

## **Morand and Ganjal Project: Clarification on Tiger Habitats**

### **Minutes of the 96<sup>th</sup> EAC meeting held on 11-8-2016** **with reference to Agenda Item 2.1**

**Observation No. 3:** The data base on status of wildlife species and their habitats of the project area and adjoining tiger habitats generated under the All India Tiger Monitoring Programme for the years 2006, 2010, and 2014 by the State Forest/Wildlife Department should be incorporated in the report.

#### **1. Submergence Area :**

**Morand:** The forest area in submergence of the proposed Morand Dam falls under 18 Forest Beats in 4 Forest Ranges of 3 Forest Divisions, as shown in Annexure-I.

**Ganjal:** The forest area in submergence of the proposed Ganjal Dam falls under 8 Forest Beats in 2 Forest Ranges of 1 Forest Division, as shown in Annexure-II.

#### **2. Wildlife Estimation Procedure :**

The submergence area of Morand and Ganjal Dams is situated scores of kilometres away from any existing National Park / Sanctuary and is not an important tiger habitat; therefore, continuous intensive monitoring using modern equipment is not done in the area by the MP Forest Department (MPFD). However, a statewide Wildlife Estimation exercise is conducted by MPFD at 4 year interval under the overall supervision of the Chief Wildlife Warden, M.P., which follows the procedure laid down by the Wildlife Institute of India, Dehradun. Data pertaining to major wildlife species and the habitat is collected over a week-long duration. Afterwards, the data at the state level is compiled by Kanha Tiger Reserve, Mandla and sent to the Wildlife Institute of India, Dehradun for analysis and publication of findings. The Wildlife Institute of India, Dehradun analyses and publishes results of the above exercise only on landscape / state level. Thus, the expected number of individuals of various wildlife species occurring strictly in the submergence and adjoining areas cannot be estimated from the collected data. However, the number of observed wildlife signs, a fair index of wildlife occurrence, in the submergence and surrounding areas can be discussed on the basis of data collected in 18 Beats in Morand and 8 Beats in Ganjal Dam submergence.

#### **3. Source & Duration of the Data :**

The original data for the years 2010 and 2014, pertaining to all the Forest Beats and Forest Ranges concerned with submergence was obtained from Kanha Tiger Reserve, Mandla. The data for the year 2006 estimation exercise could not be received from them. However, the available 2010 & 2014 data provide a sufficiently clear picture of the status of wildlife in the area. For these years, the field exercise was conducted during 10-15 February, 2010 and 20-25 January, 2014 respectively.



#### **4. Methodology Used for Data Collection :**

In the field exercise for Wildlife Estimation, each Forest Beat is taken as the basic unit for data collection. For each of the first three days the observer moves in different free trails, roughly pre-planned in such a way that over the 3-day period the whole area of the Beat and the preferred / likely habitat of important carnivore species is visited at least once at the most opportune time of the day. Each direct sighting or indirect evidence of any carnivore species is recorded, among many other things. During the next 3-4 days, much detailed information is collected about different aspects of the habitat, including the numbers of direct sighting and indirect evidences of important herbivore species with the help of a fixed line transect and fixed sample plots carefully designed and laid out on the field beforehand. The transect is made representative of the whole area of the Beat by ensuring its passage through all types of habitat known to occur in the Beat. This fixed line transect is daily traversed start-to-end by the observer, who records details about herbivores actually seen by him on either side as he walks along the transect. As a separate activity after completing the traverse, indirect evidences of herbivores are collected by carrying out pellet / dung count in the fixed sample plots. A host of other information is also recorded during this week-long field exercise.

#### **5. Data Pertaining to Submergence Area :**

Since the Forest Department collects Beat level information, the data for the actual submergence area is best approximated by the collective data of all the Beats concerned with submergence, i.e. 18 Beats for Morand and 8 for Ganjal.

Moreover, the relative importance of Beats in the context of forests at large can be judged by comparing their collective data with that of the whole Ranges concerned with submergence, i.e. 4 Ranges for Morand and 2 for Ganjal.

Further, the original data from the estimation exercise requires rearrangement and summarisation for a meaningful interpretation. The final abstract thus obtained serves as an index of occurrence of wildlife in submergence area and adjoining areas and has been presented herewith as Annexures-III to VI.

Annexure-III shows the numbers of direct sighting and indirect evidences of various species of carnivores for all the 18 concerned Beats of Morand, followed by the numbers of direct sighting of various species of herbivores, for the year 2010 and 2014. Similarly, Annexure-IV shows the same for all the 8 concerned Beats of Ganjal.

Further, Annexure-V shows the numbers of direct sighting and indirect evidences of various species of carnivores for all the 4 concerned Ranges of Morand, followed by the numbers of direct sighting of various species of herbivores, for the year 2010 and 2014. Similarly, Annexure-VI shows the same for all the 4 concerned Ranges of Ganjal.



It is pertinent to note here that out of the 18 line transects of the concerned 18 Beats of Morand, as many as 13 lie completely outside the submergence area, with only 5 lying partially inside (Jamnagri, Lehi, Mahuadhana, Morghat and Samardha). Similarly, out of the 8 line transects of the concerned 8 Beats of Ganjal, as many as 4 lie completely outside the submergence area, with only 4 lying partially inside (Bothi, Dong, Jawardha and Kayri). The coordinates of the start and end points of all the line transects have been listed in Annexure-I & Annexure-II and google imagery incorporated as Annexure-VII and Annexure-VIII for Morand and Ganjal respectively.

#### **6. Interpretation of the Data :**

Specifically speaking of the tiger, there were no direct sightings or indirect signs of tigers in 2010 in all the 18 / 8 Beats of Morand / Ganjal. In 2014 also, the same situation existed in respect of Ganjal, whereas only 1 direct sighting and 2 indirect signs were recorded from merely 2 Beats of Morand. This implies that the tiger uses a very small area out of all the 18 Beats of Morand, that too only occasionally.

As regards other 5 important carnivore species (leopard, dhole, wolf, hyaena, and bear) taken together, the direct sightings were 6 & 3 and indirect signs were 40 & 40 for the years 2010 & 2014 respectively in all the 18 Beats of Morand. The corresponding figures for all the 8 Beats of Ganjal were 0 & 2 and 3 & 27 for the years 2010 & 2014 respectively.

As regards 6 important ungulate herbivore species (sambhar, chital, nilgai, barking deer, black buck and chinkara) taken together, the direct sightings were 25 & 80 for 2010 & 2014 respectively in all the 18 Beats of Morand. The corresponding figures for all the 8 Beats of Ganjal were 18 & 72 for 2010 & 2014 respectively.

Thus, generally low numbers in respect of important species in Annexure-III and Annexure-IV is the common and striking feature of the data. In other words, the numbers of direct sighting as well as the indirect evidences of carnivores and herbivores in all the concerned Beats have been consistently low since 2010, thereby indicating poor wildlife occurrence. Thus, the submergence forest area along with the remaining adjoining area of the 18 / 8 Beats of Morand / Ganjal is not rich in wildlife values in absolute terms.

Secondly, the low ratio of the Beat level figures to the corresponding Range level figures (Annexure-III vs Annexure-V, Annexure-IV vs Annexure-VI) point to still lesser importance of these Beats vis-à-vis the Ranges. Thus, the submergence forest area along with the remaining adjoining areas of the 18 / 8 Beats of Morand / Ganjal are not rich in wildlife values in relative terms either.

Thirdly, for Morand, the submergence forest area is 1,343 hectares, a mere 8.5% of the total forest area of the concerned 18 beats, viz. 15,767.356 hectares. Similarly, for Ganjal, the submergence forest area is 833 hectares, a mere 8.7% of the total forest area



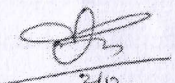
of the concerned 8 beats, viz. 9,528.418 hectares. Thus even after submergence, ample adjoining forest area shall remain in the 18 / 8 Beats of Morand / Ganjal for the existing wildlife to take refuge in.

Fourthly, with the coming into existence of large water bodies in the form of reservoirs, the existing wildlife is expected to thrive upon the munificence of abundant perennial water, the most crucial of all the limiting factors for any wildlife population.

Fifthly, the submergence area does not fall within 10 kilometres of any notified Protected Area (National Park, Sanctuary or Conservation Reserve). In fact as mentioned in the original EIA report, the nearest notified Protected Areas and important tiger habitat are Ratapani Sanctuary, M.P., located 55 km North of Morand dam site, Satpura Tiger Reserve, M.P., located 45 km Northeast of Ganjal Dam site and Melghat Tiger Reserve, Maharashtra, located 60 km South and Southeast of Morand dam site. These three Protected Areas are arranged in a crescent toward the East of the two dams from North to South.

#### 7. Conclusion :

In view of the foregoing scenario and interpretation, it is apparent that the submergence area is not much important from the point of view of tigers and if the Project receives clearance, the adjoining areas shall only get an impetus towards becoming an improved wildlife habitat due to availability of increased and perennial water source to support much bigger wildlife populations in future.

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## Annexure - I

### Details of Area under Morand Dam Submergence

#### A. Range Level Details

No. of Forest Ranges Concerned = 4

Total Forest Area of All the Ranges Concerned = 82,811.547 ha.

Submergence Forest Area in All the Ranges Concerned = 1343 ha. (1.6%)

Division	Sub Division	Range	Total Forest Area of the Range (ha.)
North Betul	Shahpur	Bhaura	27,496.388
West Betul	Chicholi	Gawasen	16,599.617
Hoshangabad	Seoni Malwa	Seoni Malwa	18,113.580
Hoshangabad	Seoni Malwa	Banapura	20,601.962
3	3	4	82,811.547



## B. Beat Level Details

No. of Forest Beats Concerned = 18

Total Forest Area of All the Beats Concerned = 15,767.356 ha.

Submergence Forest Area in All the Beats Concerned = 1343 ha. (8.5%)

Range	Range Assistant Circle	Beat	Number of Comptts.	Beat Area (ha.)	Transect Start (Latitude)	Transect Start (Longitude)	Transect End (Latitude)	Transect End (Longitude)
Bhaura	Tokra	Davthan	5	1,346.904	22.331444	77.589389	22.331333	77.543028
Bhaura	Tokra	Tokra	7	1,536.499	22.289278	77.525333	22.311556	77.525083
Bhaura	Tokra	West Panchi	5	1,212.651	22.313972	77.53775	22.296972	77.566583
<b>Total</b>	<b>1</b>	<b>3</b>	<b>17</b>	<b>4,096.054</b>				
Gawasen	Baladongri	Barkhera	8	1,876.833	22.236528	77.530611	22.23675	77.526722
Gawasen	Baladongri	Jamnagri	6	873.690	22.255528	77.492333	22.256833	77.511806
<b>Total</b>	<b>1</b>	<b>2</b>	<b>14</b>	<b>2,750.523</b>				
Seoni Malwa	Dekana	Dhavida	10	1,020.251	22.260417	77.480806	22.261667	77.443056
Seoni Malwa	Jamani	Beeltalai	2	461.016	22.345056	77.535458	22.365861	77.532833
Seoni Malwa	Jamani	Budimai	2	584.723	22.351117	77.519972	22.361667	77.533194
Seoni Malwa	Jamani	Jamani	2	586.841	22.344722	77.494917	22.335264	77.507972
Seoni Malwa	Jamani	Mahudhana	3	863.874	22.312528	77.471472	22.329778	77.490056
Seoni Malwa	Lokhartalai	Kamtha	2	473.390	22.273639	77.433419	22.284478	77.459806
Seoni Malwa	Lokhartalai	Palasi	4	1,084.447	22.272167	77.424278	22.301578	77.438917
Seoni Malwa	Lokhartalai	Lahi	3	559.700	22.307139	77.474972	22.306972	77.505361
Seoni Malwa	Lokhartalai	Morghat	3	694.832	22.306806	77.455722	22.289111	77.448
Seoni Malwa	Lokhartalai	Lokhartalai	3	513.312	22.331472	77.460611	22.353389	77.440583
Seoni Malwa	Lokhartalai	Samardha	5	634.429	22.293528	77.502944	22.287194	77.469047
<b>Total</b>	<b>3</b>	<b>11</b>	<b>39</b>	<b>7,476.814</b>				
Banapura	Natar-kola	Bendripura	3	878.090	22.361056	77.54225	22.37175	77.53975
Banapura	Natar-kola	Takripura	2	565.875	22.371056	77.557583	22.356917	77.559972
<b>Total</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>1,443.965</b>				
<b>Grand Total</b>	<b>6</b>	<b>18</b>	<b>75</b>	<b>15,767.356</b>				



## Annexure - II

### Details of Area under Ganjal Dam Submergence

#### A. Range Level Details

No. of Forest Ranges Concerned = 2

Total Forest Area of All the Ranges Concerned = 36,005.046 ha.

Submergence Forest Area in All the Ranges Concerned = 833 ha. (2.3%)

Division	Sub Division	Range	Total Forest Area of the Range (ha.)
Harda	North Harda	Rahatgaon	17,253.193
Harda	North Harda	Temagaon	18,751.853
1	1	2	36,005.046



### B. Beat Level Details

No. of Forest Beats Concerned = 8

Total Forest Area of All the Beats Concerned = 9,528.418 ha.

Submergence Forest Area in All the Beats Concerned = 833 ha. (8.7%)

Range	Range Assistant Circle	Beat	Number of Compts.	Beat Area (ha.)	Transect Start (Latitude)	Transect Start (Longitude)	Transect End (Latitude)	Transect End (Longitude)
Rahatgaon	Gorakhal	Domra	4	1,627.479	22.142500	77.332222	22.160770	77.330100
Rahatgaon	Gorakhal	Kayari	4	1,639.502	22.159167	77.377500	22.175570	77.370310
<b>Total</b>	<b>1</b>	<b>2</b>	<b>8</b>	<b>3,266.982</b>				
Temagaon	West Jawardha	Amba	3	1,166.172	22.210139	77.306000	22.208333	77.339167
Temagaon	East Jawardha	Bothi	3	1,085.406	22.208667	77.346389	22.207500	77.372139
Temagaon	Jhabbida	Dong	3	764.965	22.236222	77.312806	22.216028	77.313694
Temagaon	West Jawardha	Jawardha	4	1,212.732	22.226967	77.330194	22.222242	77.366786
Temagaon	East Jawardha	North Mahukhal	4	1,558.119	22.212500	77.373333	22.175278	77.400000
Temagaon	Jhabbida	Pandermati	2	474.042	22.227000	77.300278	22.248389	77.303611
<b>Total</b>	<b>3</b>	<b>6</b>	<b>19</b>	<b>6,261.436</b>				
<b>Grand Total</b>	<b>4</b>	<b>8</b>	<b>27</b>	<b>9,528.418</b>				



### **Annexure - III**

#### **Abstract of Specieswise Evidences Reported from All the Beats in Morand Dam Submergence**

**Source:**

**Wildlife Estimation Exercises  
Conducted by MP Forest Department  
February 10-15, 2010 & January 20-25, 2014)**

##### **a. CARNIVORES**

Species	Total No. of Evidences from All the Beats Concerned (Free Trails)			
	Year 2010		Year 2014	
	Direct	Indirect	Direct	Indirect
Tiger	-	-	1	2
Leopard	-	3	-	2
Dhole	2	3	-	2
Wolf	-	1	1	-
Hyaena	3	6	-	1
Jackal	-	2	6	10
Bear	1	27	2	35

##### **b. HERBIVORES**

Species	Total No. of Evidences from All the Beats Concerned (Fixed Line Transects)	
	Year 2010	Year 2014
	Direct	Direct
Sambhar	1	19
Chital	-	3
Nilgai	11	46
Barking Deer	10	12
Black Buck	1	-
Chinkara	2	-
Wild Pig	11	36
Langur	36	198
Hare	7	7



## **Annexure - IV**

### **Abstract of Specieswise Evidences Reported from All the Beats in Ganjal Dam Submergence**

Source:

Wildlife Estimation Exercises  
Conducted by MP Forest Department  
February 10-15, 2010 & January 20-25, 2014)

#### **a. CARNIVORES**

Species	Total No. of Evidences from All the Beats Concerned (Free Trails)			
	Year 2010		Year 2014	
	Direct	Indirect	Direct	Indirect
Tiger	-	-	-	-
Leopard	-	1	1	10
Dhole	-	-	-	4
Wolf	-	-	-	3
Hyaena	-	-	1	5
Jackal	-	1	6	23
Bear	-	2	-	5

#### **b. HERBIVORES**

Species	Total No. of Evidences from All the Beats Concerned (Fixed Line Transects)	
	Year 2010	Year 2014
	Direct	Direct
Sambhar	-	6
Chital	-	2
Nilgai	11	21
Barking Deer	7	29
Black Buck	-	1
Chinkara	-	13
Wild Pig	9	61
Langur	11	173
Hare	-	7



## Annexure - V

### Abstract of Specieswise Evidences Reported from All the Ranges in Morand Dam Submergence

Source:  
Wildlife Estimation Exercises  
Conducted by MP Forest Department  
February 10-15, 2010 & January 20-25, 2014)

#### a. CARNIVORES

Species	Total No. of Evidences from All the Ranges Concerned (Free Trails)			
	Year 2010		Year 2014	
	Direct	Indirect	Direct	Indirect
Tiger	-	-	1	2
Leopard	-	3	-	16
Dhole	2	3	2	17
Wolf	-	1	4	1
Hyaena	3	6	1	15
Jackal	-	2	41	45
Bear	1	27	5	203

#### b. HERBIVORES

Species	Total No. of Evidences from All the Ranges Concerned (Fixed Line Transects)	
	Year 2010	Year 2014
	Direct	Direct
Sambhar	1	64
Chital	-	25
Nilgai	11	205
Barking Deer	10	64
Black Buck	1	-
Chinkara	2	3
Wild Pig	11	300
Langur	36	1,538
Hare	7	38



## Annexure - VI

### Abstract of Specieswise Evidences Reported from All the Ranges in Ganjal Dam Submergence

Source:  
Wildlife Estimation Exercises  
Conducted by MP Forest Department  
February 10-15, 2010 & January 20-25, 2014)

#### a. CARNIVORES

Species	Total No. of Evidences from All the Ranges Concerned (Free Trails)			
	Year 2010		Year 2014	
	Direct	Indirect	Direct	Indirect
Tiger	-	-	3	5
Leopard	-	7	1	32
Dhole	-	1	-	12
Wolf	-	2	2	8
Hyaena	-	2	1	15
Jackal	1	12	15	62
Bear	-	4	-	59

#### b. HERBIVORES

Species	Total No. of Evidences from All the Ranges Concerned (Fixed Line Transects)	
	Year 2010	Year 2014
	Direct	Direct
Sambhar	5	14
Chital	9	33
Nilgai	25	47
Barking Deer	26	43
Black Buck	-	3
Chinkara	15	34
Wild Pig	21	142
Langur	59	677
Hare	8	11