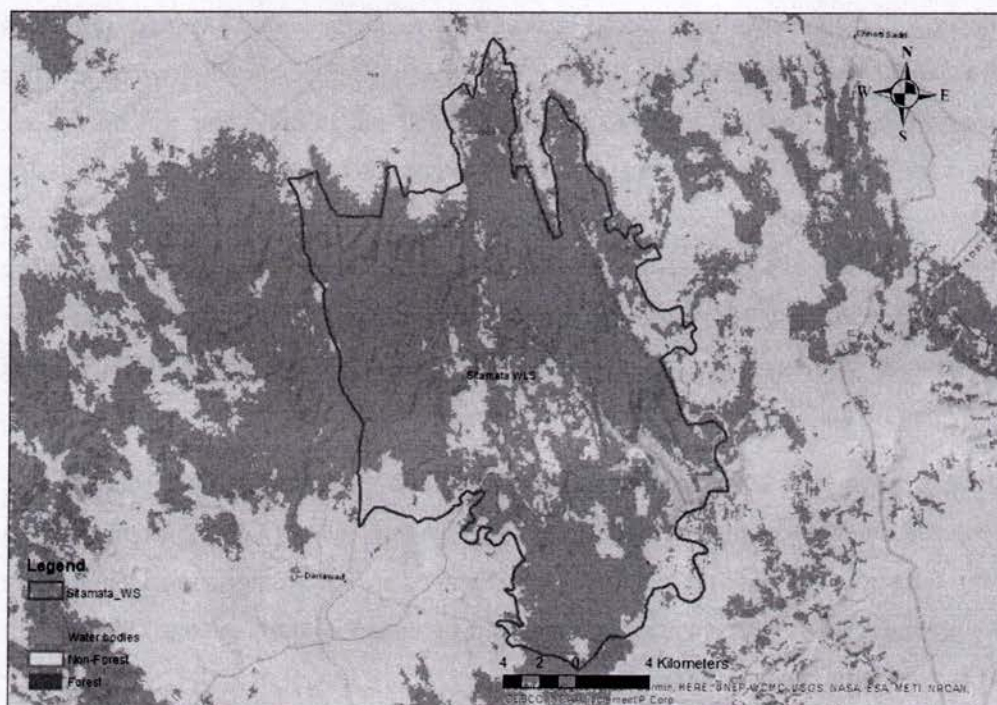


Figure 3: Sitamata Wildlife Sanctuary, Rajasthan

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3. Mukundara Hills Tiger Reserve:

Area: 759.99 km²

State: Rajasthan, India

Biogeographic zone: Semi-arid biogeographic zone, Gujarat-Rajputana biotic province 4B ³⁴

Vegetation Type: Tropical dry deciduous forest

Geography: Mukundara hills tiger reserve lies between 24° 38' to 25° 7' N and 75° 26' to 76° 11' E across four districts of Rajasthan namely Kota, Bundi, Chittorgarh and Jhalawar. It covers an area of about 759.99 km² of which 417.17 km² is designated as core and 342.82 km² is designated as buffer ⁴⁴. Located in the eastern bank of river Chambal, the tiger reserve consists of three wildlife sanctuaries, Darrah National Park, Chambal Wildlife Sanctuary and Jaswant Sagar Wildlife Sanctuary. The tiger reserve has connectivity with Ranthambore tiger reserve, Ramgadh Vishdhari and Bhainsarogar wildlife sanctuary. Further, it is also connected to the Gandhi Sagar wildlife sanctuary in Madhya Pradesh ²³. The area falls under the semi-arid bio-geographic zone, Gujarat-Rajputana biotic province 4B ³⁴ and Kathiarbar-Gir Dry Deciduous Forests eco-region ³⁷. The vegetation type is characterized by dry deciduous forest ⁴⁵ dominated by *Anogeissus pendula*, *A. latifolia*, *Acacia catechu*, *Ziziphus mauritiana*, *Flacouritia indica*, and *Acacia leucifloea*.

Prey-predator diversity: Although there are no tigers in the reserve, it harbors a great variety of carnivorous and herbivorous species. Carnivore species includes Wolves (*Canis lupus*), Leopards (*Panthera pardus*), Sloth Bear (*Melursus ursinus*), Striped hyaenas (*Hyena hyena*), Golden jackal (*Canis aureus*), Jungle cat (*Felis chaus*), Desert cat (*Felis margarita*), Indian fox (*Vulpes bengalensis*), Honey badger (*Melivora capensis*), Small Indian civet (*Viverricula indica*), Common palm civet (*Paradoxurus hermaphroditus*), Grey mongoose (*Herpestes edwardsi*) and Small Indian mongoose (*Herpestes javanicus*). Among herbivores Hanuman langur (*Semnopithecus entellus*), Rhesus macaque (*Macaca mulatta*), Sambar (*Rusa unicolor*), Spotted deer (*Axis axis*), Indian Gazell (*Gazella bennettii*) Nilgai (*Boselaphus tragocamelus*), Indian crested porcupine (*Hystrix indica*) and Wild pig (*Sus scrofa*) ²³.

Climate: The landscape experiences a sub-tropical climatic condition with extremely hot summer and relatively moderate winter. Winter ranges from November to February, summer ranges from March to June and rainy season starts from mid-June and continues up to September. The average annual temperature varies between 6°C in winter and 45°C in summer and the average annual rainfall is about 795 mm ranges from 600 mm to 990 mm ⁴⁶.

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Anthropogenic pressure: There are about 12 villages inside the park, dominant community is “Gurjars” whose principle occupation is livestock rearing and dependent on the forest for fuelwood and fodder⁴⁴. The landscape experiences many threats due to deforestation, over-grazing, encroachment of forest land, exploitation of forests resources and uncontrolled quarrying⁴⁷.

Priority and management interventions needed:

The complex of Mukundara Hills Tiger reserve and Gandhi Sagar Wildlife Sanctuary along with other adjoining forest creates an area of about 2000 km² which have great potential to develop it for lion conservation. At present, there are many villages inside the Mukundara Hills tiger reserve and have great anthropogenic impact on the ecosystem. Therefore, resettlement of villages from the park is of utmost necessity to create inviolate spaces for the lions to thrive. Further, to reduce the dependency of the villagers on the forest, it is important to create alternative livelihood opportunities. Intensive management interventions for habitat improvement, weed removal and anti-poaching activities are required. Strict law enforcement against illegal activities such as quarrying within the eco-sensitive zone of the PA need to be prohibited. Roughly there are more than 10,000 households within or in close proximity to the park⁴³.

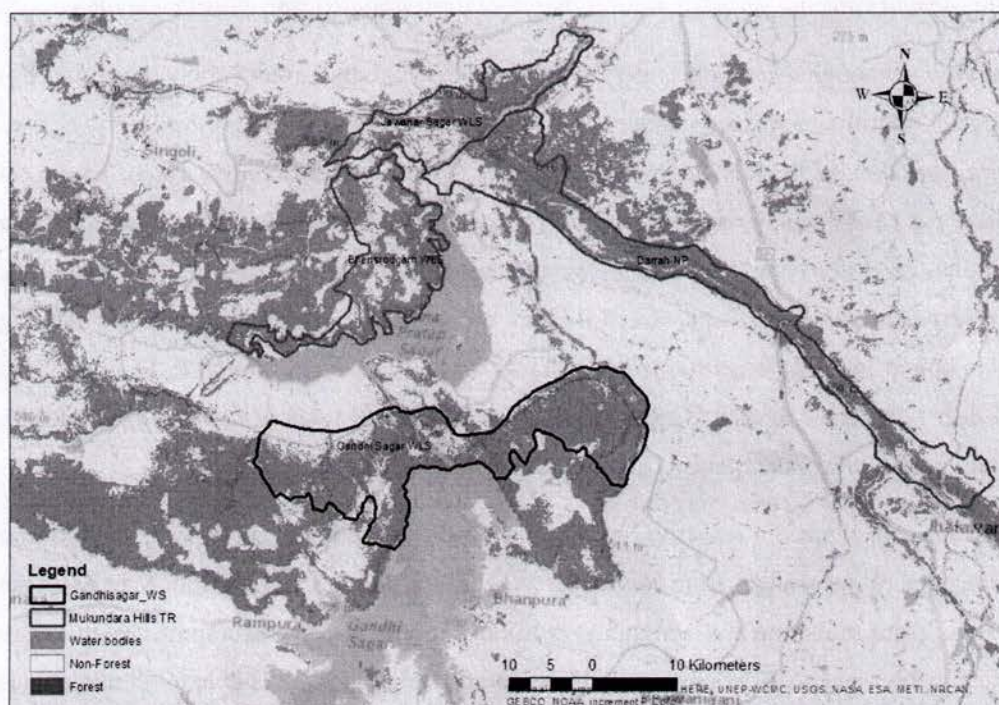


Figure 4: Mukundara Hills Tiger Reserve of Rajasthan and Gandhi Sagar Wildlife Sanctuary of Madhya Pradesh complex

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4. Gandhi Sagar Wildlife Sanctuary:

Area: 368.62 km²

State: Madhya Pradesh, India

Biogeographic zone: Semi-arid biogeographic zone, Gujarat-Rajputana biotic province 4B ³⁴

Vegetation Type: Tropical dry deciduous forest

Geography: Gandhi Sagar Wildlife Sanctuary is situated between 23° 45'-25° 2' N and 74° 42'-75° 50' E in the Malwa plateau of Madhya Pradesh. Spreading over an area of 368.62 km² the sanctuary is divided into two parts by the Chambal river running through it. The western part of the sanctuary falls in the district of Nimach while the eastern part is in Mandsaur district. The sanctuary is connected to Mukundara Hills Tiger Reserve of Rajasthan. The forests of the sanctuary can be broadly classified into (i) Northern tropical dry mixed deciduous forests [5B/C2]; (ii) Dry Deciduous Scrub Forests [5/DS1] and (iii) *Anogeissus pendula* forests [5/E1]⁴⁵. The Gandhisagar dam is one of the largest inland reservoirs in the country with a submergence area of 650 km², and there are good flat grasslands available around the submergence ⁴⁸.

Prey-predator diversity: Not much information available on the mammalian diversity of Gandhisagar Wildlife Sanctuary. However, there are reports in popular media about common sightings of Leopards (*Panthera pardus*), Striped hyaenas (*Hyena hyena*) and Golden jackal (*Canis aureus*). Besides, the park also harbors Wolves (*Canis lupus*), and this sanctuary is known to be one of the strongholds of Indian Wild Dog (Dhole) (*Cuon alpinus*). The most commonly sighted wild herbivores include Hanuman langur (*Semnopithecus entellus*), Sambar (*Rusa unicolor*), Indian Gazell (*Gazella bennettii*) and Nilgai (*Boselaphus tragocamelus*) ⁴⁹.

Climate: The landscape experiences a sub-tropical climatic condition with extremely hot summer and relatively moderate winter. Winter ranges from November to February, summer ranges from March to June and rainy season starts from mid-June and continues up to September. The average annual temperature varies between 10°C in winter and 43°C in summer and the average annual rainfall is about 795 mm ranges from 600 mm to 990 mm ⁴⁸.

Anthropogenic pressure: There are many religious tourism sites inside the wildlife sanctuary. Some of the famous attractions are Chaurasigarh, Chaturbhujnath temple, Bhadkaji rock paintings, Narsinghjar, Hinglajgarh Fort and Taxakeshwar temple ⁵⁰.

Priority and management interventions needed:

With good connectivity to Mukundara Hills Tiger Reserve in Rajasthan this landscape along with other adjoining forest patches creates an area of about 2000 km² of continuous forests and holds great potential for reintroduction of lion. There are about 530 households are known to be present within the sanctuary. Therefore, to reduce biotic pressure, religious tourisms needs to be regulated, mining or other development activities withing the eco-sensitive zone and along the habitat corridors need to be prevented. Habitat improvement, weed eradication, water management, grasslands management need to carryout. Vaccination of livestock around the park is important to prevent disease transmission to wild animals. Alternative livelihood opportunity creation is necessary to reduce dependency of villagers on forest product.

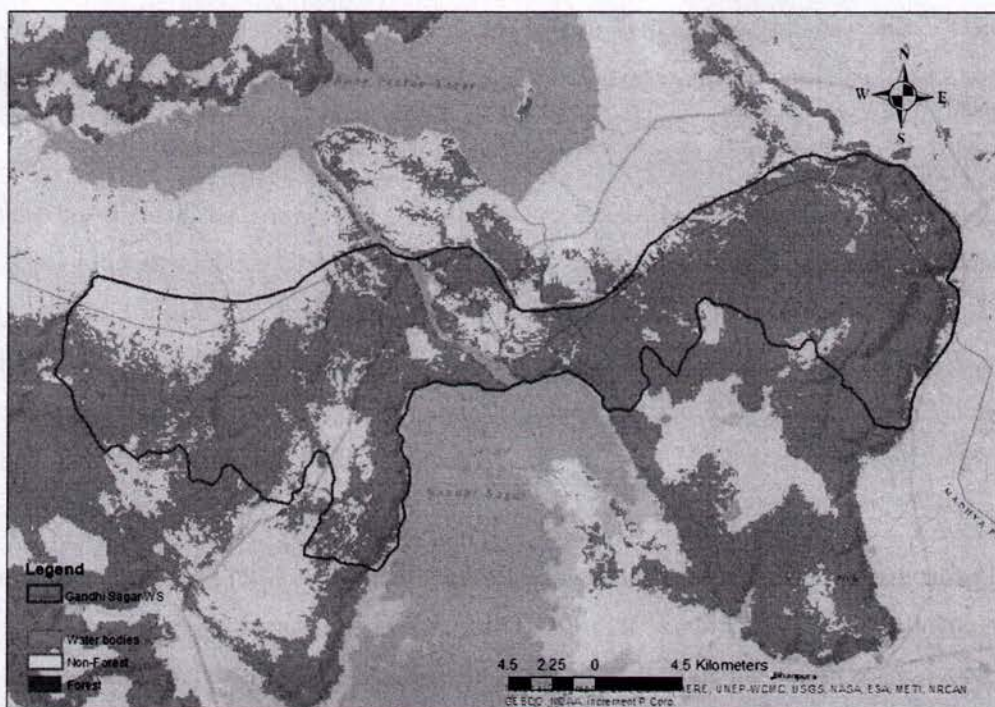


Figure 5: Gandhi Sagar Wildlife Sanctuary of Madhya Pradesh

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5. Kumbhalgarh Wildlife Sanctuary:

Area: 610 km²

State: Rajasthan, India

Biogeographic zone: Semi-arid biogeographic zone, Gujarat-Rajputana biotic province 4B³⁴

Vegetation Type: Tropical dry deciduous forest

Geography: Kumbhalgarh Wildlife Sanctuary is situated between 73°15' E, 25°00' N to 73°45' E, 25°30' N in the Rajsamand District of central-southern Rajasthan State and spanning over an area of 610 km² out of which 224.890 km² is designated as core zone and 385.638 km² area as buffer. It falls under the "semi-arid bio-geographic zone; Gujarat-Rajputana biotic province 4B³⁴ and Kathiarbar-Gir Dry Deciduous Forests eco-region³⁷. The sanctuary forms the ecotone between the hilly forests of Aravallis and the Thar desert⁵¹. The vegetation is characterized by tropical dry deciduous forests with a mix of savanna grasslands, patchy riparian corridors of dense perennial canopy. The geography of the Sanctuary is characterized by highly eroded remnant of Precambrian uplift which follows the Aravali hill and covers the hill ranges of Kumbhalgarh, Sadri, Desuri and the Bokhada. The elevation varies from 275m to 1155 m from mean sea level⁵². Kumbhalgarh hills forms the catchment of many rivers and nallahs⁵¹.

Prey-predator diversity: The sanctuary is diverse in terms of carnivorous species and their prey. Carnivore species includes Wolves (*Canis lupus*), Leopards (*Panthera pardus*), Sloth Bear (*Melursus ursinus*), Striped hyaenas (*Hyena hyena*), Golden jackal (*Canis aureus*), Jungle cat (*Felis chaus*), Indian fox (*Vulpes bengalensis*), Small Indian civet (*Viverricula indica*), Common palm civet (*Paradoxurus hermaphroditus*), Grey mongoose (*Herpestes edwardsi*) and Small Indian mongoose (*Herpestes javanicus*). Among herbivores Hanuman langur (*Semnopithecus entellus*), Sambar (*Rusa unicolor*), Indian Gazell (*Gazella bennettii*) Nilgai (*Boselaphus tragocamelus*), Four horned antelope (*Teracerus quadricornis*), Indian crested porcupine (*Hystrix indica*) and Wild pig (*Sus scrofa*)⁵¹.

Climate: The landscape experiences a sub-tropical climatic condition with extremely hot summer and relatively moderate winter. Winter ranges from November to February, summer ranges from March to June and rainy season starts from mid-June and continues up to September⁵¹. The average annual temperature varies between 5°C in winter and 48°C in summer and the average annual rainfall is about 725 mm ranges from 403 mm to 950 mm⁵².

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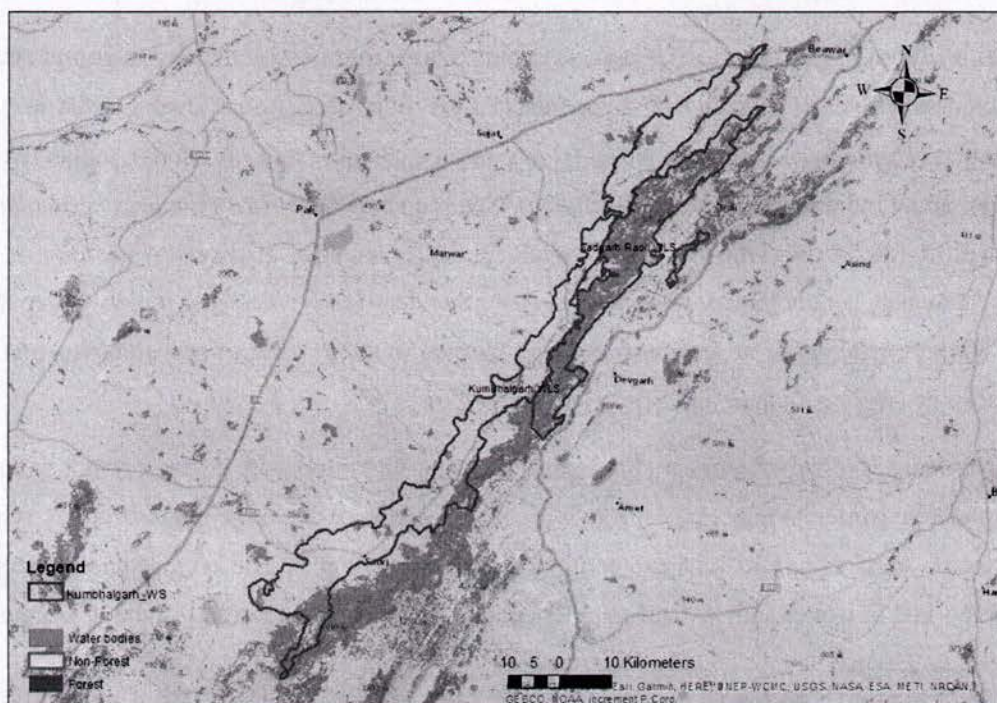
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Anthropogenic pressure: There is no human settlement inside the sanctuary ⁵¹. However, about 94,388 people are known to live within 5 km of the boundary of the sanctuary in about 33 settlements. The sanctuary experiences threats from over grazing by domestic livestock, illegal tree cutting, forest fire and invasive plants like *Lantana camara* and *Prosopis juliflora* ⁵².

Priority and management interventions needed:

Although there are no human settlements within the protected area, biotic pressure from the peripheral villages are immense. Therefore, creating alternative livelihood opportunities for the villages around the sanctuary is necessary to reduce dependency of people on forest products. Habitat improvement to increase prey base density, weed eradication, water management, vaccination of livestock around the sanctuary boundary to prevent disease transmission to wild animals, and infrastructure development for anti-poaching activities and mitigate human-wildlife conflict needs to be carried out.



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 Figure 6: Kumbhalgarh Wildlife Sanctuary, Rajasthan
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6. Jessore-Balaram Ambaji WLS and adjoining landscape:

Area: 542.08 km² (Balaram Ambaji WLS)

180 km² (Jessore Wildlife Sanctuary)

State: Gujarat, India

Biogeographic zone: Semi-arid biogeographic zone, Gujarat-Rajputana biotic province 4B³⁴

Vegetation Type: Tropical dry deciduous forest

Geography: The areas of Jessore-Balaram Ambaji WLS comprises of Jessore Sloth Bear Sanctuary, Balaram-Ambaji WLS and adjoining forests in the north western part of Gujarat state. Both the sanctuaries are in the Aravali hill range and connected to the Mount Abu in Rajasthan through degraded forest corridors. The landscape is spanning between 23° 35' to 24° 43' N and 71° 0' to 73° 0' E in the district of Banaskantha, Gujarat. The total area of the Jessore Wildlife Sanctuary is 180 km² whereas the area of Balaram Ambaji Wildlife Sanctuary is 542.08 km². The straight aerial distance between the protected areas are not more than 7 km and forms a complex of forested landscape which harbors many important flora and fauna. The landscape falls under the semi-arid bio-geographic zone, Gujarat-Rajputana biotic province 4B³⁴ and Kathiarbar-Gir Dry Deciduous Forests eco-region³⁷. The terrain is characterized by rugged hills cutting through by few rivers and rivulets. The landscape has great ecological significance as it acts as a buffer between the desert eco-system and the dry deciduous type of forest ecosystem⁵³. Elevation ranges from 10m to 1000m (Jessore peak) above mean sea level. The vegetation is characterized by dry deciduous forests with dominant trees of *Commiphora wightii*, *Bombaxceiba*, *Cassia auriculate*, *Cassia fistula*, *Diospyros melanoxylon*, *Ziziphus mauritiana* and *Butea monosperma*.

Prey-predator diversity: The landscape provides space for a great diversity of mammalian species. The major carnivorous species found in the landscape are Sloth Bear (*Melursus ursinus*), Indian leopards (*Panthera pardus*), Wolves (*Canis lupus*), Striped hyaenas (*Hyena hyena*), Golden jackal (*Canis aureus*), Jungle cat (*Felis chaus*), Indian fox (*Vulpes bengalensis*), Honey badger (*Melivora capensis*), Small Indian civet (*Viverricula indica*), Common palm civet (*Paradoxurus hermaphroditus*) and Grey mongoose (*Herpestes edwardsi*) and Ruddy mongoose (*Herpestes smithii*). Among herbivores Hanuman langur (*Semnopithecus entellus*), Rhesus macaque (*Macaca mulatta*) Sambar (*Rusa unicolor*), Spotted Deer (*Axis*

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axis), Nilgai (*Boselaphus tragocamelus*), and Wild pig (*Sus scrofa*). Besides the sanctuary is rich with many other rare and endangered faunas such as Indian pangolin (*Manis crassicaudata*), Indian hedgehog (*Hemiechinus micropus*) and Indian Giant Flying Squirrel (*Petaurista ptilipensis*) etc. ⁵⁴.

Climate: The landscape experiences a sub-tropical climatic condition with extremely hot summer and relatively moderate winter. Winter ranges from November to February, summer ranges from March to June and rainy season starts from mid-June and continues up to September. The average annual temperature varies between 5°C in winter and 46°C in summer. The average annual rainfall in the landscape 765mm⁵⁵.

Anthropogenic pressure: There are many temples in the landscape, besides the famous Balaram and Ambaji temples, which attracts millions of tourists. Average 5-6 lakh pilgrims are known to visit these temples every week. The landscape also experiences intensive mining for marbles, around the sanctuaries⁵⁶.

Priority and management interventions needed:

This landscape with restoration of habitat corridors between the two protected areas forms a good area for re-introduction of lions within Gujarat. Unlike Barda this landscape does not have connectivity with the existing lion population in Gir, that ensures the isolation of the re-introduced population of the species. There are about 15523 households known to be present within the sanctuary⁴³. Therefore, this landscape needs intensive management interventions to resettle villages from the protected areas, improve habitat quality, prey base, regulate mining activities within the eco-sensitive zone, vaccination of livestock in the peripheral villages and conflict mitigation strategies.

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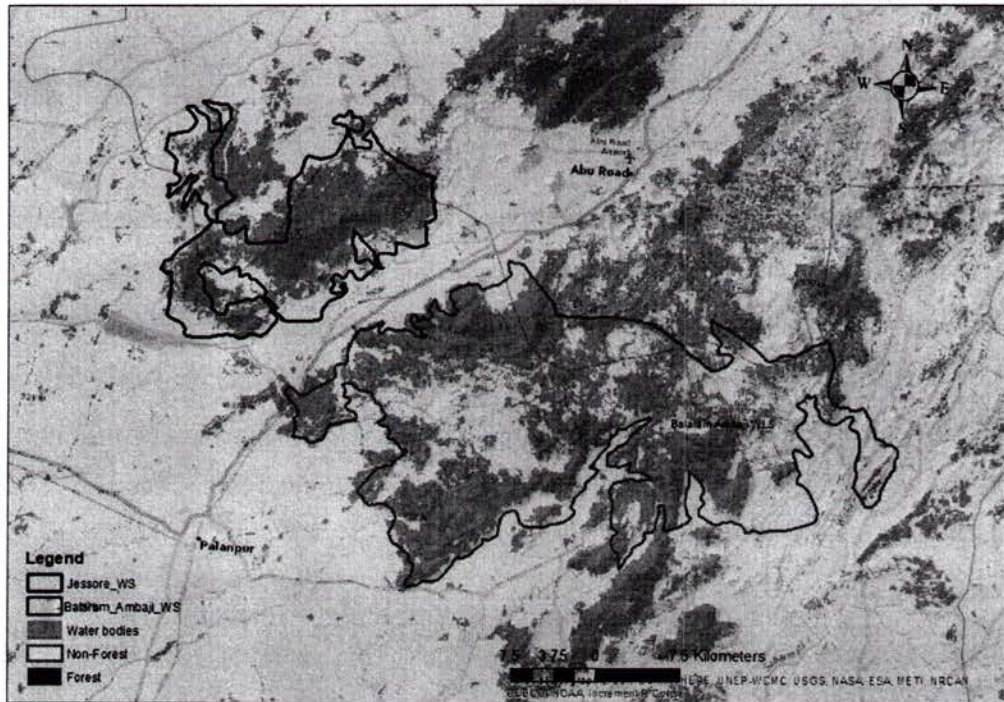


Figure 7: Jessor-Balaram Ambaji Wildlife Sanctuary complex, Gujarat

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Appendix 3: Comparison between Gir Protected Area and Kuno National Park

In order to minimize the extinction probability of Gir lions from any probable future stochastic event like a disease epidemic or a natural calamity, the Kuno Protected Area in Madhya Pradesh was identified 1995 as a potential site for establishing a second lion population. Substantial investments by the Government of India and Madhya Pradesh have been made to make Kuno ideal for receiving lions. Comparisons of the following parameters between Gir and Kuno explicate Kuno as being ready for receiving and nurturing a second population of Asiatic Lions in India:

Parameter	Gir Protected Area	Kuno Protected Area
Size of the Protected Area & human free area	The total area of the Gir is 1,883 km ² inclusive of a Gir Wildlife Sanctuary of 1,153 km ² . The only area exclusively for Asiatic lions in the world is the Gir National Park of about 259 km ² .	Total area of Kuno Wildlife Division is 1,235 km ² . Human free Kuno National Park is about 748 km ² . About 2.7 times larger than Gir National Park.
Bio-geographic zone	Semi-arid zone (4b), Gujarat-Rajputana biogeographic region ³⁴	Semi-arid zone (4b), Gujarat-Rajputana biogeographic region. The topography of Kuno is better suited for lions.
Habitat and vegetation	Dry deciduous teak forests in the western part of Gir PA and dry deciduous thorn forests, scrub forests and dry savannah forests in the eastern part of the PA.	Northern tropical dry deciduous forest. Under this type Southern tropical dry deciduous forest, <i>Anogeissus pendula</i> forest and scrub and <i>Boswellia</i> forest, <i>Butea</i> forest, dry savannah forest and grassland are predominant.
Size of the forested landscape outside the PA where lions can potentially disperse and persist. Historical distribution.	Currently lions occupy about 13,000 km ² of Saurashtra landscape adjoining the Gir PA. This area is shared with intense agriculture, high density livestock and people. Forested areas & grasslands (Vidis) that are actual refuges for lions in this landscape are < 500 km ² .	About 4,000 km ² of contiguous forest patch surrounds Kuno PA. This area has low human and livestock density compared to the Saurashtra Landscape. It was occupied by lions in medieval times. Descriptions of lion hunts in this region are found in Mughal writings. The entire landscape is conducive for lions.

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Prey densities in Protected Area	<p>Wild prey (#/km²) Chital – 56.1 (8.3), Sambar – 2.4 (0.5), Nilgai – 0.3 (0.1), Wild pig – 3 (1.3), Chinkara – 0.6 (0.3), Chowsingha – 0.2 (0.1), Langur – 9.1 (2.2), Peafowl – 10 (2).</p> <p>Domestic prey Cattle – 4.4 (4), Buffalo – 9.4 (3.4) [numbers within parentheses are Standard Errors]</p>	<p>Wild prey (#/km²) Chital – 52.5 (8), Sambar – 6.6 (1), Nilgai – 3.5 (1), Wild pig – 4.3 (0.9), Chinkara – 0.6 (0.3), Chowsingha – 0.8 (0.3), Langur – 12.5 (3)</p> <p>Domestic prey Feral Cattle – 1.4 (0.7)</p> <p>[numbers within parentheses are Standard Errors]</p> <p>In 2006 chital densities were as low as 5 per sq. km ⁵⁷ but with good protection by 2014 they increased to > 50 per sq. km ⁵⁸.</p>
Investments made and impact on local livelihood	<p>Communities in the Gir Landscape making direct or indirect profit from lions were more tolerant toward them. The two important economic benefits from lions were: (a) their propensity to predate nilgai and wild pigs, both considered as agricultural pests and (b) presence of lions offered an opportunity for tourism and employment.</p>	<p>Government of India and Madhya Pradesh Government have already spent approximately USD 3.4 million till 2007 for relocating 24 human settlements from Kuno WLS and for other habitat management interventions ⁵⁹. The local economy around Kuno is poor and would benefit from jobs and economies created by lion reintroduction.</p>

Furthermore, Madhya Pradesh Forest Department has an excellent track record of conserving and managing large carnivores such as tigers within the state since long. As per the recent all India tiger estimation report released by the Honorable Prime Minister, Madhya Pradesh bags the reputation of having the largest number of tigers and is the “tiger state” of the country with a population of 526 tigers. The state supports ~14% of tiger and ~23% of India's leopard population and has 15,156 km² of forests occupied by tigers ³⁶. Some of the Protected Areas in Madhya Pradesh like Bandhavgarh, Kanha Tiger Reserves have tiger population with more than 80 individuals, which serve as major source populations ensuring the persistence of other tiger metapopulations across the whole Central Indian Landscape ²³. Moreover, the state forest department also has the expertise and capacity of capturing, handling, translocating and radio-telemetry which all will be essential for managing the reintroduced lion population in Kuno.

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