

H.P. FOREST DEPARTMENT (WILDLIFE WING)

# MANAGEMENT PLAN



## MANALI WILDLIFE SANCTUARY (WILDLIFE DIVISION KULLU)

(2019-20 TO 2028-29)

By :

**RAKESH KUMAR (HPFS)**  
(DFO, Wildlife Division Kullu)

**YOGENDER SHARMA (HPFS)**  
(ACF, Wildlife Division Kullu)

*Authenticated*  
Principal Chief Conservator of Forests  
Wildlife, Himachal Pradesh  
Shimla - 171001



H.P. FOREST DEPARTMENT, ARANAYA BHAWAN, TALLAND, SHIMLA-171001

No. WLM/Management Plan/ 6475

Dated/ 15/11/19

To

✓ The Conservator of Forests,  
Great Himalayan National Park, Shamshi.

Subject: Preparation of Management Plans of Protected Areas-regarding.....

Memo:

Kindly refer to your Office Memo. No. 4476 dated 05.10.2019 on the Subject  
cited above.

2. The Management Plans for Kais and Manali Wildlife Sanctuaries are hereby  
approved. Two copies of each approved Management Plan of said Wildlife Sanctuaries are sent  
herewith for your information and further necessary action please. These may be got printed  
and hard bound copy thereof may be sent to this office for record.

You are also requested to submit the remaining management plans of Kanawar,  
Khokhan & Nargu Wildlife Sanctuaries.

Encls: As above.



Pr. Chief Conservator of Forests (WL),  
and Chief Wildlife Warden, Shimla, HP

Enclt No. 5480 Dated 20/11/2019

Copy alongwith management plans of  
Kais and Manali wildlife sanctuaries is forwarded  
to D.O. wildlife Kulu for information and  
further necessary action.

Encl: As above.

20/11

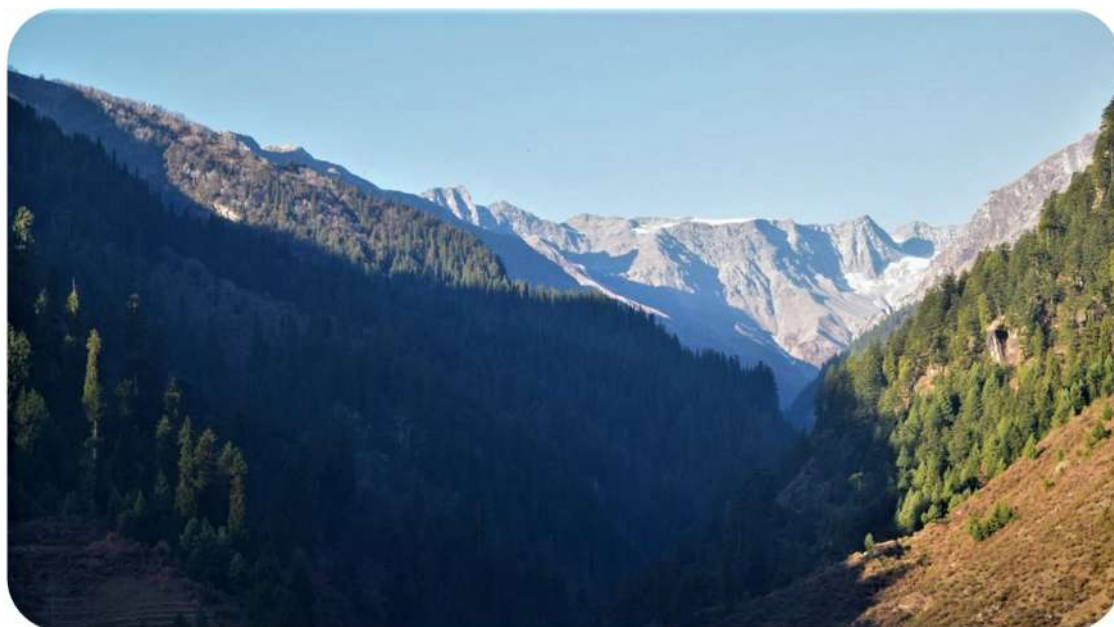
Conservator of Forests  
Wildlife Section

3147

21-11-19

H.P. FOREST DEPARTMENT (WILDLIFE WING)

# MANGEMENT PLAN



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## Preface

The 26 wildlife sanctuaries and 5 National Parks in Himachal Pradesh constitutes state's Protected Area network. Manali Wildlife sanctuary is one of the seven sanctuaries under Kullu wildlife Division. The previous management plan was from 2004-05 to 2013-14. The present Management Plan has been prepared for the period of 10 years (2019-20 to 2028-29).

For writing Part-I, existing information of previous management plans and other published literature for the area has been used. During plan preparation, a survey was also conducted to collect information related to socio-economic conditions of local communities living in and around Manali WLS. In addition, data related to human wildlife conflict and dependence of local people on PA resources was also collected and this data have been included in the relevant chapters of the plan.

For writing of Management Plan guidelines prepared by V.B Sawarkar and issued by Wildlife Institute of India for planning of wildlife management in protected areas and managed landscapes have been followed.

For the management of any mountain PA, three issues are important – Protection, Local people's participation in management of PA and regular monitoring to assess the effectiveness of management. Therefore, in this management plan, major emphasis has been given to above issues.

Management of PAs is a dynamic process and due to change in local environment, State policies continuous review is required to adapt various strategies to achieve the desired objectives. In view of this, chapter 12 incorporates annual review and a strategic review after five year of this plan has been suggested.



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## **ABBREVIATIONS**

ACF	Assistant Conservator of Forest
AMSL	Above Mean Sea Level
APOs	Annual Plan operations
CAMPA	Compensatory Afforestation fund Management and Planning Authority
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CSS	Centrally Sponsored Schemes
DCF	Deputy Conservator of Forest
DFO	Divisional Forest Officer
DSLR	Digital Single Lens Reflex
GHNP	Great Himalayan National Park
GoHP	Government of Himachal Pradesh
GPS	Global Positioning System
HQ	Head Quarters
HWC	Human Wildlife Conflict
IFS	Indian Forest Service
IRS	Indian Remote Sensing
IUCN	International Union for Conservation of Nature
LCC	Land Capability Classification/ Local Control Cubicle
LED	Light Emitting Diode
LPG	Liquefied Petroleum Gas
MoEF & CC.	Ministry of Environment and Forests & Climate Change
NGOs	Non-Governmental Organization
NTFP	Non timber Forest Products
NWP	Non Wood Products
PA	Protected areas
Pr. C.C.F.	Principal Chief Conservator of Forests
PRA	Participatory Rural Appraisal
RHRS	Regional Horticultural Research Station
TD	Timber Distribution
UPFs	Un-Protected Forests
UTM	Universal Transverse Mercator
WLS	Wildlife Sanctuary
WWF	World Wildlife Fund
ZI	Zone of Influence
ZIP	Zone Information Protocol

# **PART – I**

## **The Protected Area: Existing Situation**

## CHAPTER - 1

### INTRODUCTION OF THE AREA

#### 1.1 NAME, LOCATION, CONSTITUTION AND EXTENT OF AREA

The collective name for the two Demarcated Protected Forests viz., Bangdwari and Monalgahar is Manali Wildlife Sanctuary (WLS). This sanctuary is situated in Manali Tehsil of District Kullu (HP). The Sanctuary was initially notified vide Govt. Notification No. 70/G.P. 53/97 dated 28<sup>th</sup> February, 1954 under the Punjab Birds and Wild Animals Protection Act, 1933 (Annexure- I) and is located between the following coordinates:

Latitude        32° 13' to 32° 15' N

Longitude      77° 05' to 77° 10' E

In pursuance to the Hon'ble Supreme Court order dated 7<sup>th</sup> May 2010, the State Government issued intention Notification under section 18 of the Wildlife (Protection) Act, 1972 in respect of the Wildlife Sanctuaries and National Parks for which rationalization had been proposed and final notification of Manali Wildlife Sanctuary was issued vide HP Govt. notification No. FFE-B-F(6)-11/2005-II/ Manali, dated 7<sup>th</sup> June 2013 (Annexure-II)

Manali Wild Life Sanctuary forms a part of the catchments of Manalsu Nala, a tributary of Beas River and is situated in Kullu District of Himachal Pradesh between the above mentioned coordinates. The Wild Life Sanctuary consists of 2 demarcated forests with a total area of 29 Km<sup>2</sup> as detailed below:

2/5 Bangdwari    D.P. F.	=	1292.55 Ha
2/6 Manal Gahar   D.P. F.	=	1607.81 Ha
Total Area	=	2900.36 Ha

#### 1.2 Approach and Access

Located at a distance of 2 Km from Manali town, which is 40 Km from Kullu town, the District Headquarter. This Sanctuary is approachable from Chandigarh, Shimla and Pathankot and distances are as under:



Chandigarh – Manali (NH – 21)	=	308 Km
Shimla – Manali (NH – 22)	=	275 Km
Pathankot – Manali (NH – 20)	=	318 Km

Nearest Airport is at Bhuntar (10 km from Kullu) which is linked to Shimla, Chandigarh and Delhi. The nearest railway station is at Joginder Nagar (166 Kms) which is connected through a narrow gauge line with broad gauge rail network at Pathankot.

The approach to the sanctuary from Manali is via bridle path from Manali Log Huts or Dhungari Temple (Annexure- XIV) that passes through dense Deodar, Kail, Horse Chestnut, Walnut andle Forests.

The best period to visit the sanctuary is April to June and September to October as during these months the weather and visibility is suitable for spotting wild animals and birds and the higher reaches are also accessible.

### **1.3 Statement of Significance**

The sanctuary falls in the upper catchment of the Beas River and is located in Manali hills. Manalsu Nala which originates from the catchment of this sanctuary is the main source of water in Manali town. The Protected Area preserves a variety of Himalayan flora and fauna. The area comprises of vast stretches of alpine meadows and snow capped peaks which harbor a variety of flora and fauna to flourish in nature in its most immaculate condition.

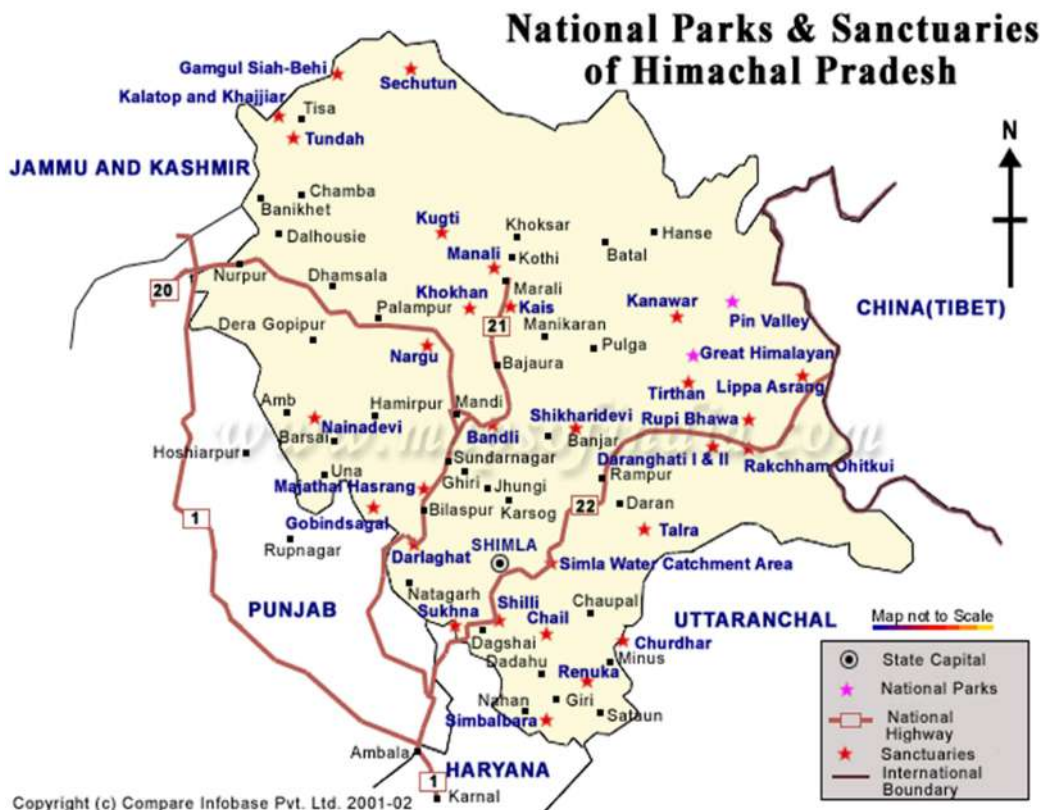
The natural and cultural richness of Kullu Valley coupled with its simple peace loving people with traditional hospitality makes the valley a most favored tourist destination. Anybody with a spirit of adventure and love for nature will find himself at right place in the pristine environs of temperate forests of the sanctuary. This sanctuary was notified for affording protection to the endangered “Musk Deer” as the area offers a good habitat for the deer species. It is worthwhile to mention here that there is no habitation/village inside the sanctuary so the interference caused by the humans is less as compared to the other wildlife sanctuaries.

The Manali WLS represents one of the few areas of semi-natural flora and fauna in the temperate, subalpine and alpine zones of the western Himalayas, an area of high species diversity. It provide shelter and protection to many rare and endangered species included in Red Data Book of IUCN and CITES appendices like Monal, Himalayan Brown

Bear, Himalayan Black Bear, Common Leopard etc. Sanctuary has high population of Greenish Warbler and Monal and their sighting is easy in Monalagahar beat which is named after Himalayan Monal. Floral species like Taxus, Hathpanja, and Nagchhatri are found in abundance at comparatively lower elevations. With its rich gene pool and variety of ecosystem functions and processes it provides ample research opportunities. Besides forming catchment of important perennial river Beas it provides ecological security and environmental amelioration in the region. It has got many educational and interpretational values to it.

Manali and its surroundings have always strived to provide better amenities to the tourists visiting the area (especially Manali- Lambdug- Manali Pass trek), so that they can enjoy its natural beauty and cultural heritage and now the protected area do also aim at providing additional infrastructure for the tourists and also to inculcate among the tourists, the respect for nature and wildlife.

Hence, the biological, Ecological, geo-morphological, watershed and scenic/ tourism values of Manali protected area make it an important bio-diversity and eco-tourism hot spot.



Source: mapsofindia.com

Figure 1- Location Map of Manali Sanctuary

## CHAPTER – 2

### BACKGROUND INFORMATION AND ATTRIBUTES

#### 2.1 Boundaries

The Manali WLS is defined by following boundaries:

**North:** Demarcation line of compartment V of 2/5 Bungdwari forest along point 3377mtr.

**East:** 1/1 Bajrundi demarcated forest and demarcated line of 2/5 BungdwariC1 and cultivation limits.

**South:** Banaun Nalla and demarcated line of 2/6 CIV Monal Gahr.

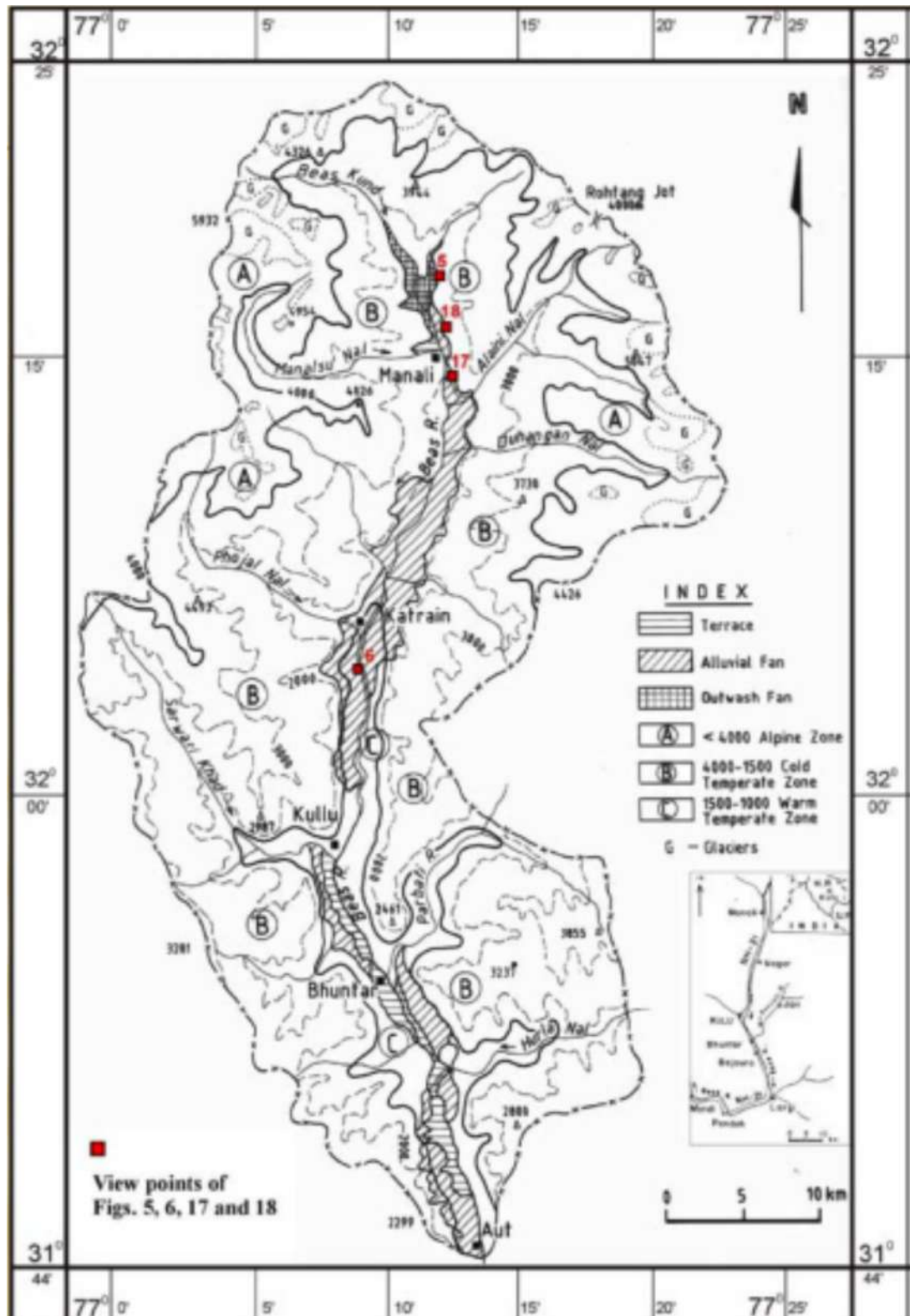
**West:** Natural limit of Forest upto demarcated line of compartment V of 2/5 Bungdwari forest

#### 2.2 Geology, Rock and Soil.

The underlying rocks in the sanctuary are mica schist, shale and quartzite. The parent rock is exposed at many places along Manalsu Nala and has precipitous slopes. In Monalgahrforestsoil is Mica schist, loamy, fertile and in Bungdwari it is Mica Schist, clayey shallow to deep.

#### 2.3 Terrain

The tract is highly undulating. Slopes are moderate to steep and precipitous. The pastures have the moderate slopes and such areas form a very less part of the protected area. The sanctuary is drained by the Manalsu Nala which forms the major drainage system of the area under Manali Sanctuary. Altitude of the sanctuary varies from 2030 meters near Manali to 4020 meter.



Location, General geomorphology and the various climatic zones of the Kullu Valley (Shah *et al.* 2006)

**Figure 2- General Geomorphology of the Kullu Valley**



## 2.4 Climate

The climate of the Protected Area is temperate.

### 2.4.1 Season

Four seasons experienced in Manali Sanctuary area as follows:

1. Summers are from mid April to June and may extend up to mid July.
2. Monsoon starts from mid July to mid September.
3. Autumn starts from mid November to mid December.
4. Winter extends between mid December to mid March but the season may extend due to some extensive rains and may be less i.e. shortened due to early summer and dry season.
5. The temperature varies from  $-10^{\circ}\text{C}$  to  $28^{\circ}\text{C}$ .

### 2.4.2 Rainfall Pattern and Distribution

Main source of water is snow that is received during winters viz., December to March. Much of rainfall is received during Monsoon season which is from July to September. The period between October to December is dry. Snowfall is very heavy during winters. Rainfall data is tabulated as follows:

#### 2.4.2: Monthly rainfall (mm) Data for Manali Sanctuary

Year	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
1999	103.4	35.2	56.2	2.2	71.7	39.9	164.2	131.7	37.3	4.3	0	0.6
2000	77.4	138.8	100.2	24.7	74.0	138.8	192.0	64.3	8.1	0	38.6	0.5
2001	27.4	27.7	112.8	84.9	59.0	67.3	138.4	104.1	25.1	0	54.5	75.9
2002	68.8	146.4	96.4	121.7	9.2	30.2	2.0	85.3	92.0	23.0	0	8.0
2003	50.2	181.1	166.7	73.4	55.4	46.9	73.6	82.5	72.2	0	33.1	52.8
2004	146.6	59.8	0	80.4	83.1	67.6	65.8	89.6	13.9	197.8	6.8	54.3

<b>2005</b>	88.4	284.3	211.6	15.7	63.4	52.5	245.4	46.1	118.3	1.6	0.5	0
<b>2006</b>	207.4	48.9	109.4	48.0	64.5	24.9	138.6	122.3	64.1	21.1	22.5	61.0
<b>2007</b>	1.0	233.4	240.8	5.2	55.2	67.3	125.3	135.7	32.3	5.0	0	25.0
<b>2008</b>	246.1	60.2	7.2	80.2	99.0	131.0	82.8	199.7	146.9	43.6	2.4	61.7
<b>2009</b>	26.9	51.3	69.0	89.8	30.9	31.9	30.2	131.9	131.3	1.3	81.1	7.2
<b>2010</b>	23.6	173.4	67.5	79.3	93.7	187.5	243.8	159.3	219.4	43.2	9.6	77.5
<b>2011</b>	38.2	186.1	117.6	165.4	52.7	93.1	75.5	296.4	72.7	134.1	42.6	43.4
<b>2012</b>	112.8	119.6	71.0	90.7	16.3	30.0	68.1	111.2	134.1	2.9	15.0	45.3
<b>2013</b>	89.1	253.7	119.1	47.6	24.0	111.5	118.6	62.8	42.6	4.7	18.1	29.0
<b>2014</b>	54.4	159.7	159.6	69.0	85.3	42.5	116.2	63.1	43.4	24.8	5.3	60.0
<b>2015</b>	84.2	246.6	178.5	126.1	79.9	107.0	156.9	118.6	65.0	17.8	32.0	42.8
<b>2016</b>	35.7	82.5	189.4	108.1	58.9	24.8	62.8	171.0	20.8	0	0	0
<b>2017</b>	177.9	85.2	100.0	119.2	73.7	143.6	84.9	46.4	74.4	0	16.2	44.6
<b>2018</b>	11.0	58.0	67.4	93.4	55.8	62.6	87.8	83.0	240.4	7.8	82.4	7.0
<b>2019</b>	130.9											

**Source:** Regional Horticultural Research Station, Seobagh

**Table2.4.1: Rainfall Snowfall data for Manali Sanctuary**

Month	2015		2016		2017		2018		2019	
	Rainfall (mm)	Snowfall (cm)	Rainfall (mm)	Snowfall (cm)	Rainfall (mm)	Snowfall (cm)	Rainfall (mm)	Snowfall (cm)	Rainfall (mm)	Snowfall (cm)
<b>January</b>	129.8	32	45.4	50	177.4	162	8.6	-	96.2	202.7
<b>February</b>	227.8	39.5	101.6	-	109.5	1.6	74.8	13	291.6	53
<b>March</b>	206.4	38.5	271.8	-	140.4	28	103.2	-	146	20
<b>April</b>	207.6	-	89.4	-	140.9	-	110.6	-		
<b>May</b>	69.2	-	39	-	49.8	-	79.2	-		
<b>June</b>	99.8	-	77.6	-	128.6	-	216.7	-		
<b>July</b>	306.5	-	180.4	-	256.8	-	369.8	-		
<b>August</b>	19.4	-	259.2	-	144.8	-	210.3	-		
<b>September</b>	96.8	-	43.8	-	160	-	433.2	-		
<b>October</b>	8.8	-	3.8	-	5	-	9.8	-		
<b>November</b>	48	-	-	-	38.2	-	111.2	-		
<b>December</b>	NA	NA	-	-	73.4	-	28.8	-		

Source: Atal Bihari Vajpayee Institute of Mountaineering and Allied Sports, Manali Himachal Pradesh.

### 2.4.3 Temperature variations

Maximum and minimum temperatures recorded at Manali are 30°C and -12°C. But the detailed recorded Temperature given below is recorded at RHRS, Seobag.

**Table2.4.3: Maximum Temperature (C°) Data**

Year	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2004	17.4	19.2	27.4	29.3	31.0	28.5	33.4	29.2	27.1	19.4	18.7	19.1
2005	13.8	14.8	20.7	24.8	27.6	33.1	29.4	30.4	28.6	26.9	22.2	18.5
2006	15.6	21.8	22.1	26.1	30.3	30.4	30.6	30.3	29.6	26.6	21.8	17.1
2007	18.1	17.0	21.7	29.6	28.9	31.9	30.2	30.0	30.2	28.0	23.4	17.4
2008	12.5	18.0	24.8	25.5	29.4	29.8	30.3	28.7	27.7	26.0	22.8	19.4
2009	17.3	19.4	23.0	26.6	28.7	33.1	32.4	31.1	28.1	26.9	20.7	17.1
2010	18.0	18.5	24.8	28.5	29.3	29.2	28.6	29.3	28.2	25.7	21.8	17.5
2011	15.2	15.4	22.8	24.5	30.1	29.7	30.3	28.7	28.9	26.7	23.0	18.1
2012	13.4	16.4	22.5	24.6	30.3	33.4	32.1	29.2	28.7	26.2	21.5	17.4
2013	15.4	15.7	23.1	25.0	31.2	29.4	29.8	29.6	30.4	27.7	21.8	18.0
2014	15.1	15.0	18.4	24.7	27.6	32.5	30.6	29.9	29.1	25.9	23.7	17.8
2015	16.0	18.0	20.8	24.4	30.3	29.3	29.8	29.4	29.9	27.4	22.6	18.2
2016	17.5	19.1	22.5	25.9	29.8	32.2	31.1	29.1	30.7	24.4	26.6	18.7
2017	13.6	19.4	21.5	27.2	28.8	28.5	29.5	29.4	29.0	27.9	21.2	18.5
2018	17.2	19.4	24.0	26.4	29.5	30.9	29.4	30.0	27.4	25.4	19.8	16.4
2019	12.9											

Source: Regional Horticultural Research Station, Seobagh

**Table 2.4.3: Minimum Temperature (C°) Data**

Year	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2004	0.4	1.8	6.6	8.6	12.3	15.4	16.5	17.5	16.2	7.3	4.1	1.5
2005	0.8	2.1	5.8	7.9	9.8	14.6	19.3	18.9	16.1	8.3	2.4	-0.3
2006	1.6	5.8	5.4	8.5	3.7	15.6	20.2	19.2	15.4	9.4	4.9	1.7
2007	0.1	3.5	4.0	10.7	12.4	17.1	19.7	20.0	16.5	8.5	3.6	1.0
2008	1.0	2.0	6.2	8.7	12.2	18.5	20.5	18.8	13.3	8.8	3.9	2.8
2009	3.0	4.3	6.0	8.6	11.1	13.8	18.6	19.3	13.7	7.6	3.3	1.2
2010	0.9	2.2	6.3	8.9	11.3	13.0	17.6	18.8	15.1	7.5	3.2	-0.7

<b>2011</b>	-1.3	0.9	4.0	6.8	11.0	15.1	18.3	19.3	16.0	8.9	4.0	0.2
<b>2012</b>	0.2	2.2	5.2	8.1	10.0	15.0	19.5	19.2	15.5	6.6	2.7	1.4
<b>2013</b>	-0.6	2.2	4.7	8.4	10.9	17.6	20.0	19.8	14.8	11.7	2.8	0.2
<b>2014</b>	1.3	2.1	5.1	6.7	10.5	13.5	19.2	19.2	15.2	9.6	3.6	1.1
<b>2015</b>	-1.5	1.2	5.5	9.1	11.4	14.6	19.8	19.3	14.0	9.3	4.7	-0.3
<b>2016</b>	0.9	2.7	6.7	12.6	13.0	17.9	20.8	19.0	16.8	9.5	4.6	2.5
<b>2017</b>	1.8	4.5	5.5	9.5	12.6	15.8	20.6	20.2	15.8	9.8	4.6	2.8
<b>2018</b>	0.4	4.6	6.5	9.3	11.4	17.3	26.5	20.7	15.7	7.2	4.0	0.4
<b>2019</b>	1.4											

Source: Regional Horticultural Research Station, Seobagh

#### 2.4.4 Humidity:

The data for humidity is tabulated as follows:

**Table 2.4.4: Relative Humidity data for Manali Sanctuary**

<b>Year</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>Aug</b>	<b>Sept</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>2005</b>	69.95	82.37	68.67	61.98	66.19	70.01	84.48	79.16	84.71	65.64	58.36	44.59
<b>2006</b>	66.45	58.83	60.54	61.36	77.58	76.51	88.29	88.83	81.98	67.20	64	68.64
<b>2007</b>	51.66	65.75	59.32	49.53	64.88	80	89.14	89.14	88.41	87.88	86.70	80.50
<b>2008</b>	86.98	76.10	53.04	56.83	76.75	88.78	91.01	92.98	88.41	87.40	76.53	71.08
<b>2009</b>	71.33	67.67	64.66	72.60	77.38	73.50	78.56	84.46	84.50	68.11	70.71	67.50
<b>2010</b>	67.37	72.66	69.16	75.93	71.79	78.63	82.11	88.61	88.78	79.30	74.45	71.48
<b>2011</b>	81.40	83.48	70.58	73.23	74.50	83.78	84.00	88.22	87.75	82.17	80.40	67.42
<b>2012</b>	80.00	80.82	64.19	72.90	61.42	64.53	77.55	89.40	86.52	80.66	79.53	78.58
<b>2013</b>	76.26	84.66	71.60	74.87	72.66	82.66	83.65	90.27	81.97	77.50	65.37	65.40
<b>2014</b>	74.03	79.20	77.24	65.28	75.48	75.42	85.25	84.11	84.76	77.98	63.38	68.39
<b>2015</b>	76.72	77.14	73.04	-	-	-	-	-	-	-	-	-

Source: Regional Horticultural Research Station, Seobagh

#### **2.4.5 Wind Speed**

There is no record of any high velocity winds or storms. The velocity of wind is not very high except at the hilltops.

#### **2.4.6 Drought and its periodicity**

Details of the drought and its periodicity have not been recorded. Generally the period from October to December is dry.

#### **2.5 Water Sources**

The sanctuary is rich in water resources (Annexure- XV), being blessed with snow cover and vast vegetative cover to hold water resulting in fine spurt of springs and other sources of drinking water, which enhance the habitat. Manalsu Khad, Brog Nala, Galayani Nala, Gulamlang Nala, Rebakan Nala all are perennial streams. Manalsu Nala is the major stream flowing through the sanctuary from West to East and finally joins the Beas River.

#### **2.6 Range of Wild Life, Status, Distribution and Habitat**

The Protected Area is home to a host of many endangered wild animals like Musk Deer, Ibex, and Western Tragopan. Other fauna in the sanctuary include Himalayan Black Bear, Himalayan Palm Civet, Barking Deer, Flying Fox, Goral, Indian Hare, Porcupine, Himalayan Yellow Throated Marten and Kashmir Flying Squirrel besides Monkeys and Langurs.

##### **2.6.1 Vegetation**

The area of Manali sanctuary stretches from 2030m to an altitude of 4020 m. It portrays a variety of ground configuration, varied climate and vegetation, providing a congenial habitat for temperate wild life. The sanctuary is rich in flora and fauna and has a wide range of plant species. It is a paradise for the biologists and a challenge to a mountaineer.

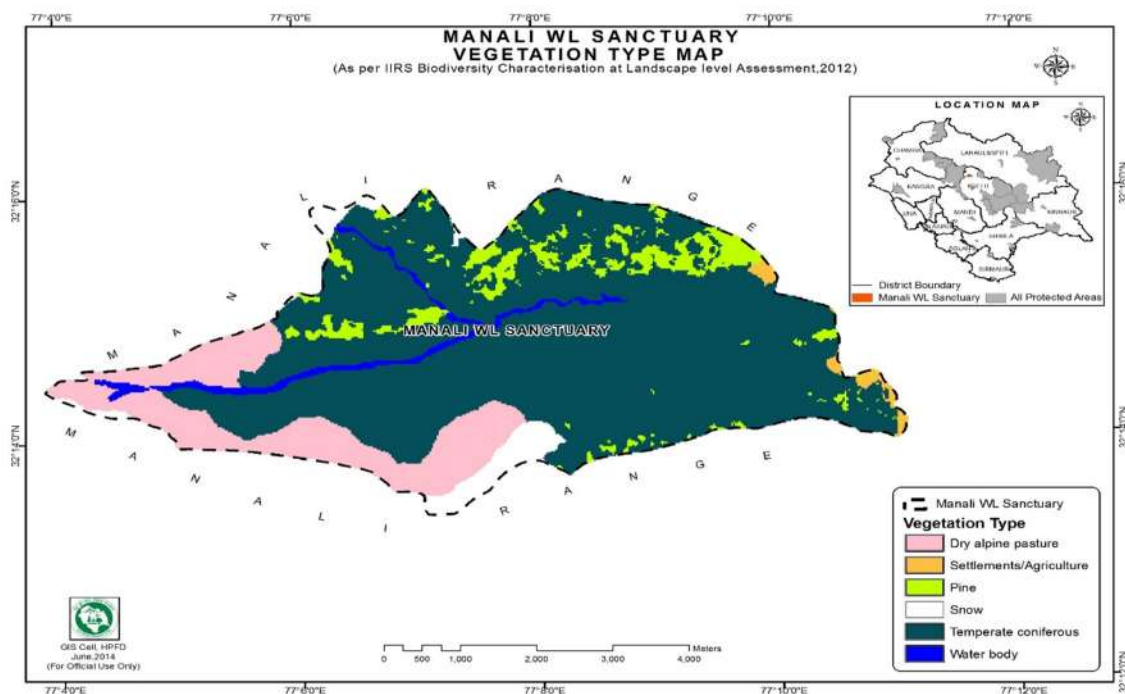


Figure 3-Manali WL Sanctuary Vegetation Type Map

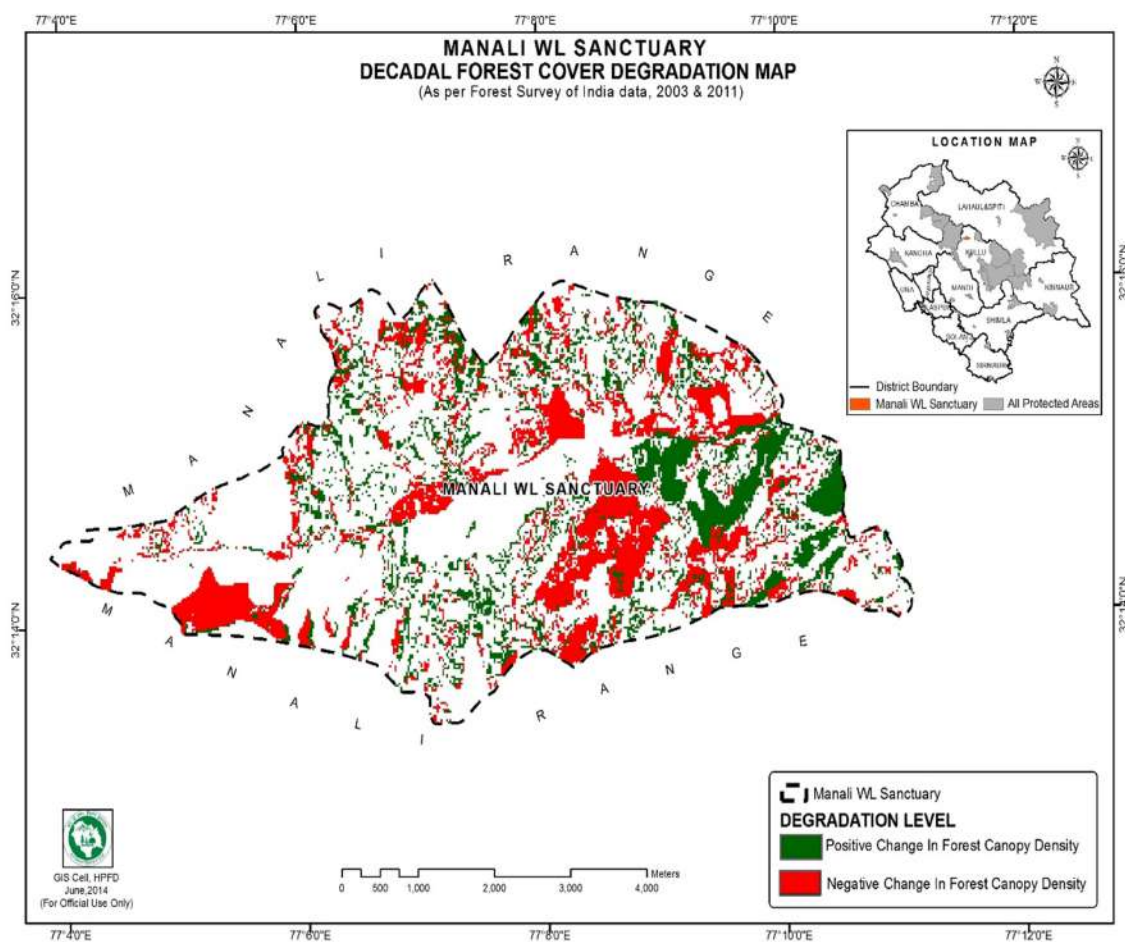


Figure 4-Manali WL Sanctuary Decadal Forest Cover Degradation Map

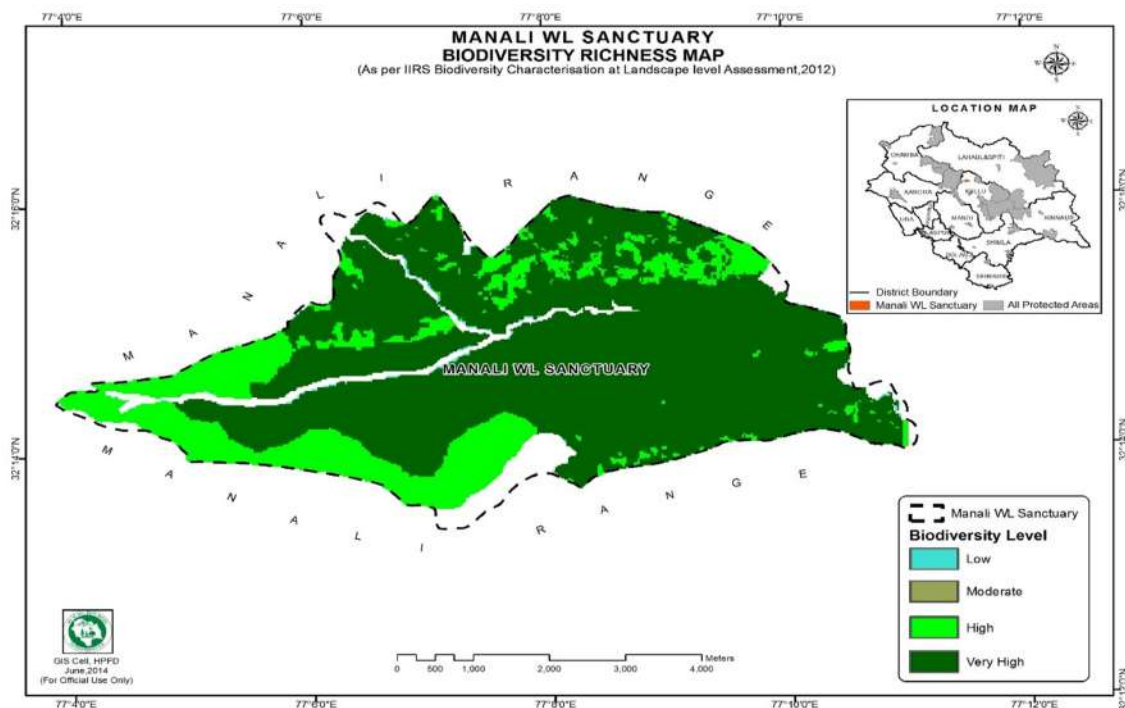
### 2.6.1.1 The bio-geographic classification

The topographic factors have a great influence on vegetation through their influence on climatic and edaphic factors that have a direct bearing on vegetation of a place. Among topographic factors is altitudinal variation, which ranges from 2030m to 4020m, is most prominent. The terrain is characterized by high ridges, deep gorges, cliffs and glaciers. Other topographic factors are configuration of land surface, slope, aspect and exposure. These all factors have an influence on temperature, wind movement, run off affecting erosion on steep slopes and deposition on relatively gentler slopes etc and thereby causing a wide range of vegetation to occur.

The general distribution of area based on the composition is given below:

- Area covered under permanent snow/glaciers = 35.0 Hectares
- Area under alpine pastures = 535.0Hectares
- Area under rock and cliffs = 210.36Hectares
- Area under grassland/thaches = 1470.0hectares
- Area under tree/bush cover = 650.0Hectares
- Area under cultivation = Nil

**Total =2900.36Ha.**



**Figure 5- Manali WL Sanctuary Biodiversity Richness Map**



### 2.6.1.2. The Forest Type, Cover and Food for Wild Animals

Following forest types according to Champion and Seth Classification are found inside the WLS:

- **12/C<sub>1c</sub> -Moist Deodar Forest:** This type of forest is found on either bank of Manalsu Nalla upto Upper Ruar in Bungdwari forest. Kail and Spruce occur in mixture with Deodar while in 2/6 Monal Gahar forest Deodar is found in mixture with either Spruce or Fir.**Upper Top Storey:** It consists of *Cedrella serrata*, *Juglans regia*, *Aesculus indica*, *Celtis australis*, *Prunus padus*, *Ulmus spp* etc.**Under growth:** Under growth consists of Indigofera, Gerardiana, Desmodium, Viburnum, Lonicera, Rubus, Berberis, Spirea, Rosa, Elaeagnus etc.**Ground cover:** Fragaria, Viola, Geranium, Salvia, Thymus, Visit himalayensis, Hedra helix, Clematis etc.

- ii **12/C<sub>1d</sub> -Western Mixed Coniferous Forest:** In Manali sanctuary this type of forest is met with above the Deodar zone (Plate:1). The main species are Fir and Spruce. Such forests are found above Upper Ruar in Bungdwari beat and in the Monal Gahar beat extending upto Lambadugh.

**Upper storey:** *Quercus dilatata*, *Prunus padus*, *Acer species*, *Aesculus*, *Juglans regia*, *Taxus baccta* etc.

**Under growth:** *Viburnum species*, *Sarcococca saligna*, *Strobilanthes*, *Rubus* etc.

**Ground Cover:** *Polygonum*, *Valeriana*, *Fragaria*, *Anemone*, ferns and grasses.

The crop is middle aged to mature. Regeneration is almost absent.

- iii **12/C<sub>2a</sub> -Kharsu Oak Forest:** These types of forests are found above Bajaun and extend upto Khanpari Thach in 2/6 Monal Gahar (Plate:2).

**Upper storey:** *Quercus semicarpifolia*, *Rhododendron*, *Cotoneaster*, *Prunus padus*, *Acer spp*, *Betula spp* are found in the top canopy.

**Iv12/DS<sub>3</sub>-Himalayan Temperate Pasture:**

These types of pasture are met with at Lamba dugh, Khanpari and Upper Ruar.

**Ground flora:** Ground flora consists of *Anemone*, *Potentilla*, *Fragaria*, *Daphenium*, *Trifolium*, *Primula*, *Ranunculus* and grasses etc.,

These areas are the summer grazing grounds for the local cattle.

**V15/C<sub>1</sub>- Birch/Rhododendron Scrub Forest:**

This type of forest is found above Lambadugh upto Dorni area and consists of *Rhododendron camapnulatatum* as main species with *Betula utilis* scattered.

**Under storey:** *Viburnum*, *Cotoneaster*, *Lonicera* etc.

**Ground Cover:** *Polygonum*, *Primula*, ferns and grasses.

Trees are stunted and short having curved trunks due to heavy snow pressure.

**15/C<sub>3</sub>-Alpine Pasture:**

Extensive grass lands above the tree line but below the line of perpetual snow are found in the sanctuary. Such pastures are met with in Galayani, Dorni, and Seri. Grass is the main vegetation with occasional presence of *Juniperous recurva* and *Rhododendron* species. The flora is very rich and rare, comprising of *Meconopsis*, *Potentilla*, *Primula*, *Delphinium*, *Aconitum*, *Podophyllum*, *Gentiana kurroo*. These pastures present scenery of unique grandeur and unmatched beauty with flowers of various hues tossing their heads in glee when they are in full bloom.

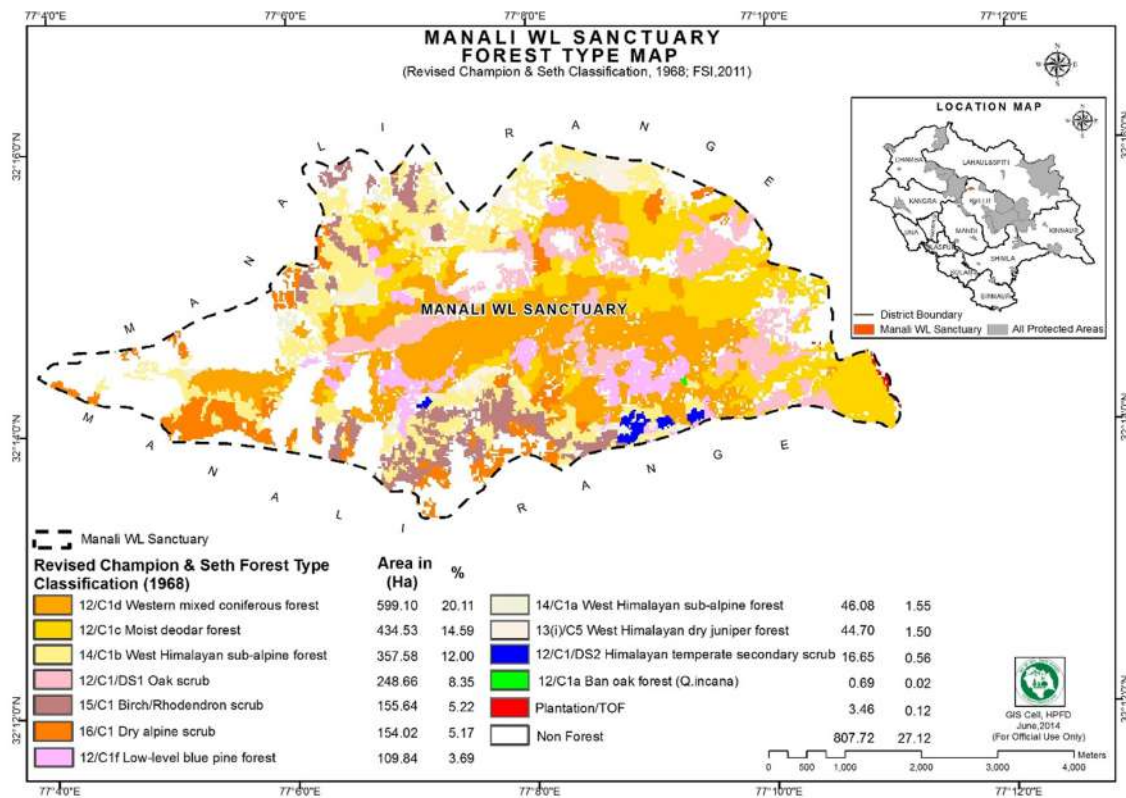


Figure 6- Manali WL Sanctuary Forest Map

Food is the primary obligation of any living being. Abundant quantity of food both for animals and birds is available in the sanctuary. Only portion of sanctuary near habitation is disturbed due to biotic interference and such areas are not fit for wildlife. For wild animals the biotic interference is a significant factor affecting shelter, nesting, food availability, hiding places etc. wild animals avoids such areas. The food source in the shape of grass and other biomass is present in abundance in the sanctuary except in winters when due to snow the animals move downwards for the food and shelter. Different herbivores prefer diverse food under different circumstances and therefore, nothing can be mentioned about the quality of the food available.

Available undergrowth is *Desmodium*, *Indigofera*, *Strobilanthes*, Ferns, *Polygonum*, *Spirea*, *Viburnum*, *Clematis*, *Cotoneaster*, *Balsam* and *Rumex* which all provides good forage, grasses, edible fruits and cover to the fauna.

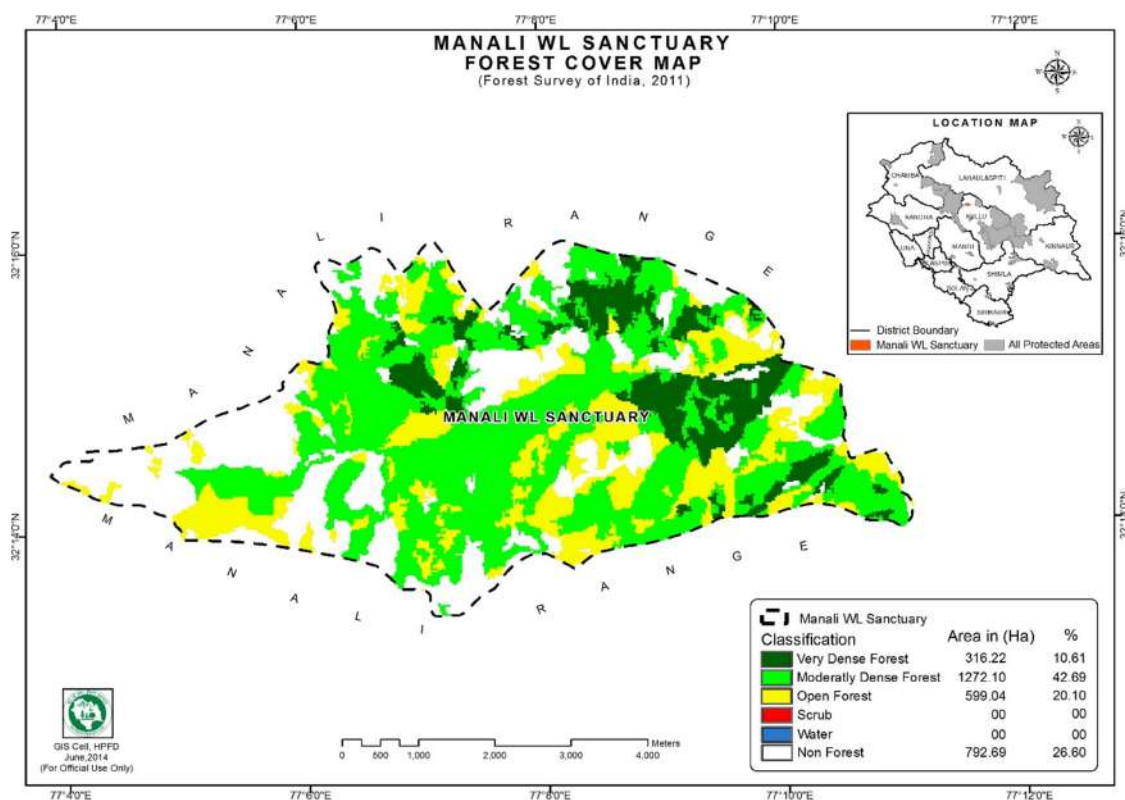


Figure 7- Manali Sanctuary Forest Cover Map

### 2.6.1.3 Species and Communities of Conservation Importance, Key Areas.

The Protected Area has forests of Deodar, Fir, Spruce, and Kail among conifers and has a wide range of broad leaved species as well. Among them are Kharsu, *Prunus*, *Acer*, *Juglans*, *Buxus*, *Rhododendron*, *Celtis*, *Betula*, *Ulmus*, *Aesculus* and other miscellaneous species forming the under storey.

Alpine area of the protected areas is rich in medicinal herbs. Some of the important commercial medicinal herbs (Plate:5) found in the sanctuary are given below:

1. Patish (*Aconitum species*)
2. Karu (*Picrorrhiza kurroo*).
3. Dhoop (*Jurinea macrocephalla*).
4. *Discorea deltoides*.
5. Salam Panja (*Dactylorrhiza hatarigera*)
6. Ban Kakri (*Podophyllum hexandrum*)
7. Nihanu (*Valeriana spp*)
8. Banafsha (*Viola spp*)

9. Sath Jalari (*Ainselia aptera*)
10. Swertia spp
11. Thallictrum spp.
12. Polygonatum verticilatum

Thus, there is an urgent need to keep constant vigil on maintaining and further propagating these herbs. Taxus leaves are commercially important. Its collection may have threatening effect on the species itself, but these are one of the most ideal habitats of the pheasants. However, collection of leaves and any other kind of herbs is not allowed from the sanctuaries at present, hence, is not a very serious threat as such. A checklist of flora (trees, shrubs, and herbs) is given as Annexure- III.

### 2.6.2 Animals

There is a great variation of altitude and flora in the sanctuary and for the reason it possesses many varieties of Himalayan Wild Life species. In the recent past, partial surveys were done which confirm the above facts. This sanctuary has been known for musk deer, which is an endangered species and is entered in the Red Data Book of IUCN.

The main wild life species (Plate:3) found in the protected area are:

Musk deer, Himalayan Black Bear, Ibex, Leopard Cat, Ghoral, Himalayan Yellow Throated Marten, Indian Porcupine, Flying Squirrel, Monkey and Langoor. Main avifauna are Monal, Koklas, Chakor, Snow pigeon, King-fisher, etc. Snakes and lizards are also found.

Check list of animals and birds are given as annexure- IV and annexure - V respectively.

**Table 2.7.2: The result of partial census carried out in the sanctuary**

Animal	2001-02	2002-03	2004-05	2012-13
Loepard	1	0	0	
Ghoral	2	0	0	
Monal	89	87	58	Density = 16.66/Km <sup>2</sup>
Himalayan Yellow Throated Marten	16	0	8	
Langur	63	102	30	
Black bear	1	0	0	

Eagle	1	0	0	
Flying Squirrel	3	2	7	
Pigeon	100	98	116	
Koklas	14	22	18	Density 6.82 Km <sup>2</sup>
Wild Rat	4	0	0	
Chakor	2	0	1	
Barking deer	0	6	2	
Jackal	0	3	3	
Kalij	0	5	0	
Baaz	0	6	4	
Mongoose	0	1	0	
Rhesus Monkey	0	32	14	
Jungle Cat	0	1	0	
Woodpecker	0	3	0	

Separate census for Monkeys and Langur were carried out in the protected area. The results are as under:

Date	Monkey	Languor	Total
16.12.2003	56	66	122
16.06.2004	-	20	20
16.12.2004	40	46	86
16.06.2005	21	37	58
29.06.2013	43	43	68

#### 2.6.2.1 Vertebrates, their status, distribution, habitats, habitat quality and key areas.

The Manali WLS is host to a variety of faunal species. It is a paradise for bird watchers. Wildlife sanctuary is famous for its variety of wild fauna. Musk Deer and Black bear are found in the protected area. Other threatened species found in the sanctuary are Brown bear, Yellow throated marten, Jackal, Porcupine, leopard, jungle cat, common fox, goral, barking deer, languor, and common flying squirrel etc.

Among the pheasants (Plate:4), Monal, Koklas and Kalij are found in the denser part of the forests. A lucky few may also have a glimpse of the Western Tragopan. One can hear the pheasants calling at daybreak. Western Tragopan (State Bird) that is highly threatened bird species is found in some parts of the protected area. There has been a

decrease in the population of this pheasant. There is an urgent need to protect them from disappearing. The pre-mating dancing ritual performed by the male Monals to attract the females is a treat to the eyes. Earlier, the pheasants were killed for the pot and crests. In traditional functions, it used to be very common to spot people wearing the crests on their hats. Of course, this practice is slowly declining now, due to socio legal aspects and the ban by the wild life regulations.

It is important to analyze the resources, available in the sanctuary in terms of habitat, which ultimately controls and regulate the wildlife and therefore, indicates the management of the protected area. Habitat can be analyzed in terms of space, food, cover, presence of other animals and climatic factors. Space a multidimensional factor is a primary pre-requisite for the well being of the wildlife. The length and width gives the extent of area available, thickness indicative of number of layers available for different species. The quality and quantity of each of these dimensions gives the idea of nourishment available to the wild animals. In this protected area the thickness is not limiting as middle storey shrubs and herbs are present. Animals do not spread randomly, but tend to cluster in a suitable habitat. Edges may not be prominent but are available to the fauna in the protected area.

These edges are between open lands and forest canopy, between middle storey and shrubs or may be any two different land uses, may also be called transition zone of acetone in ecological sense. Transition of two or more habitats may be viewed as an edge, and is very much desirable. Animals keep on moving in different areas. Habitat cannot be considered in terms of fixed locations. Animal population living in one area may migrate to another area for want of one or another resource. The animals themselves select an alternative and in this way a long term balance of available resources is maintained. The area provides an excellent habitat for large number of animals and also provides corridors to Nargu wildlife sanctuary. The sanctuary has available resources at various altitudes, which caters to the need of the animals during various seasons.

Dr. A.J. Garson and Dr. P.J. Garson undertook research on pheasants during the year 1979-90. This was in connection with the survey of this area to determine the feasibility of making a national park here.

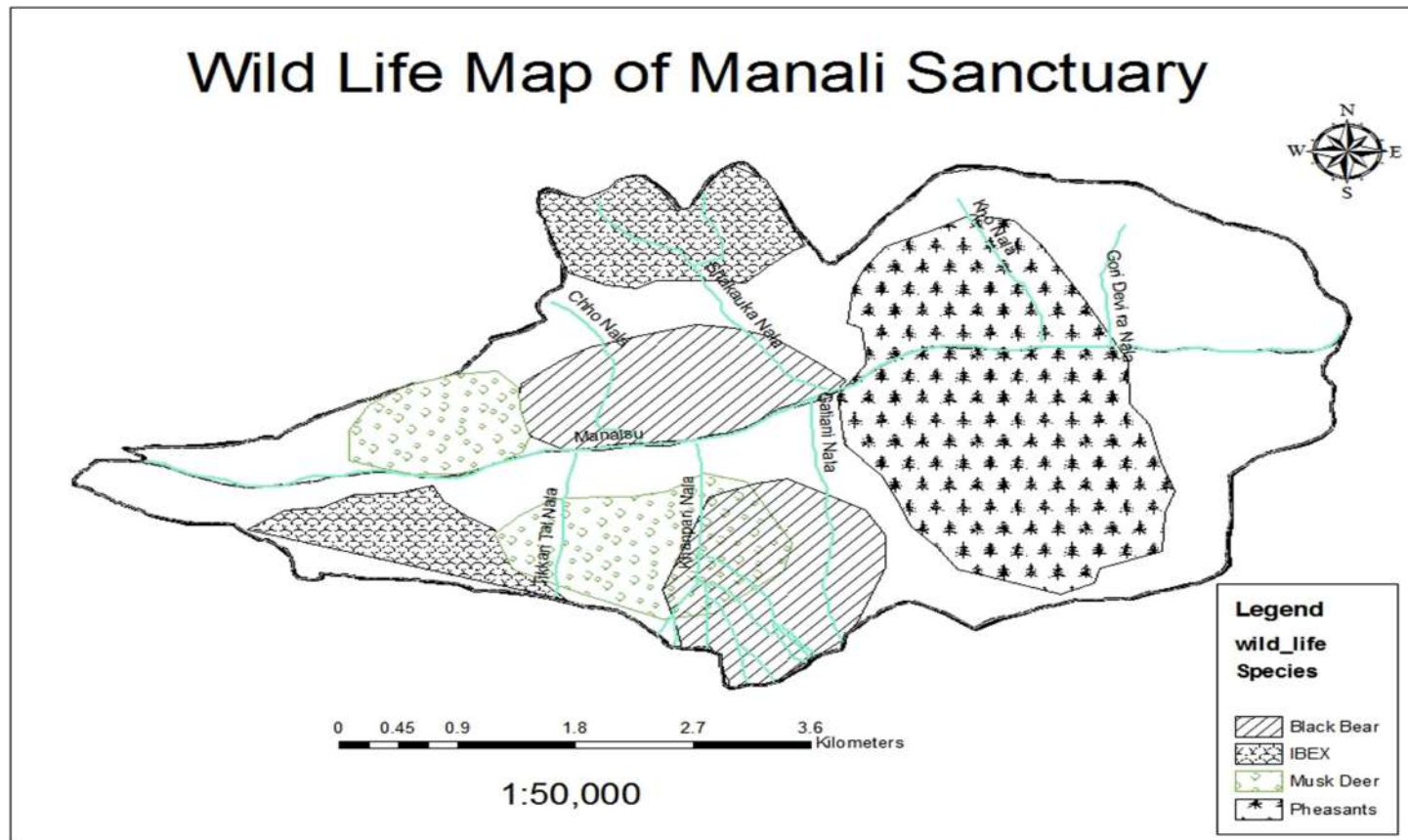


Figure 8-Wild Life Map Of Manali Sanctuary



#### **2.6.2.2 The Limiting Factors.**

Even sufficient food present may not be available for the wild life. The area above 3000m remains under the snow from November to March and therefore, even while the resources are present, they may not be available to the fauna. The shepherds in the past used to penetrate deep inside the sanctuary, thus scaring and squeezing the wild fauna to smaller niches which has now been rectified by the way of allotting grazing lands in the other territorial areas. Now only the parts near the habitations faces little disturbance due to various biotic factors.

#### **2.6.2.3 Important Invertebrates, their status, distribution and habitat.**

No study or survey has been conducted for invertebrates, their status and habitat. A variety of butterflies, moths, beetles and insects species are found in abundance in the sanctuary. Study/Survey of the invertebrates is required to be done in the future.

## CHAPTER – 3

### HISTORY OF MANAGEMENT AND PRESENT PRACTICES

#### 3.1 General

Scientific management of the forests in Kullu started in 1886 when Mr. Fishcer, DCF, prepared first working plan for the management of the forests of the Kullu district. Main emphasis was laid on Deodar, which was then considered a valuable species for export.

Mr. Trevor revised the working plan (2<sup>nd</sup> Working Plan) from 1915-1919. In his working plan he laid emphasis on uniform system of forest management. Four working circles were formed which were Regular Working Circle, Fir Working Circle, Selection Working Circle and Unregulated Working Circle.

The second revision of working plan was done by Mr. W.H.G. Samler from 1930 - 1934. The objectives of the management of this plan were the same as that in the previous working plan. Further, Sh. K.L. Aggrawal revised the working plan during 1947-1949. The number of working circles remained same. Sh. D.P. Kapoor did fourth revision of working plan (Fifth Draft Working Plan) which ended 1963-64. In this plan the working circles constituted were Regular Working Circle, Fir Working Circle, Protection Working Circle and Broad Leaved Working Circle. Selection Working Circle of previous Working Plan was abolished.

Sh. J.C. Sharma further revised the working plan (6<sup>th</sup> WP) for 15 years from 1979-80 to 1993-94. The forests of the sanctuary were allotted to the following working circles:

Fir Working Circle	=	436.99 Ha.
B/L Working Circle	=	65.62 Ha.
Protection Working Circle	=	2397.75Ha
		-----
		2900.36Ha
		-----

In J.C. Sharma Working Plan, following silvicultural systems were prescribed for the forests included in the Manali Sanctuary:

**Punjab Shelter Wood System:**

This system was prescribed for Fir Working Circle, which constituted of 436.99Ha area in Bungdwari and Monal Gahar forests. Under this system, felling was permitted on the basis of configuration of ground and retention of mature growing stock as advance growth.

**Selection System:**

This system was applied to Broad leaved working circle. Under this system all valuable B/L species were to be worked. Trees of exploitable diameter were prescribed for removal. Thinning and improvement felling were also to be carried out to favour young crops of valuable species – artificial regeneration was also prescribed to supplement the natural regeneration in suitable areas. Under this system 65.62 Ha of Monalgahar forest was covered in J.C. Sharma's Working Plan.

In the past Working Plans, low emphasis was laid on scientific management of wildlife and with the establishment of separate wild life wing in 1985, special emphasis has been given to protect and enhance the wild life habitat that has yielded significant results. Increase of wild animals and birds has been noticed since then and since imposition of complete ban on hunting in the year 1986. The sanctuary was under Wildlife Division, Shimla and then Palampur, till creation of Wild Life Division Kullu during the year 1984. The complete control of this sanctuary was handed over to DFO Wildlife Kullu along with other sanctuaries to respective Wildlife division vide H.P. Govt. Notification No. S.C. – A(1)1/83-Vol.II dated 26.08.1986.

Manali WLS was constituted by Punjab Government vide Notification No. 70 GP 53/97 dated 28.02.1954 under Punjab Wild Birds and Wild Animals Protection Act 1933 with an area of 29.00 sq. km. The Manali WLS was again rationalized vide GoHP Notification No. FFE-BF(6)-11/2005-II/Manali dated 07.06.2013 under Wildlife (Protection) Act, 1972 with an area of 29.00 sq. km. Manali WLS was managed by Kullu Wild life division since June 1984. Earlier management plan was prepared for five years from 2000-01 to 2004-05. The previous management plan (10 year) was prepared by Sh. B.S. Rana, IFS, DFO WL Kullu from 2004-05 to 2013-14.

### **3.2 Timber Operation including Bamboo and firewood harvest**

#### **3.2.1 Silvicultural System and Tending Operations**

The forests in this sanctuary are strictly protected and preserved to maintain flora and fauna and no silvicultural operations like tending or thinning are undertaken. However, biotic pressure is there as discussed in the previous paras. The right holders continued to enjoy their rights recorded in the forest settlement till March, 2004. At present all such rights have been suspended in pursuance of the guidelines issued by MoEF & CC. The forests are being managed with the objective of providing best possible habitat to the wildlife. The working plan prescriptions are not in force.

#### **3.2.2 Even aged system and uneven aged system**

Main objective is protection. Hence, no silvicultural system is applied.

#### **3.2.3 Bamboo Working**

Bamboo species except hill bamboo (*Arundianaria* spp) are not found in the forests of Manali WLS and no commercial harvesting is carried out.

#### **3.2.4 Firewood Harvest and collection**

There is no commercial extraction of firewood from the sanctuary. Only dead trees and twigs were collected for firewood by the local right holders in the past. Valley remains under snow for 4 to 5 months and people burn fuel wood in ovens during winters and with the increasing population of migrant labour in the valley, the protected area and other forests are affected by the demand for fuel wood extraction. No special impact study of fuel wood collection from Protected Area has been conducted. This activity has definitely affected the habitat of wildlife, especially around the villages. Impact of this activity has been felt up to 2 kilometer from the villages depending upon the accessibility and terrain of the area. However, during recent time due to easy availability of LPG and other alternate fuels, the dependence on fuel wood has reduced considerably.

### **3.3. Non – Wood Forest Produce (NWP) Collection**

The right holders were permitted in the past to remove roots, flowers (Plate:6) and grasses etc. free of charge, in accordance with the rights allowed in the Forest Settlement

Report of Kullu. There are variety of plants and herbs which are of great value. These are generally used for their medicinal values. At present, the collection of these plants and herbs has been suspended in the protected area.

Main Non timber forest produce found in the sanctuary are medicinal herbs. Various drugs are derived from different parts of the plants. Most important medicinal herbs that are available in the sanctuary are *Jurinea*, *Aconitum*, *Viola*, *Gentiana kurroo*, *Morchella*, *Acorus* etc. The complete control of the sanctuary was given to wildlife wing in 1987. Since then no export of medicinal herbs has been done from the sanctuary.

### **3.4 Leases**

There is no lease area inside the sanctuary.

### **3.5 Other Programmes and activities**

To create awareness among the masses, nature awareness programmes /tours are conducted. During these tours the participants are taken to various sanctuaries and zoos. Lectures on wild life subjects are delivered to the students and other people. Every year wild life week is celebrated in the 1<sup>st</sup> week of the October during which various competitions are organized so as to create wild life awareness among the students and folks. The programmes and activities undertaken during last six years are given below:

### **3.6 Forest Protection**

#### **3.6.1 Legal Status**

With a view to conserve diverse wildlife available in the state, the Government of Himachal Pradesh has declared 26 sanctuaries, 5 National Parks, and 3 Conservation Reserves covering all the agro-climatic zones in the state and having significant ecological, geo-morphological and bio-diversity.

A wild life sanctuary is established under sections 18-26 of the Wild Life (Protection) Act, 1972 and admits rights to the extent as allowed by the Collector at the time of the settlement in concurrence with the Chief Wild Life Warden of the State. Finally notified boundaries of the Wild Life Sanctuaries cannot be altered without resolution of the State Legislature. General public is legally restrained from destroying, exploiting or removing any wild life from the sanctuary, or destroying or damaging the habitat of any wild animal, or depriving any wild animal of its habitat in the sanctuary.

The Manali Wildlife Sanctuary was notified vide Punjab Govt. Notification No. 70-GP-53/07 dated 26<sup>th</sup> February 1954 under the Punjab Birds and Wild Animals protection Act, 1933. The matter with regard to the issuance of Notification under the Wildlife (Protection) Act, 1972 was examined by the Administrative Department in consultation with the Law Department. It had been opined that there is no need to declare areas of Manali, Kais, Khokhan and Kanawar Sanctuaries again as sanctuaries under the Wild Life (Protection) Act, 1972 as these sanctuaries were rightly declared as sanctuaries under the Punjab Act and the operation of Wild life (Protection) Act, 1972 which is a central act and in no manner affects the constitution of the said sanctuaries. A copy of the letter No. FFE-B-F(6)-11/99 dated 16/10/1999 addressed to the Chief Wildlife Warden H.P. by the Commissioner cum Secretary (Forests) to the government of H.P. in this regard is attached as Annexure -VII . No settlement of rights and concessions had taken place and residents continued to enjoy their rights and concessions as per settlement report by the Anderson in the year 1896 till March 2004 when MoEF & CC had directed the State Government to stop exercise of rights enjoyed by the local people in the Protected Areas. The matter with regard to the rationalization of the Wildlife Sanctuaries and National Parks in Himachal Pradesh was under the consideration of the Hon'ble Supreme Court of India in IA No. 139/2010 in Writ Petition Civil NO. 337 of 1995 titled Centre for Environmental Law, WWF-I Versus Union of India and others. In the pursuance to the Hon'ble Supreme Court order dated 7<sup>th</sup> May 2010, the State Government issued intention Notification under Section 18 of the Wildlife (Protection) Act, 1972, in respect of wildlife sanctuaries and National Parks for which rationalization had been proposed. The Hon'ble Supreme Court vide order dated 05/08/2011, further directed the State Government to follow the procedure laid down under section 18 to 26A and 35 of Wildlife (Protection) Act 1972 before issuance of final notification under section 26A of the Wildlife (Protection) Act, 1972. The Hon'ble Supreme Court vide order dated 01/02/2013 passed in IA No. 155 (earlier IA No. 139/2010), has permitted the State Government to issue final Notifications under Section 26A, 35(4) and 36A of the Wildlife (Protection) Act, 1972 with regard to the proposed rationalization of boundaries of the Wildlife Sanctuaries and National Parks in Himachal Pradesh. The Governor of Himachal Pradesh under section 26A of the Wildlife (Protection) Act, 1972 declared an area of 29.00 Km<sup>2</sup> of Manali as "Manali Wildlife Sanctuary" vide Notification No. FFE-B-F(6)-112005-II dated 7<sup>th</sup> June 2013 for the purpose of protecting, propagating and developing wildlife and its environment. The

rights of villagers admitted in the two 2<sup>nd</sup> class forests of this protected area along with general record of rights in 2<sup>nd</sup> class protected forests in Kullu are given in Annexure - VI.

Recently a proposal to declare Eco- Sensitive Zone around Manali Sanctuary has been submitted. The eco-sensitive zone is situated at the periphery of Manali Wildlife Sanctuary and encompasses an area of 15.68 Km<sup>2</sup>. The area will act as an important buffer for many important rare wild flora and fauna found in Manali Wild life sanctuary.



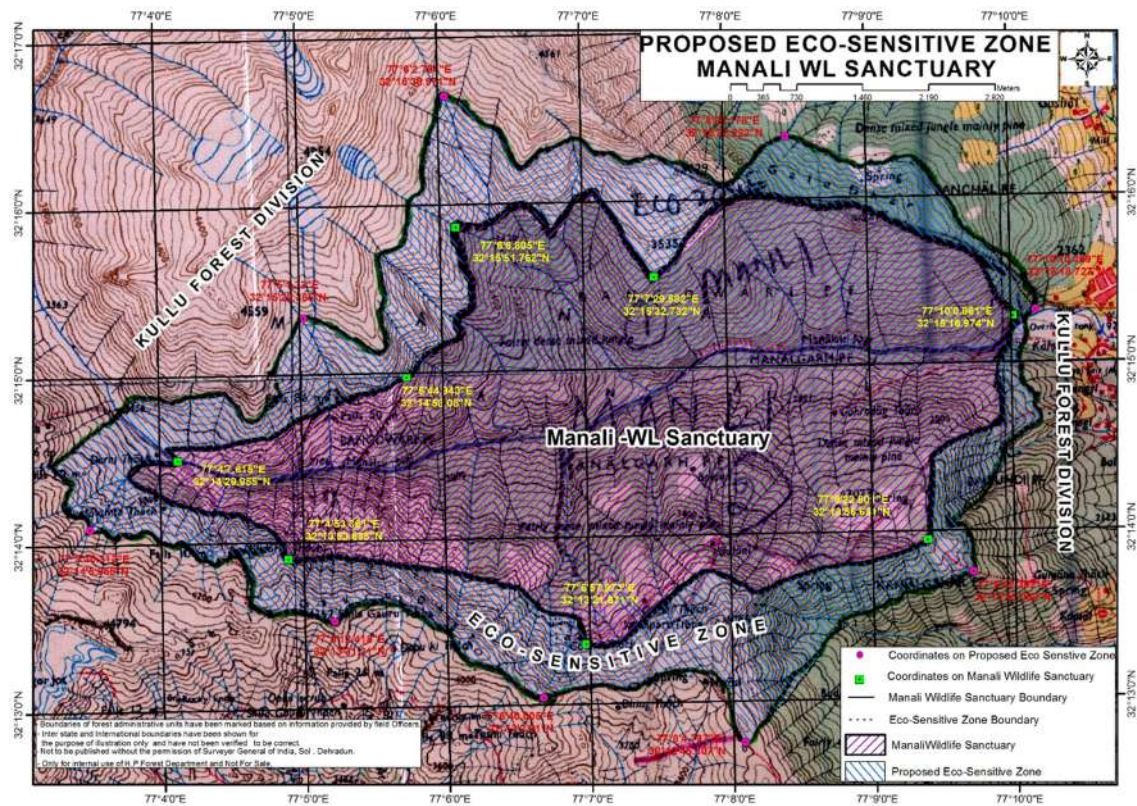
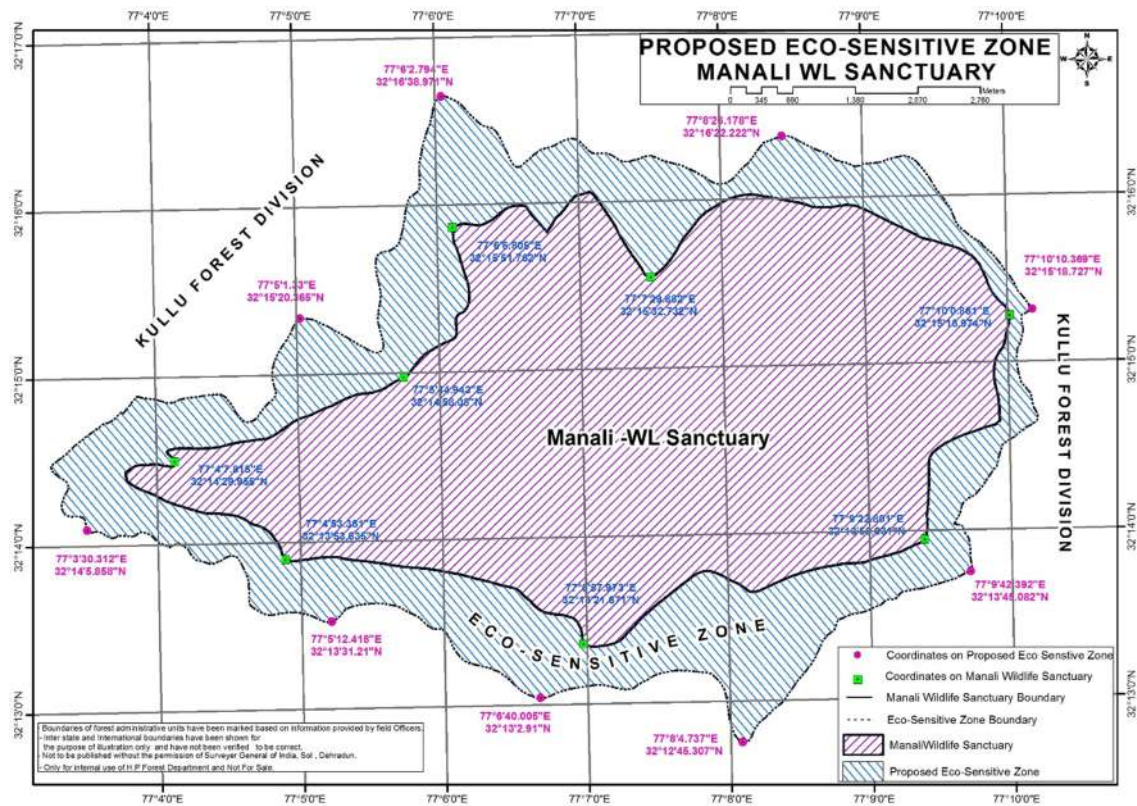


Figure 9- Proposed Eco-Sensitive Zone Manali WL Sanctuary



### **3.6.2 Hunting**

The area being a notified wildlife sanctuary, no hunting licenses were issued in the past though there was provision of granting the hunting license under Wildlife Act, 1972. The population of wild animals is at ecologically sustainable level and no major human-wild animal conflict was noticed, hence no hunting license has been granted in the past.

### **3.6.3 Illegal Activities**

#### **3.6.3.1 Poaching**

There is no organized poaching of wildlife in the sanctuary. Grant of arms license in and around sanctuary area is being closely monitored. Stray incidences of poaching cannot be denied. Wildlife is vulnerable to poaching during snowfall, as animals and birds are forced to move lower elevations for food and shelter. No poaching incidents have been noticed/reported in the Protected Area during the last five years. This could be as a result of awareness programmes and anti-poaching activities undertaken by the department.

#### **3.6.3.2 Illegal Cutting of Trees**

No organized illicit felling of trees takes place in the protected area. Very few cases of illicit felling have been reported since 1987. Stray cases of illicit felling do occur, that too for the bonafide domestic use by the villagers. No major case(s) of felling occurred during the last five years.

#### **3.6.3.3. Illegal Removal of NWP, Encroachment and other illegal Activities**

There is no reported case of illegal extraction of non-wood products from the sanctuary. The right holders who had rights in the past, to collect non-wood forest produce do bring some plants for the domestic use. No commercial extraction of non-wood forest products is done from the protected area.

The incidences of illicit felling in the sanctuary are rare. The right holders, to meet with their bonafide domestic requirements of fuel wood, fodder and cattle beddings sometimes do take away lops and tops of bushes and trees. These incidents are not in the alarming proportions. The sanctuary is surrounded by forestland on all the sides. Therefore, there has been lesser threat on account of encroachments. In fact, the sanctuary is free from encroachments.

### 3.6.4 Livestock Grazing

The local right holders had been allowed to graze their cattle, sheep and goats in the past as per their rights recorded in the Settlement Report. Grazing cause problems to wildlife such as:

1. Competition for food.
2. Disturbance.
3. Transmission of diseases
4. Soil Erosion.
5. Increase in the quantity of unpalatable grasses and weeds.

Illegal grazing is occasionally a problem in the area as stray cattle from in and around the protected area graze inside the sanctuary mixed with the cattle of right holders, thus, disturbing the wildlife. This problem is being eradicated with the enforcement of guidelines received from the MoEF & CC regarding suspension of rights.

**Table- 3.6.4 Cattle Population in the villages around the Protected Area**

<b>Sr No</b>	<b>Name of Village</b>	<b>No. of Households</b>	<b>No. and category of livestock</b>						
			<b>Cow</b>	<b>Bull</b>	<b>Horse</b>	<b>Sheep</b>	<b>Goat</b>	<b>Yak</b>	<b>Total</b>
1	Manali	469	1500	30	12	900	300	10	2752
2	Dhungri	88	132	15	0	102	0	3	252
3	Nasogi	146	172	8	0	470	300	0	950
	<b>Total</b>	<b>703</b>	<b>1804</b>	<b>53</b>	<b>12</b>	<b>1472</b>	<b>600</b>	<b>13</b>	<b>3954</b>

No grazing permits are issued for grazing of cattle in the area. Yaks shown above have been kept by the locals for giving joy ride to the tourists and are not taken to the protected area for grazing. Generally, the people of the villages situated outside the sanctuary send their redundant cattle to the forests at night especially during rainy season. They remain unattended and forest staff is forced to remove them out of the sanctuary and some cattle also become prey to the wild animals.

### 3.6.5 Wild Fires

Forest fires are rare in Manali sanctuary. The sanctuary falls in the temperate and sub-alpine zone. There are perennial stream/nallas in the area. Due to a high moisture regime of the area, the fire incidences do not take place in the protected area. Moreover, staff and the firewatchers engaged to keep a close watch on any incidence of fire are deployed during fire season.

### 3.6.6 Insect Attack and Pathological Problems

Insect damage is sporadic and does not assume the form of an epidemic. Mainly *Ectropis deodarae*, *Euzophoro cedrela* damage deodar trees and seedlings. *Brachyxychutes subsigrates* attacks the new shoots of silver fir.

The fungi like *Trametes*, *Fomes anosus*, *Peridermium cedrii* attacks Kail, Deodar, and Spruce. They cause heart rot in the trees. Others like *Barcayella*, *Deformens*, *Fusarium* attack spruce cones, current shoots and roots of the Deodar seedlings.

### 3.7 Tourism

Nestled in the Western Himalayas, the State of Himachal Pradesh offers unlimited opportunities to one and all to enjoy nature in its most pristine state. The very mention of the International hill resort Manali instantly evokes images of the mighty Himalayas with lofty snow capped peaks, meandering rivers, perennial springs, vast stretches of alpine meadows and lush green forests known to harbor a variety of the plants and animals. Manali Sanctuary is located adjacent to the famous tourist resort Manali. This sanctuary is a heaven for nature lovers, wildlife enthusiast and trekkers. The majestic coniferous trees from an enchanting backdrop to the mountains with broad leaved species like oaks, maples, bird cherry, walnut, horse chestnut and rhododendrons adding grandeur to the landscape. The vines hanging atop seem to invite the visitors with open arms.

Important treks in the sanctuary are Manali to Bara Bhangal (70Kms), Manali to Solang Nala (via Seri 35 Km) and Manali to Patli kuhl via Khanpari (25 Km). Every year around 200 trekkers, both foreigner as well as Indians visits the sanctuary.

The State's wild life potentials have until now remained out of the reach of the tourists mainly due to lack of infrastructure. Most of the tourism, till now, is limited to the towns, with occasional trip to the nearby forests and other easily accessible attractions. Unaware of what they are missing, the tourists wander amongst the shops and restaurants

not much different from their native places. Many a nature lovers and wild life enthusiasts do not find opportunities to their taste, and have a hasty retreat from the State. There is immense potential for attracting visitors in this sector by providing functional conveniences.

### **3.8 Research, Monitoring and Training.**

#### **3.8.1 Research and Monitoring**

No scientific research has been carried out in the Manali WLS. However, general study of habitat has been done and local staff monitors various factors affecting it. Census of wild animals and birds has also been undertaken in recent years.

#### **3.8.2 Training**

For field staff, regular training/refresher courses are being conducted by the Forest training Institute Chail and Sundernagar. In addition to it, a number of workshops and training are imparted locally by inviting experts from outside to refresh and enhance the technical knowhow. Exposure visits for the field staff to various protected areas within and outside state are regularly organized to make them aware about good management practices being adopted in different PAs. Awareness programmes have also been organized among villagers to highlight the importance of the wildlife.

### **3.9 Wild Life Conservation Strategies and their Evaluation**

A natural environment is self-renewing, self-perpetuating and self-sustainable, in which every organism contributes in some way, howsoever small, to the overall sustainability of the ecosystem. In natural eco-systems, the plants and animals have evolved at their own pace and in their own ways under the influence of various climatic factors through the principle of natural selection and have created self sustaining habitats and micro habitats or niches. Over the years, ecological balance has been achieved and maintained.

The term wildlife applied to all biotic elements that comprise every species of plants and animals in the world, excluding man and his domesticated pets. But in practice, the term has become a fashionable coin giving value to a certain limited number of species of spectacular animals that enjoy public recognition. India has a rich heritage of wildlife as well as a long history and tradition of the conservation. Human beings and wildlife co –

existed in nature as long as man was not a dominant organism. At present Wildlife all over the world is vanishing rapidly due to growing influence of humans over resources. The pressure of increasing living standard, along with an unprecedented growth of the human population and commercial exploitation have been the prime causes for the declines of the wildlife in almost all the countries. Man has ruthlessly destroyed nature in search of food, water, shelter and connectivity. As a result, the formerly secure wildlife habitats have been depleted and fragmented. This has caused wild animals to enter into human habitations and destroy crops in search of food. Damage to property, dwellings and human life is not uncommon. This leads the rural people to ponder whether it is reasonable to conserve wildlife. In reality, it is extremely necessary to have a plan for peaceful co-existence with nature and natural life for the development and progress of human beings. The destruction of any form of life affects the human race itself. During the past centuries, man has never walked such a path of self-destruction as in the latter half of the 20<sup>th</sup> century.

In the present scenario, protection is the foremost objective and the area is intensively patrolled to check depletion of the protected area's biological heritage. Footpaths and local paths are the only way to guard the area (Annexure- IX). Soil conservation measures have favorable impact on conserving and checking further erosion of the precious top soil.

Works of pasture development, improvement and plantation of near extinct medicinal herbs by involving local people has yielded a desirable result in improvement of wildlife habitat. Joint Forest Management and eco-development has played an important role in raising awareness among villagers. A sense of self restriction and self discipline among villagers has evoked a complimentary effect on conserving, maintaining and enhancing flora and fauna.

### **3.10 Administrative Setup**

The sanctuary is governed by the rules and regulations prescribed by the State Government. The sanctuary is under the administrative control of the H.P. Forest Department (Wild Life Wing), Govt. of H.P. The Chief Wild Life Warden-cum- Pr. C.C.F. (Wildlife) with HQ at Shimla, exercises the overall technical and administrative control. Manali WLS falls under the jurisdiction of Wildlife Division Kullu which under the

control of GHNP Circle at Shamshi. The Manali WLS is managed by D.F.O. Wild Life with HQ at Kullu through the Range Forest Officer, Wildlife Range Manali. The detail of the staff posted in Manali WLS is as follows:

RFO, Wildlife Range Manali	= 1 No.
Deputy Ranger/ BO Manali	= 1 No.
Forest Guards (Bangdwari & Monalgahar Beats)	= 2 No.

The sanctuary consists of a single block (Manali Block) which is divided into beats namely 2/5 Bangdwari and 2/6 Monalgahar. Whenever required, camping equipments are made available to the field staff which includes sleeping bags, tents, cooking utensils, GPS, binoculars etc which has been kept in the Range office. The administrative map is attached.

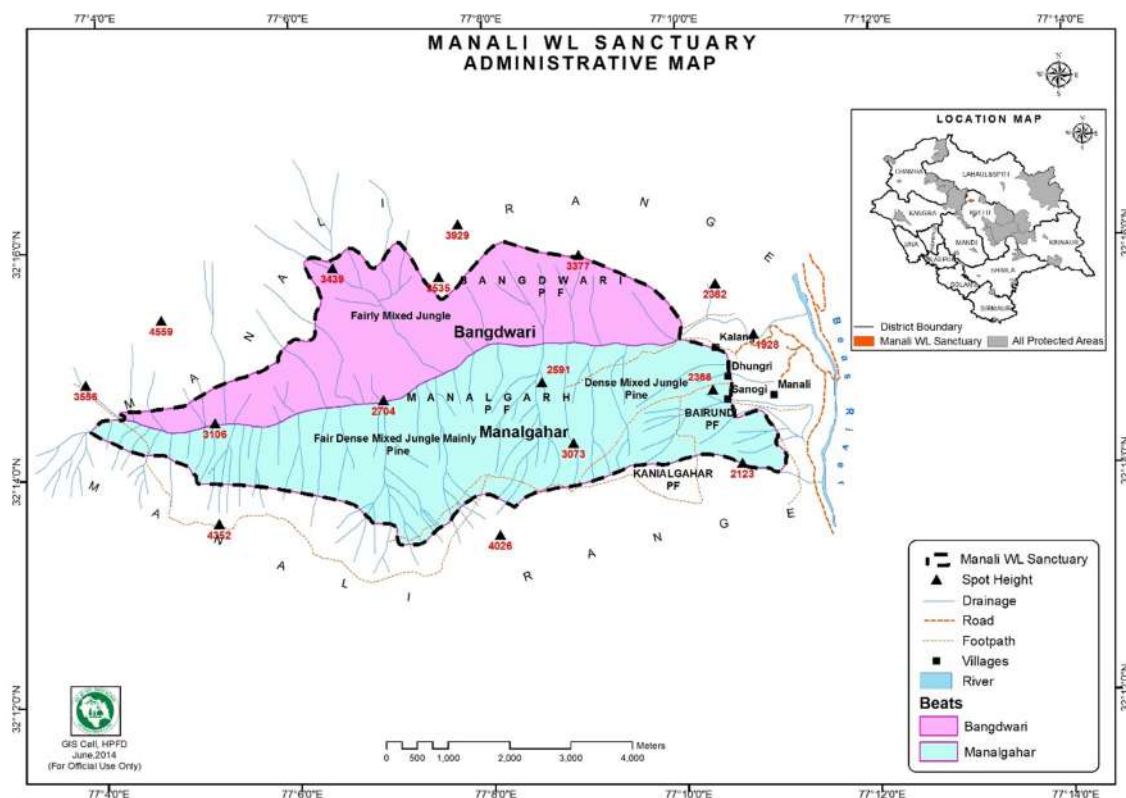


Figure 10- Manali WL Sanctuary Administrative Map

### 3.11 Communication

Communication system is almost negligible, as no telephones are available. Mobile signal is seen only at certain places inside the sanctuary.

### **3.12 Summary of the treats to the wildlife**

The major factors, which are threatens the wildlife in Manali WLS, can be listed as below:

- i. Scarcity of food during the winters.
- ii. Communicable diseases transmitted through cattle.
- iii. Snow and avalanches.
- iv. Disturbance during the breeding season
- v. Floods and Soil erosion.
- vi. Hunting and poaching

## **CHAPTER – 4**

### **THE PROTECTED AREA AND THE INTERFACE LAND USE SITUATION**

#### **4.1 The existing situation in the zone of influence**

The state has a long history of sustainable co-existence with its wildlife resources. People have over the years found use of more than 600 local plants for their health care needs and for obtaining food, fruit, fiber, fodder, fuel, gum, oil and resin etc. from the wild. These plants contribute substantially to the rural livelihood. The State Government, in appreciation of these intimate rural livelihood linkages, has allowed the local communities to use these usufructs from all the forest except those which are reserved under the Indian Forest Act, 1927 and those which are constituted as National parks and Wildlife Sanctuaries under the Wildlife (Protection) Act, 1972. Dwindling populations of wild animals have increased since imposition of total ban on hunting during the year 1984. The intensification of agriculture coupled with increased human interface in hitherto undisturbed areas has led to greater human-animal conflict.

##### **4.1.1 The location, extent, boundaries and natural attributes of the Zone of Influence**

With inhabitants living in and around the sanctuary having recorded rights for bonafide use of natural resources, there are marked zones of influence. Since ages the villagers are largely dependent on these forests for their livelihood and thereby their rights have been recorded / protected in settlement reports. There are a number of seasonal and year around activities marking the zone of influence in the protected area. The activities of grazing, fuel wood collection and grass cutting and fodder collection are generally concentrated within two kilometer radius from the adjacent villages to the forest. Alpine pastures are occasionally grazed during summer months. Sheep and goat remain in these alpine pastures in summers and move to lower elevations during winters. The alpine pastures comprising of 230 ha area are sometime also under pressure on account of removal of commercially important medicinal herbs. Fire incidents though, not very frequent are mostly ignited intentionally to enhance the growth of grasses makes out a striking zone of influence around the villages. These fire incidents are unmanageable in difficult hilly terrain. The people of the adjoining villages are hostile towards the existence of the sanctuary due to tough regulations imposed. Protected area being popular with



trekkers, locals make some earnings while working as porters, guides and by providing mules for carriage of luggage.

**4.1.2 Villages inside and outside the protected Area, Ethnic identities, traditions, customs, relationship between distinct group of people and forest.**

There is no village situated inside the protected area. But, there are three villages/hamlets outside PA adjoining its boundaries. These three villages around the sanctuary have a marked impact on the protected area. The population figures of these villages are tabulated as below:

**Table 4.1.2- Human Population in the villages adjoining Manali Sanctuary.**

Village	No. Of Families						General		SC		ST		OBC		Total		G.Total
	Gen	Another	SC	ST	OBC	Total	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	
<b>Nsogi-1</b>	40	11	25	3	0	79	19	18	57	50	6	4	0	0	82	72	<b>154</b>
<b>Nsogi-2</b>	106	58	57	6	5	232	115	111	76	72	11	13	11	8	213	204	<b>417</b>
<b>Manali</b>	358	0	111	0	0	469	659	712	222	227	0	0	8	3	889	945	<b>1834</b>
<b>Dhungri</b>	3	0	75	0	10	88	16	12	113	132	0	0	16	18	145	162	<b>307</b>
<b>Total</b>	<b>507</b>	<b>69</b>	<b>268</b>	<b>9</b>	<b>15</b>	<b>868</b>	<b>809</b>	<b>853</b>	<b>468</b>	481	<b>17</b>	<b>17</b>	<b>35</b>	<b>29</b>	<b>1329</b>	<b>1383</b>	<b>2712</b>

Since ages the locals had an intimate relationship with the adjoining forests of the PA. The villagers directly depend upon the forests for fuel, timber and livestock grazing. The three villages/hamlets mentioned in the table above create a zone of influence on the protected Area. Through eco-development plans and equitable distribution of basic resources, the pressure is required to be minimized which is essential for the success of the plan.

In the villages, there are only two castes namely Rajputs and Scheduled castes. The residents of these villages are dependent on the protected area for fuel wood, livestock grazing and mushroom collection (guchhi) etc. Rajput, the dominant community has comparatively large landholdings and is agrarian. They strictly observe caste customs. They also rear sheep and goats. Hand looming is their part time profession for weaving woolen shawls, blankets and tweed for warm clothing. Scheduled castes have comparatively smaller land holdings and they also practice agriculture. They are generally poor and deprived lot. Besides agriculture, they also undertake other activities like working in orchards, working with trekking parties and in tourism sector.

#### **4.1.3 The state of people's economy, vocations, land use, use of forest and non-forest based natural resources by people and seasonal patterns.**

General economic condition of the majority of households in the area is good. Horticulture is the main occupation. Tourism is the second major sector contributing to the people's livelihood. Manali is one of the few places where natural beauty and climate attracts tourists, who contribute to the earnings of the locals. The other activities supplementing their income are:

1. Agriculture
2. Wage earning in orchard and tourism
3. Cattle rearing
4. Collection of guchhi (few)

The size and appearance of fields vary according to the slope. People cultivate superior cereals of wheat with coarse cereals and minor millets. Most of the land being under horticulture crop, agricultural activity is less.

##### **4.1.3.1 Non forest based natural resources**

As mentioned above, main occupation of the inhabitants is horticulture and tourism. Apart from horticulture, the other crops raised are wheat, maize, finger millet,

potato etc. The land use pattern of the two main villages adjoining the protected area is as under:

**Table 4.1.3.1 - Land Use Pattern**

Sr. No.	Name of Phati	Horticultural land (Bighas)	Agricultural Land (Bighas)	Other Type of Land (Bighas)	Total Area (Bighas)
1	Manali	1727.16	450.19	646.70	2794.05
2	Nasogi	2070.07	403.10	420.07	2893.24

Thus, horticulture is dominant occupation in the villages. The main horticulture crops are apple and plum while others being apricot, cherry and pears. Honey is collected in country made boxes on small scale and does not contribute to the sizeable earnings. Milk and milk products are produced in the area but they are mainly consumed locally and contribute very little to their earnings. Some People have government jobs but the main sector providing employment remains horticulture. Almost every household has a hand driven loom locally known as “Khaddi” to weave woolen cloths, shawls, and blankets mostly to meet their own requirements. The raw material for it is obtained from goat and sheep rearing.

#### **4.1.3.2 Use of Forest Based Natural Resources**

Most of the livestock is of local breed. The cattle from the adjoining villages sometimes graze inside the protected area throughout the year, except during the months when area is snow covered. Gujjars (migrant grazier) too bring their cattle to the surrounding thaches/ pastures during summers when milk products are in high demand. No impact study has been conducted in this regard in the protected area. The people have started rearing improved breed of cows recently which are stall fed thus, reducing pressure on the protected area.

Wool is used for weaving in almost every household and it is a part time activity, adopted by the locals. Shawls, caps and mufflers, the products of local handloom are famous all over India for their good quality and geometric designs. Many people make a sizeable earning by making these handicraft products.

Despite of the suspension of rights, the local residents sometime collect fuel wood from the forests of protected area. Forests are the primary source of fuel wood. Majority of the fuel wood is collected by them from the forests outside the sanctuary. Other sources like agriculture and horticulture residue fulfill only 25 per cent of their total requirement for fuel wood. Of late, due to easy availability of LPG, the demand for fuel wood has decreased considerably. No impact study of fuel wood collection has been carried out and this activity has been found to degrade the un-demarcated forests in the vicinity of the villages. The impact is visible and felt up to two kilometers in the vicinity of the habitations.

The residents of the nearby villages have recorded rights for timber. Now the Timber Distribution Rights has been suspended inside the PA and no tree has been distributed under Timber Distribution Scheme to right holders since 2004-05.

The right holders also collect grasses for hay making from the forests during the months of October and November for feeding their cattle in the winters when the area remains under the snow.

#### 4.1.3.3 Seasonal Activities

The table given below shows the seasonal pattern of use vis-à-vis the primary activities in which the people are occupied throughout the year:

**Table 4.1.3.3 – Seasonal Activity Calendar**

<b>Month</b>	<b>Activities</b>				
	<b>Agriculture</b>	<b>Horticulture</b>	<b>Forestry Operations</b>	<b>Herb Collection</b>	<b>Tourism</b>
<b>Jan</b>	-	Pruning etc.	Forest protection, plantation and census, anti-poaching.	-	
<b>Feb.</b>	-	New Planting	Forest Protection, plantations, anti-poaching	-	
<b>March</b>	-	Spraying	Forest protection	Guchii Collection	
<b>April</b>	Harvesting and sowing	Spraying	Forest Protection	-do-	

	of Kharif crops				
<b>May</b>	Harvesting and sowing	-do-	Forest protection, nursery works, trekking	-	
<b>June</b>	Weeding	-do-	Forest protection plantation, nursery work	-	
<b>July</b>	-	-	Forest protection plantation, nursery work	-	-
<b>Aug.</b>	-	Harvesting	Forest protection, plantation	-	-
<b>Sep.</b>	Harvesting	Harvesting	Forest protection, soil conservation	-	
<b>Oct.</b>	Sowing of Rabi crops	-	-	-	
<b>Nov.</b>	-	-	Forest protection	-	
<b>Dec.</b>	-	Pruning, pitting works, manuring	Forest protection, census, anti-poaching	-	

#### 4.1.4 Implication of the land use and resource dependency for the conservation of PA

People over the years have been using the natural resources and forests for their health care needs, timber, food, fiber, fodder and fuel etc. The forests of the protected area contribute marginally to the rural livelihood. Much has been said than done on the detrimental effects of the resource dependency of right holders on the environment, more so while referring to the effect on the wildlife. The threat to the sanctuaries continues unabated. Human greed backed by an unabated pressure of human population is taking its toll on the green reserves and it is a fact that conflicts in the protected areas do not occur in isolation and is reflective of our larger socio-economic-political reality.

In the Manali Sanctuary, with its extremes of weather conditions, the animal species in order to maintain adequate and viable populations in the suitable eco-zones needs the presence of large and contiguous habitat. Larger animals such as Bear and Ghoral and Pheasants that migrate to lower altitudes during winters and are in desperate need of areas where they are free from biotic interference. Fortunately, the villages are less

in number and livelihood sources being in plenty and involving less hardship, the villagers do not look towards the forests inside the protected area as source for generating income. People's interference in the sanctuary is restricted to approachable places only whereas the larger stretches are still available for the wildlife to multiply and prosper.

#### **4.1.5 Forest/PA management practices and their implication for the people**

The geographical area of the Manali sanctuary includes demarcated protected forest only. The private land belonging to people is generally surrounded by the un-demarcated protected forests, which maintains distance of villages/hamlets from the demarcated forests or reserve forests. Similar situation lies in whole of the Kullu district as considerable stretches of UPFs were left around villages to absorb the pressure of human and cattle population, at the time of forest settlement dating back to 1886. The expenditure for the management of the sanctuary is being borne by the State government and Government of India. The state Government provides fund for pay and allowances etc. whereas Government of India has been providing funds under "Assistance for development of National Parks and Sanctuaries" for the activities such as improvement of habitat, infrastructure development, purchase of equipment and eco-development etc. Also funds are being provided under Koldam CAT Plan under CAMPA. All the rules and regulations applicable to the protected areas is being followed in letter and spirit, which lately had not been so conducive towards winning people's co-operation, more since their rights were suspended.

#### **4.2 The development programmes and conservation issue**

An equitable distribution of basic resources will have to be recognized as pre-requisite to the success of the conservation plans. Consulting people living in villages around the sanctuary was a key activity of the plan development process during which consultations were held in all the villages in the area. Preparation of this plan has been centered on multi-stakeholder approach including local participation and public involvement. Development programmes encouraging participation and ultimately addressing the conservation issues have been included.

##### **4.2.1 An evaluation of government and non-government agency programmes for development, implications for the PA, people and zone of influence (ZI)**

The government programmes run by other departments in the villages have been quite successful. These programmes were beneficial for the sanctuary as the successful

implementation of various schemes of other departments diverted focus of the communities towards the activities dependent on sources other than the forest resources. Non-government organization active around Kullu town too have been contributing significantly towards the forest conservation and preservation of environment, particularly in the field of maintaining hygiene of the forests inside and outside the protected area. Manali sanctuary being so close to the famous tourist place Manali has to face many problems. The impact of wildlife related activities too, executed by the department has gone a long way in improving the habitat.

#### **4.2.2 The interplay of the market forces and their impact on the subsistence economy of the local people**

Local products like fruit, vegetables, shawls, caps, mufflers and dairy products have a good market created by the tourists and locals, fetching good income.

#### **4.2.3 A summary of the problems faced by the people that affect the management of the PA & the ZI.**

There were no significant problems faced by the people that had adverse bearing on the management of the Manali wildlife sanctuary but it is not so at present. Though, the people had been facing more restrictions on exercise of rights in the forests of the protected area, yet they were used to it and had not much to complain about. The abrupt cessation of their rights now has made us to lose their concern and cooperation for conservation related issues and friendliness. Fortunately, this is not so serious here as in the other protected areas where people were more dependent on the forests.



# **Part – II**

## **The Proposed Management**

## **CHAPTER – 5**

### **VISION, OBJECTIVES,ISSUES AND PROBLEMS**

#### **5.1 The Vision**

To protect, conserve and improve wildlife habitats. Improving and sustaining healthy living conditions through conservation of bio-diversity, protection of environment, soil, water etc. and empowering local people, women and other weaker sections of the society through scientific, transparent and responsible methods.

#### **5.2 Objectives of management**

The main objectives of management of the sanctuary are:

1. To preserve and propagate the existing wildlife by elimination of the decimating and limiting factors.
2. To strengthen the capacity building among the staff and community through the need based trainings and exposure visits.
3. To educate and inform the community and visitors, understanding wild life values and needs of conservation.
4. To minimize the biotic pressure and to arrest the degradation of the habitat.
5. carry out scientific studies in respect of habitat improvement, proper watershed management for soil and water conservation activities and other data based studies.
6. To inspire the community for eco-tourism and eco-development based on conservation of the natural resources of the sanctuary and provide income generating avenues.

#### **5.3 Problems in achieving objectives**

The recorded rights for fuel wood, fodder, timber, collection of Non Timber Forest Produce and grazing etc. in the sanctuary had been major problems in achievement of the objectives. Suspension of rights is feared to be a major problem in achieving the objectives which require people's participation. Public attitude towards conservation of wildlife is not favorable as some times damage is caused by the wild animals especially monkeys to their

crops. Lack of scientific knowhow, wildlife trained staff, equipment, lack of awareness regarding wildlife conservation among local people, lack of scientific data for the management of the sanctuary etc. are the constraints which hinders in the proper implementation of the management plan.

Manali Wildlife Sanctuary with a vast area with varied ecosystems and considerable community interface is bound to have its share of problems and limitations. From the detailed Inventory reports, research findings and field visits and discussions with staff, the problems faced or likely to be faced in achieving management objectives were determined for each objective separately. In the light of the previously mentioned objectives, a detailed problem analysis was carried out. Major problems for achieving different objectives are as follows:-

SN	Objective	Problems/constraints to achieve objectives
1	To preserve and propagate the existing wildlife by elimination of the decimating and limiting factors.	<ol style="list-style-type: none"> <li>1. Resource dependency of people in and around sanctuary on the resources of PA.</li> <li>2. Livestock grazing and possible disease outbreaks in wild animals.</li> <li>3. Various other protection related problems like NTFP collection, illicit felling etc.</li> <li>4. Repeated fires especially in the grasslands called locally as 'Ghasnis'.</li> <li>5. Remoteness of the areas and difficult terrain.</li> <li>6. Poaching and hunting especially during winter months by the local people.</li> <li>7. Overburdened staff is also one of the problems because as staff is involved in eco-development activities, eco-tourism etc. protection part get neglected sometimes which is the main pre-requisite to achieve this objective.</li> </ol>
2	To strengthen the capacity building among the staff and community	<ol style="list-style-type: none"> <li>1. Lack of adequate budget for realizing this objective.</li> <li>2. Overburdened staff at Manali wildlife sanctuary.</li> <li>3. Shortage of specialized resource persons for knowledge exchange and guidance.</li> </ol>

	through the need based trainings and exposure visits.	
3	To educate and inform the community and visitors, understanding wild life values and needs of conservation.	<ol style="list-style-type: none"> <li>1. Inadequate funds, logistics and manpower.</li> <li>2. Lack of infrastructure and interpretation center for nature education.</li> <li>3. Manali sanctuary doesn't have a nature shop with all the informative and interpretive stuff at reasonable price.</li> <li>4. Shortage of specialized resource persons.</li> <li>5. Lack of any systematic Awareness programmes.</li> <li>6. Poor community involvement/awareness.</li> <li>7. Ineffective communication between different agencies and stakeholders.</li> <li>8. Remoteness of the region and improper road connectivity.</li> <li>9. No proper waste management system.</li> <li>10. Absence of proper ecotourism management plan.</li> </ol>
4	To minimize the biotic pressure and to arrest the degradation of the habitat.	<ol style="list-style-type: none"> <li>1. Various problems like poaching, Private arms and ammunitions with locals.</li> <li>2. Repeated fires in grasslands.</li> <li>3. Inadequate funds, logistics and manpower.</li> <li>4. Patrolling and monitoring system is not appropriate and needs improvement.</li> <li>5. Inadequate capacity building programmes for the frontline staff.</li> <li>6. Inadequate and Improper communication and transportation facilities for emergency situations.</li> <li>7. Local Stakeholder participation is minimal. Lack of support from regional NGOs.</li> <li>8. Absence of local youth training programmes for facilitating in human wildlife conflict situations.</li> </ol>
5	To carry out scientific studies	<ol style="list-style-type: none"> <li>1. Inadequate funds, manpower and infrastructure.</li> <li>2. Patrolling and monitoring system is not appropriate and</li> </ol>

	in respect of habitat improvement, proper watershed management for soil and water conservation activities and other data based studies.	<p>needs improvement.</p> <ol style="list-style-type: none"> <li>3. Inadequate capacity building programmes for the frontline staff.</li> <li>4. Inadequate research in various aspects related to rare and endangered species and lack of adequate baseline data.</li> <li>5. Appropriate awareness programs with respect to various rare and endangered floral and faunal species.</li> <li>6. Resource dependency of local people for various NTFPs.</li> <li>7. Inadequate monitoring of various species of flora and fauna.</li> <li>8. Manali wildlife sanctuary forms catchment for a Manalsu Nala tributary of River Beas. The efforts for protection against grazing, fires, encroachments etc. are not organized properly leading to the deterioration in the catchment capability up to a certain extent.</li> <li>9. The land use in and around Manali sanctuary is not well regulated. Lot of runoff of pesticides, fertilizers etc. from the orchards is degrading the water quality.</li> <li>10. Repeated fires in grasslands.</li> <li>11. Resource dependency of local people for various NTFPs further deteriorate the catchment capabilities of the area.</li> <li>12. Lack of research on various aspects like detailed mapping of perennial sources of water with their watersheds, ground water surveys, mapping of geological formation for springs etc.</li> <li>13. Difficult conditions like remoteness of areas, lack of adequate road network, difficult terrain and language barriers etc.</li> </ol>
6	To inspire the community for eco-tourism and eco-development based on conservation of	<ol style="list-style-type: none"> <li>1. Inadequate funds, logistics and manpower.</li> <li>2. Lack of infrastructure and interpretation centre for nature education.</li> <li>3. Shortage of specialized resource persons.</li> <li>4. Lack of trained and motivated staff.</li> <li>5. Lack of adequate staff and untimely transfers of</li> </ol>

	<p>the natural resources of the sanctuary and provide income generating avenues.</p>	<p>implementing officers.</p> <ol style="list-style-type: none"> <li>6. Lack of proper coordination between various line departments.</li> <li>7. Ever increasing population also impacts the resources and further worsens the situation.</li> <li>8. Lack of sufficient awareness among the members about the concept of eco-development and its objectives.</li> <li>9. Non- acceptance of eco -development concept within the forest department resulting in inadequate support from within the department.</li> <li>10. Absence of mechanism to link the programmes with district administration and lack of awareness among district administration and political groups about eco-development programme.</li> <li>11. Inadequate institutional mechanism for growth of programme. It all depends on the individual.</li> <li>12. Preoccupation of staff with familiar works.</li> <li>13. Lack of any systematic Awareness programmes.</li> <li>14. Poor community involvement/awareness.</li> <li>15. Ineffective communication between different agencies and stakeholders.</li> <li>16. Remoteness of the region and improper road connectivity.</li> <li>17. No proper waste management system.</li> <li>18. Absence of proper ecotourism management plan.</li> </ol>
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## **CHAPTER – 6**

### **THE STRATEGIES**

#### **6.1 Boundaries**

The existing boundaries of the Sanctuary enclose two second class Demarcated Protected Forests i.e. 2/5 Bungdwari and 2/6 Monal Gahar and each forest constitute a beat namely Bungdwari and Monalgahar. All the activities proposed for development of the sanctuary are equally important in each beat. However, Monalgahar beat has slight edge over the other in terms of its use by visiting trekkers. The trekking route to Bhara Bhangal area of the district Kangra passes through this beat. The sanctuary forms part of the catchment of the Manalsu Nala. The area in the North of the Sanctuary is potential habitat of snow leopard, Himalayan Ibex and brown Bear.

#### **6.2 Zonation and Zone Plan**

Whole of the sanctuary comprises of one block namely Manali Block. This block is further divided into two beats Bungdwari and Monalgahar. Bungdwari beat falls on the left bank of the Manalsu Nala and Monalgahar on its right bank. This administrative division with the names of corresponding beats will be the zones for implementation of various works during the present plan. There is no need to prepare a separate zone plan for the sanctuary as the area of the Manali WLS is small.

The activities though common, yet being slightly different in each of the two beats, have been planned to be carried out. Since, the villages are situated outside the sanctuary but are not too far away, eco-development works have been proposed to promote the involvement of the villagers in the management of the sanctuary.

#### **6.3. Theme Plans**

In recent past, wildlife management plan and eco-development schemes have been prepared but could not be implemented holistically for want of funds. In most such programmes, however, local people have been left out of the conservation planning process. As a result, their aspirations, fears and rights have not been understood, or catered

to. In this plan emphasis has been laid on gaining the support of the people who live around protected area. Ensuring alternative and reliable supply of fuel and fodder has been proposed in this plan, so that villagers are not forced to enter protected areas for their simple needs. So, far in most of such programmes, local people have been left out of the planning process. This is the main reason that most of the wildlife conservation programmes have received little support of the people who live around Manali WLS.

The goal of this plan is to conserve and protect the significant biodiversity of the sanctuary. The plan will improve the protection of the wildlife from the human-activity based threats. The objectives have been kept in mind while proposing the activities to be undertaken. Various theme plans have been developed for taking care of some of the important aspects of management. Various theme plans proposed in the management plan are as under:

- 6.3.1 Protection Plan
- 6.3.2 Habitat Management
- 6.3.3 Watershed Management
- 6.3.4 Human Wildlife Conflict
- 6.3.5 Fire Management

Wild Life Health Care

#### **6.3.1 Protection Plan:**

To provide protection to the entire eco-system of the sanctuary, it is very important to address the activities related to protection of the flora and fauna of the area. As the threat from local people, poachers, illegal encroachers and other miscreants cannot be ignored, the protection constitutes one of the most important aspects of the wild life management. Protection precedes conservation. Hence it is very important to organize practically applicable protection activities in the sanctuary.

#### **Objectives:-**

1. To raise awareness about protection issues.
2. To develop infrastructure for the protection of sanctuary area.
3. To organize different kind of anti-poaching activities and anti-grazing in the sanctuary area.
4. To provide protection to the entire eco-system of the sanctuary.



### **Management Prescriptions:-**

For the better management of sanctuary, the protection activities can be categorized in to following activities:

1. Group Patrolling.
2. Combing Operation.
3. Night raids.
4. Infra-Structure facility.
5. Survey, Demarcation and Reinforcement of Existing Boundary Pillars.

**1. Group Patrolling:-** Group patrolling system for the better management and protection of flora and fauna needs to be strengthened. This system is very effective if applied in the field in letter and spirit. In this system, a group of persons posted in the sanctuary along with potters and cook does the patrolling of the sanctuary area (Plate:7). During this process the team headed by Range officer, Block officer or sometimes by ACF/ DFO scans the area, forest, beat and block wise. The more sensitive areas are frequently visited by the team. A format has been prepared in this regard, which covers most of the aspect related to wild life management. Different routes and tracks are covered by the team. All the activities given in the format are recorded during the patrolling and these formats are compiled at the division level. These are also helpful for the preparation of APO of the sanctuary. The teams are being provided with some basic facility like food and stay arrangements like tents, sleeping bags etc. For this purpose funds has to be proposed every year in the APOs. ( Format Performa)

**2. Combing Operation: -** This operation is useful in the field to search the traps / snares etc. In this operation special routes which are more sensitive and suspected to poaching activities will be scanned. The tracks which are frequently used by wild animals and feeding grounds of the pheasants will be scanned properly. This exercise will be repeated three- four times in the sanctuary depending upon the requirement. For this purpose funds has to be proposed in the APOs every year, which are required for the payment of food, cooks and porters etc.

**2. Night Raids: -** Special raids during early morning and late night will be conducted in and around the sanctuary. This exercise will be more frequent during snow fall time and

immediately after the snowfall. In this operation one Bolero camper vehicle along with 6-8 staff will conduct the raids in and around the sanctuary area. Special drives will be carried out to check the vehicles from remote area along with their bags and belongings. Such type of operations will be very helpful to check the illegal transportation of timber and wildlife articles. For this purpose vehicle facility should be allowed to the staff because the department is already facing the shortage of such type of vehicles at Range level. For this purpose funds has to be proposed in the APOs every year.

### **3. Infra-Structure Facilities:-**

To achieve the above proposed activities, it is very important that field staff should be well equipped and necessary facilities should be provided to them. Infrastructure facilities which are required for this purpose includes –

- i. Construction of Watch towers at Barog and Gulamlang,
- ii. Complete camping equipments (as per details given below )
- iii. Arms and ammunitions (as per details given below )
- iv. Equipments like digital cameras, video cameras, binoculars, night vision binocular and camera traps etc. are urgently required (as per details given below )

### **LIST OF TOTAL INSTRUMENTS AND LOGISTICS AVAILABLE AND REQUIRED**

Existing Scenario	Proposed/Recommended action
<b>1. Vehicles for forest staff</b>	
1) One Gypsy -DFO 2) One Bike at Manali for Forest Guards	1) One Mahindra Bolero Camper/Multipurpose vehicle –for Range Forest Officer at Manali 2) One bikes for forest guard for patrolling/ rescue operations. 3) One Patrolling/ Rescue Vehicle needs to be purchased for Rapid Response Team/ force at Kullu.

<b>2. Instruments, gadgets and Camping Equipments (At Wildlife Range Office, Manali for use in Manali and Kais WLS)</b>	
1) Only one desktop + 1 Scanner cum Printer +1 printer in Range office, Manali 2) 9 GPS 3) 8 Binoculars 4) 1 DSLR camera 5) 9 Camera Traps 6) 1 Night Vision Binocular (At Kullu with Quick response Team) 7) 5 Four Men Tent 8) 10 Two Men Tent 9) 23 Cary Mat Big & Small 10) 14 Sleeping Bag 11) 8 Rucksacks 12) 8 Rain Coat Ponchu 13) 5 Search Light (Only 2 in working order) 14) 10 Solar LED Lamp	1) One Desktop computer/ Laptop is required for Information Centre at Manali. 2) Two Digital Cameras for beat level forest staffs 3) One Video Camera 4) 10 No. Trap Cameras required for Kais WLS 5) 1 No. Flying Surveillance Camera for rescue, surveillance etc. of Manali WLS. 6) 2 No. Big Search Light/ Torch 7) 1 No. Night Vision Binocular 8) 5 No. Two Men Tent 9) 10 No. Cary Mat Small 10) 5 No. Sleeping Bag 11) 5 No. Rucksacks 12) 5 No. Rain Coat Ponchu 13) 5 No. Emergency lights/ power banks
<b>3. Arms and ammunition</b>	
<b>Rescue cages</b> ( Bird Crates, Reptile Crates, Monkey Cages, Squeez Cages, Small and Big Animal trap cages, Mobilization cage of Leopard, Bait Cage, Sambar transportation cage- 1 No. of each) and one <b>tranquilizer gun is available at Kullu Wildlife Range HQ with Rapid Response Team.</b>	1) Total five Rifle .315 required. One at the range office, two for each Beat officer two spare for emergencies 2) 2 No. Shot guns 12 bore 3) 1 No. pistol 4) 1 No. Stun Gun (Electric Shock) for animal rescue. 5) 1 No. Net Gun 6) 1 No. Smoke Signal Gun

## **5. Survey, Demarcation and Reinforcement of Existing Boundary Pillars**

Most of the boundary pillars in the sanctuary area are damaged despite of their maintenance. To maintain the area free from all illegal activities, it is important to reinforce all the 9 large boundary pillars and other 22 small boundary pillars with cement concrete. Under this scheme the all large and small boundary pillars will be marked with

GPS coordinates and then reinforced with cement concrete during the coming financial years. For this purpose funds has been proposed in the APOs of this management plan.

### **6.3.2 Habitat Management:**

Habitat management is one of the most important activities of wildlife management. More ideal the habitat is, better it is in terms of availability of food, cover and water to wild animals. It is imperative to analyze the resources that are available in the habitat as this is the main factor which ultimately controls the wild life. Type of habitats available in the sanctuary needs to be thoroughly studied as on this will depend the future management and all management practices shall be guided by the type of habitat and available resources.

#### **Objectives:-**

1. To study the habitat with respect to availability of resources and constraints.
3. To assess the suitability of habitat for various kind of wildlife.
4. To carryout various activities for habitat enrichment with minimum disturbance.
5. To propagate the local species of fruit bearing plant to ensure of availability of food to the wildlife of the area.

#### **Management Prescriptions:-**

For better management of the habitat of sanctuary, following activities needs to be carried out.

1. Raising of Fruit Bearing Trees.
2. Improvement of Pastures.
3. Maintenance of water sources.
4. Augmentation of Salt Licks.
5. Protection and maintenance of Physical Features.
6. Nursery maintenance

#### **1. Raising of Fruit Bearing Trees:**

The seeds of wild fruit bearing plants like Akhrot, Kahnor, Paja, Wild Cherry etc. are being collected and raised in the nursery. Some are being propagated through cuttings

in the nursery. This needs to be supplemented during the plan period. Every year 15 to 20 thousand plants of such species will be raised in the nursery. About five hectare of area will be planted every year. Propagation of hill bamboo (Nirgal) will also be done in the sanctuary. The cost will be applicable as per departmental norms and schedule.

## **2. Improvement of Pastures:**

Under pasture improvement not only the quality of grasses is to be improved but in vast extensive thaches/ pastures, planting of bushes like Berberis, Cotoneaster, Arundinaria and other species needs to be carried out. This along with increasing variety of forage shall also provide shelter to wild life. The local nutritious grasses needs to be encouraged. Every year 10 hectare of area should be tackled under this scheme.

## **3. Maintenance of water sources:**

The areas with steep slopes in the WLS are deficient in water. To improve the water availability in the sanctuary, it is necessary to construct some water harvesting structures. These structures should be spread over the entire area. Every year five-six earthen water ponds will be constructed in the sanctuary. The site of proposed water ponds should be identified carefully after visiting/inspecting the area by DFO/ACF with clear objectives. The design will be according to the site available on the spot. The cost of each structure will be as per the estimate and shall vary from site to site.

## **4. Augmentation of Salt Licks:**

The wild animals mostly ungulates living in the forest area are always devoid of mineral salts. To fulfill this deficiency they search the place where natural salts oozes out from the rocks. These mineral salts are licked by them. Provision of artificial salt lick affect the behaviour and movement of wild animal and sometimes it also help poachers to locate the presence of the animals. Therefore, it is necessary to provide due care and protection where artificial salt licks have been provided. It is suggested that all the existing artificial salt lick locations should be mapped and based on the information decision to provide new salt licks should be taken carefully. These salt lick sites should be identified carefully after visiting/inspecting the area by DFO/ACF. During the group patrolling exercises such sites have been identified and which needs to be augmented and supplemented by providing blocks of rock salts in these places. Monolith salt blocks may also be used for this purpose which contains mixture of many mineral salts.

## **5. Protection and maintenance of Physical Features:**

All the physical features like caves, dens, cliffs; dead and dry trees would be protected and kept as such, as these features are used by wild animals. Dead and dry trees are used by many birds, insects and small mammals as resting, nesting, roosting and perching purpose.

## **6. Nursery maintenance:**

The only nursery available in the sanctuary at Van Vihar, Manali (Annexure- XIII) which needs annual maintenance, and shall cater to the needs is of various kind of plants required for various activities of habitat enrichment inside the sanctuary. The plants to be raised should invariably include the wild fruit plants and tufts of local grasses. At least fifty thousand rupees will be required for its annual maintenance.

### **6.3.3 Watershed Management**

The sanctuary forms the catchment of mainly Manalsu nalla which is the small tributary of Beas River. In addition to this there are many small streams passing through the sanctuary. Hence it is very important to manage the sanctuary through watershed approach to ensure the holistic development of the sanctuary. Through various soil and moisture conservation works apart from plantations, we will be able to reduce the siltation of Beas River as well as control the soil erosion.

#### **Objectives:-**

1. To reduce the soil erosion and the silt load.
2. To improve the availability of water in water deficient area.
3. To improve the overall habitat of wild animals.

#### **Management Prescriptions:-**

Following activities are proposed under watershed management.

1. Construction and de-siltation of water ponds.
2. Soil conservation works
3. Bio-Engineering Measures

### **1. Construction and de-siltation of water ponds:**

As discussed earlier that the southern part of the sanctuary is drier than other areas, hence it is necessary to construct more earthen water ponds in this area as compared to the other to harvest rain water and snow. There are some natural ponds inside the sanctuary which needs de-siltation. Such activities will be helpful for recharging and retention of moisture regime of the sanctuary. Also these water ponds will serve as water source for the wild animal. For the construction of one earthen pond an amount of rupees twenty to thirty thousand will be required.

### **4. Soil conservation works**

The area of sanctuary along the Manalsu nalla and surrounding is quite steep and to check the water flow in nallas, check dams / check walls etc. needs to be constructed (Annexure- X). This shall help to reduce the soil erosion by controlling the speed of gushing waters which keep on cutting the nalla banks. At places along the roadside there are many slips which need immediate attention and action. The cost for the construction of these structures will be applicable as per departmental norms and schedule.

### **3. Bio-Engineering Measures:**

The affected area all along the roadside and inside the sanctuary will also be treated through bio-engineering measures. Besides check walls and check dams, local fruit bearing bushes and shrubs will be raised all along the slips which shall help to stabilize such slips. The cost will be applicable as per departmental norms and schedule.

### **6.3.4 Human wildlife Conflict**

Man - animal conflict is not a very serious problem in this sanctuary. Not even a single case of damage to human life has been received during last two- three years. Crop damage is also negligible. Although there are habitations on the periphery of this sanctuary, but the report in this regard is almost nil.

### **Prescriptions:**

1. Awareness programme/ workshops should be organized for local people to make them aware about dos and don'ts in case of encounter with wild animals.

2. The local people should be made aware about various departmental welfare programmes, especially about the procedure to file compensation claim.
3. A rapid response team consisting of trained officials along with equipments should be stationed either at Range or Division HQs to deal with any exigencies.
4. Fodder tree plantations shall be developed on the periphery of the villages and stall feeding may be promoted.

### **6.3.5 Fire Management**

The protection from forest fire is one of the most difficult tasks for the protected area managers. In Manali Wildlife Sanctuary, the winter fires are more common than summer fires because the *phat* burning practice during winter is common. Whenever the winter rains are delayed, local people use to burn the debris in their fields and adjoining areas. Fire has also been used as a management tool to encourage the growth of grass for grazing. In spite of strict vigil, sometimes fire incidences occur in the sanctuary areas and cause loss of forest and wildlife.

#### **Impact of Fire:**

Fire is the biggest threat that destroys the habitat besides making the micro climate very hot, dry and uninhabitable to the wild. Fire protection measures are required to be taken and co-operation from local people may be sought to avoid incidences of fire in the protected area. The impact of fire depends on its extent and gravity. The incidences of fires affect several micro flora and fauna and destroy several herbal species. It also causes exposure of soil and degrades the valuable habitat and decreases the biodiversity of the area. It also accelerates the soil erosion and silting of reservoir apart from accumulation of large amount of debris in the nallas and streams.

#### **Management Prescriptions:-**

Following activities are proposed under Fire Management.

1. Maintenance of fire lines.
2. Engagement of Fire watchers.
3. Awareness Programmes.
4. Deterrent Action against the miscreants.
5. Incentives to villagers.



### **1. Maintenance of fire lines.**

Creation and maintenance of fire lines is one of the primary activities for control of forest fires. There are three fire lines (Annexure – XVI) and many perennial nallas and natural springs in the PA which protects the PA from fire. Maintenance of these fire lines and paths is required. A publicity and awareness programme in respect of fire fighting and prevention of forest fire has to be planned and executed. The protected area although is not very fire sensitive but a constant vigil is required to control any fire incidence. Besides these fire lines, the contour paths and bridle paths passing through the sanctuary also acts as fire lines which also needs annual maintenance.

### **2. Engagement of Fire watchers:**

Fire prone areas have been identified and fire-watchers needs to be engaged during the fire seasons. During fire season, the fire watchers are being engaged to control the forest fire. Local people around the periphery of sanctuary are engaged for the purpose. These fire watchers keep strict vigil on such incidences. In case of major fire incidences, the local villagers are also involved for fire fighting. Prior to suspension of forest rights like T.D, the local villagers were being called for extinguishing of fire. The forest guard was supposed to mark the attendance of all the right holders during the operation. After the suspension of rights, the response of the local villagers towards fire control is very poor. Funds for engagement of fire watchers have been proposed during the plan period.

### **3. Deterrent Action against the miscreants:**

As indirect measure, the cases of deliberate forest fires should be detected and the culprits should be apprehended and prosecuted. Although, all the major forest fire are reported to the police but the culprits remains untraced most of the time. Sincere efforts in this direction are needed.

### **4. Awareness Programs:**

Awareness programs and workshops among the villagers, school children and other institutions around the sanctuary would be conducted every year. More emphasis will be given to highlight adverse impacts of forest fires on the flora and fauna. Pamphlets and brochures will be published and will be distributed among the peripheral villagers and visitors.

## **5. Incentives to villagers:**

Special incentives should be given to the villagers who come forward for fire fighting. The villages and their surrounding areas which remain free from the fires should also be given some reward or incentive. An amount of rupees five thousand per village should be given every year to those villagers whose surrounding remains free from forest fires.

### **6.3.6 Wild Life Health Care**

For the better management of wild life Sanctuaries, it is important that the health status of all the animals inside the sanctuary as well as on the periphery of the sanctuary should be sound. The health of the animals in and around the sanctuary should be monitored properly, because local people as well as migratory grazier visit the peripheral areas of the sanctuary. There is every possibility of transmission of diseases from domestic cattle to wild life and vice-versa. In such condition, it will be difficult to control the communicable diseases. To overcome such diseases /problems it is very important to take preventive measures. The main strategies for this purpose are as follows:

#### **1. Vaccination of adjoining livestock.**

The whole sanctuary area is surrounded by habitations. The main occupation of the local people is agriculture along with animal husbandry. Every household rears sheep, goats, cattle and horses. Most of the cattle belong to local breed. Stall feeding is done only in case of jersey breed of cows. All other cattle depend on open grazing in the forest area. The condition of the cow sheds is also very unhygienic. There is every possibility of spreading of communicable diseases in such condition. Therefore it is very important to do vaccination of all the domestic cattle around the sanctuary area with the help of veterinary department and local Panchayats. Special budget should be provided for this purpose so that all the domestic cattle should be vaccinated timely. The village wise cattle population is available with the department. This shall be done with the help of veterinary department.

#### **2. Rescue and First aid center**

A small off display facility needs to be created where rescued wild animals will be kept for treatment. These animals will be kept under optimum conditions of food, shelter,

space and health care for a couple of days. They will be given the required health treatment and will be released into the wild soon after the treatment or they will be sent to other Zoos/ rescue centre of the state.

### **3. Disease surveillance:**

Early detection of disease, quick disease reporting system and instigation of a rapid response to reduce the likelihood of establishment of diseases and preventing their spread to neighboring areas can only be achieved by proper active and passive surveillance system.

Active surveillance involves targeted monitoring of a species for potential incursion of diseases. The list of diseases with potential to impact the population and biodiversity within the park, human and livestock population and economy outside the park should be established.

Passive surveillance involves opportunistic monitoring of wild species by field personnel for any mortality or morbidity event. The flow of communication between field personnel and stakeholders will determine the efficiency of the disease reporting system and the effectiveness of implementation of strategies for control and prophylactic measures.

It is suggested that during patrolling field staff will note down the condition of wild animals in case of direct sightings. Tourists may also be encouraged to report any unusual condition of wild animals. In case of any information about any diseased wild animals or any unusual behavior by animals, field sample will be collected with the help of veterinarian for further investigation.

### **4. Public Awareness:**

To prevent wild animals from frequenting into human habituated areas, the communities living around the WLS should be made aware of the repercussion of irresponsible disposal of garbage and livestock carcasses.

### **5. Education and training:**

All the stakeholders require education and training for at least basic public health concerns and bio-security to achieve the desired outcome. Protocols for handling carcasses, attending disease outbreaks, etc. should be made. The field personnel should be made aware of this and given at least basic training for this purpose.

## **CHAPTER – 7**

### **ECOTOURISM, INTERPRETATION AND CONSERVATION EDUCATION**

#### **7.1 General**

Tourism in wildlife sanctuaries plays an important role in creating awareness among the masses. Manali sanctuary is situated adjacent to Manali town, a famous tourist resort. This sanctuary can play an important role in raising interest towards wildlife conservation. Around 300 trekkers visit the sanctuary every year. To meet the requirement of the visiting tourists, existing facilities shall have to be improved.

The wildlife sanctuary provides a very good opportunity to the wild life enthusiasts to experience the wilderness of the area. The trekkers visit for a short period in the months of May and June to ascend right through the sanctuary and then few move towards Bara Bhangal of Kangra District. The forested landscapes, snow clad mountain peaks and towering trees inhabited by birds and animals all make it an ideal and potentially vibrant eco-tourism location.

For the information, education and awareness of people and tourists, an Information centre has been established at Manali which is being looked after by Bio-Diversity Conservation Society. This centre has facilities like conference hall, audio-video display, posters and LED Photoframes, photos displaying the flora and fauna in and around the Sanctuary.

#### **7.2 Objectives**

The main objectives are to create awareness among the masses, to make them realize the importance of wildlife conservation, environment education and also to fetch some revenue to the government. To promote eco-tourism with an objective, the entry of visitors in the sanctuary will be regulated. Though some individuals have been earning their livelihood out of eco-tourism activities yet efforts will be made to involve more rural youths in it.

#### **7.3 Problems:**

Major problem in promoting tourism in Manali sanctuary is lack of proper facility to the tourists such as poor communication, stay arrangements, bridle paths and proper information. The tourists throng Manali area during summers but it is a pity that only few

endeavor to visit the sanctuary. This probably is due to lack of publicity or enthusiasm. The publicity part is proposed to be looked after well during this plan period, if required, the staff will be trained to make them conversant with the requirements of the tourism activity and to guide and look after the tourists.

## **7.4 Strategies**

### **7.4.1 Identification of Zone**

The tourism zone will be the peripheral zone along the Eastern Boundary of the sanctuary and nearest to Manali town. The zone will be 150m on either side of the bridle paths at other places. The trek to Bara Bhangal in Kangra district is not used by many and hence cannot be stated to fall under this category. It will depend upon increase in its use in future.

### **7.4.2 Infrastructure Development**

With a view to provide infrastructure to the visitors, some activities have been included in the plan. Providing camping grounds, bio-diversity trails and repair of existing paths have been included. Some similar activities proposed under the infrastructure development too will support needs from eco-tourism point of view and vice versa. Pl mention here the details of activities – name of camping ground areas identified, details of biodiversity trails etc.

### **7.4.3 Regulations, Monitoring and Evaluation**

The entry of tourists will be regulated as per rules in force. The wildlife warden may specify a closed period in view of breeding season and fire season. The visitors are to be informed and restrained from disturbing and damaging habitats in the sanctuary. Mechanism for long term monitoring and evaluation has to be developed. More details are required

## **CHAPTER – 8**

### **ECO-DEVELOPMENT**

#### **8.1 Objectives**

The goal of the plan is to minimize the use of protected area resources and to make them sustainable in such a way that people and the sanctuary can co-exist in perpetuity.

Following are the objectives of the plan:

1. To reduce fuel wood consumption.
2. To reduce grazing pressure.
3. To regulate and reduce medicinal herbs collection.
4. To reduce use of timber in house construction.
5. To promote eco-tourism
6. To improve the socio – economic status by providing the livelihood means at their doorstep.
7. To promote the traditional and indigenous methodology in implementing the plans.  
Also, promote their culture.
8. To involve people for understanding the protected area values and conservation needs.

These objectives can be achieved by constituting the Eco – Development committees at village level and framing the micro-plans after conducting the Participatory Rural Appraisal (PRA) exercises with the villagers. These committees will be the registered bodies under Society Registration Act. H.P. Forest Department should act as facilitator cum motivator in framing their micro- plans.

#### **8.2 Specific Issue**

Since, the introduction of the LPG, considerable decrease in demand for fuel wood has been noticed in whole of the valley. Pressure on account of grazing, timber, grasses and minor forest produces (NWP) have continued to remain as the threats for the conservation. The exercise of rights has been suspended in one go from March, 2004 onwards in the protected areas. This has increased the problems of the staff posted in the sanctuary. The villagers having rights over the forests inside the protected area have not

taken in a positive manner. They exert pressure on the field staff, who are at the receiving end. The people living in the periphery of the sanctuary have to be kept in confidence and consulted regularly. The present focus will be to educate people on the rationale behind the above objectives, their role and involvement to achieve the objectives. Awareness at various levels shall have to be organized regularly so as to achieve the above mentioned objectives.

### **8.3 Broad Strategies**

The strategy to achieve the above mentioned objectives is to gain the support of the local people. In the present scenario, when rights are not being exercised, the support to the Forest Department from the community is very poor. The positive impact of tourism and horticulture has definitely mitigated the demand of the local people for exercise of their rights and people have adopted improved livestock management, use of alternate fuel and also reduced use of timber. But in long term awareness and wild life tourism in protected areas has to be made the main mantras to achieve participation of communities and thereby gaining the confidence of the local people for the conservation programme.

### **8.4 Village level Site Specific Strategies**

At village level more concentrated and specific effort are needed. An effective inter-sectoral coordination mechanism is to be developed and implemented to ensure that all relevant Government and institutional stakeholders are working together to conserve and sustainably manage the sanctuary. The sanctuary boundaries be checked and demarcated and enforced with community support. Permanent structures be erected along the road to check the encroachments.

### **8.5 Monitoring and Evaluation**

Monitoring and evaluation mechanism of eco-development programmes should be undertaken periodically on participatory basis associating the local communities. Role of Panchayats is important in conservation and implementation of eco- development schemes and its monitoring and evaluation. Local organizations like Mahila Mandals and Yuvak Mandals be involved in monitoring and evaluation of ongoing programmes. To evaluate the progress of eco-development programmes, committees have to be constituted in each ward of the Panchayat.

## **CHAPTER – 9**

### **RESEARCH, MONITORING AND TRAINING**

#### **9.1 Research and Monitoring:**

So far, not much wildlife related scientific studies have been undertaken in the Protected Area. Ecological and wildlife studies are essential for the sound and scientific management. Therefore, research projects to study ecology, animal migration, predation, territory, carrying capacity, food chain, animal plant association, animal behavior, effect of climate change on fauna and flora, food habits, mating and breeding behavior of individual species have to be designed and studies shall be undertaken. Other subjects for the research can be:

1. Study of invertebrates, their habitat and distribution.
2. Impact of increasing tourism on habitat of specific wild fauna
3. Effect of habitat improvement activities.
4. Assessment of growing stock in the forests of protected area.

The research work can be entrusted to the various research establishments like Wildlife Institute of India, GB Pant Institute for Himalayan Environment and Development, Himalayan Forest Research Institute, Dr. Y.S. Parmar University of Horticulture and Forestry or any other organization that is capable and interested to take up research in wildlife. It is expected that the results of the research work shall be available for the better scientific management of the Manali Sanctuary during the writing of the next management plan.

**9.2 Monitoring:** Monitoring proposed in Manali is Wildlife Sanctuary is as under:

#### **9.2.1 Monitoring wildlife populations**

Camera traps may be placed on few strategic points to monitor the activities wild animals especially Musk deer, Black Bear and Leopard. Finally on the basis of movement areas obtained, distribution maps for various species would be prepared separately. At present population estimation of pheasants are being done only and population estimates of other birds are not carried out in the reserve at present. Hence it is suggested that estimates of birds may also be done.



### **9.2.2 Monitoring of vegetation**

Change in vegetation cause change in fauna and its distribution. Since the Manali WLS is very rich in plant diversity especially alpine areas the importance of monitoring does not require further elaboration.

Permanent vegetation monitoring plots may be marked on the ground and data may be collected regularly. Various aspects may be monitored by staff like:

- Invasion of weeds
- Erosion of soil at certain sites due to regular burning of grasslands
- Change in grass and other species composition due to r burning of grasslands

### **9.2.3 Monitoring of Physical changes**

All the changes developing in physical structures would be monitored, so that their management can be done timely and appropriately.

### **9.2.4 Monitoring of wildlife health**

Wildlife health monitoring is one of the important aspects which govern management strategies. Monitoring of following aspects may be done:

- Identification and monitoring of diseases in domestic cattle in surround of Manali Wildlife Sanctuary.
- Identification and monitoring of diseases in wild animals and plants.
- Monitoring of relevant samples from carcasses

### **9.2.5 Monitoring of Tourism**

The questionnaire may be made and got filled by the visitors. Feedback register may be kept at Information center, Manali.

### **9.2.6 Monitoring of weather changes**

Collection of data will be done from the weather recording stations of Mountaineering Institute, Manali. Small weather recording facilities may be created at

Information center, Manali to record rainfall, temperature etc. The data will be analyzed to find out the trends and formulate the strategies accordingly.

### **9.2.7 Photography as a monitoring tool**

One digital still camera and one video camera would be purchased to collect evidences and monitor changes. Photographs at various seasons and for various sites would be clicked on same day and from same position every year. This would work as a cheap and great tool to monitor what seasonal and yearly changes are happening in habitat so as to do appropriate management interventions. Certain photograph shooting point should be permanently marked and position be recorded in beat book / manual.

**9.2.8 Satellite data monitoring:** Details for monitoring change in vegetation may be downloaded free of cost from [www.glc.f.umd.edu](http://www.glc.f.umd.edu)

<http://glcf.umd.edu/data/>

It gives Landsat data. It is free downloadable i.e. there is no need to pay for the images.

Process:

- 1 .Go to the site and explore.
2. Select Data and Product
3. Select Landsat satellite.
4. Select Map Search
5. Put Latt and long in the given format.
6. Press update map.
7. Press Preview and Download. See the preview and press download to download the image. It will give the image in ZIP folder so we have to unzip it. All seven bands of Landsat are available on it but we should open and download one by one. Landsat image is given in UTM, LCC and polyconic whereas in IRS it is given as XY (Five points are given starting from center of square)

### **9.2.9 Long Term Ecological Monitoring (LTEM)**

Gathering of periodical 'blind' or 'total' data on each and every species or element of habitat those are occurring on a fixed, permanent transact, plot, etc., subsequent data analysis and infer what has happened to species richness, diversity, productivity, succession, etc., and based on the preliminary knowledge of the study area, selected taxa are identified as "indicator" or "vital signs". The research work has to be outsourced by engaging a professional agency.

#### **Methodology:**

- Consider the entry points in the WLS. The trail/path starting from the boundary/road head and going into the WLS need to be selected in the manner that it reaches the areas of ecological significance, i.e. where most of the biological diversity is located. Such trail/paths either follow the valley-bottom or lead to the hilltops covering various altitudinal gradients. Thus walking along a path/trail can give idea about the vegetation, and animals across the altitudinal variations. This path/trail (transect line) also covers the habitation areas to study PA-local communities interactions, impacts of PA management actions as well as the impacts of village eco-development programmes.
- The LTEM (or experimental) plots can be laid all along the considered transect line (the path/trail). From a statistical point of view, it is better to use many small plots than a few large ones. The plots and transects need to be placed randomly with respect to the area being sampled. In this regard, regular dispersion of plots on a pre-existing transect line is easier and simpler to arrange and is also valid as long as the arrangement of the transect line bears no relation to regularities in the habitat.

#### **Recommended Action**

- Dissemination of the knowledge of LTEM among the staff and community members residing close to PA.
- Prioritization of the paths/transect lines for LTEM work.

- Marking of one or many paths (transect line) that goes through most of the representative HOTSPOTS of biodiversity on the ground and on the map of the WLS for LTEM work.
- Use of LTEM for habitat monitoring.
- Marking the main path (transact line) at 250 meter intervals. Consider those points which are HOTSPOTS of biodiversity for the initial monitoring works.
- Mark about 30 to 50 such points (HOTSPOTS) for initial LTEM purposes.
- Fill up all the parameters as mentioned in the description above (General Information, Floral Information, Faunal Information, Human Interference, and Recommendations) at each HOTSPOT (LTEM point).
- Store information for each HOTSPOT (LTEM point) in a register or feed in a computer as baseline.
- Consider LTEM an important part of management plan of PA. This in turn will lead to management interventions such as enhanced protection, other relevant actions.
- Give an important role to the local community in LTEM.
- Use LTEM for threat assessment of floral/fauna] elements of a PA.
- Use LTEM for monitoring impact of tourism.

An example of laying LTEM or experimental sample plots along a transect line in Manali WLS can be considered: the path or transect line starting from Manali WLS entry Gate (2100 m) in Monalgahar beat and leading upto the Lambadug, Dohrni can be named as M1. It is suggested that the first experimental plot can be considered at Gate followed by second plot after 250m, then the third plot after next 250m and so on. Thus there will be four experimental plots in each km. Each point after every 250m can be marked on a tree or rock or any other easily recognized object. Each of these points can be numbered as M1/1, M1/2, M1/3... and so on suggesting that Mi is the number of a particular transect line (path) and denominator is number of the particular experimental plot. Similarly, Bungdwari beat will have numbers like T1/1, T1/2.

- Devise A Performa to record observations at the experimental plots has already been devised. For each experimental plot, this **Performa** have following parameters:
  - i. Circular plots of 12.65m radius: trees including timber and fodder species, their regeneration, signs of human pressure and wild life use, structure and species composition, (area of a circular plot: 498.9 or about 500 square meters)
  - ii. Nested plots of 5.65m radius: all the shrubs and saplings, their cover, height, browsing signs and other uses, (area: 98.5 or 100 sq. meters).
  - iii. Four square plots of 1m x 1m within each circular plot at NWSE directions: to record cover of herbs and grasses, presence of medicinal plants, mushrooms etc.

**The Performa have following information for each experimental plot**

**General Information:**

1. Experimental Plot No.
2. Date of Observation
3. Locality
4. Latitude and Longitude
5. Altitude (m)
6. Aspect
7. Slope (degree)
8. Terrain
9. Rock/ Soil
10. Snow cover

**Floral Information:**

1. Tree cover
2. Trees
3. Canopy
4. Shrub cover
5. Herb cover
6. Grass cover
7. Medicinal plants

8. Weeds
9. Mountain bamboo

**Faunal Information:**

1. Mammals (signs or sightings)
2. Birds (signs or sightings)
3. Insects
4. Reptiles
5. Amphibians
6. Fishes

**Human Interference:**

1. Signs of grazing
2. Signs of grass collection
3. Signs of lopping
4. Signs of wood collection
5. Signs of bamboo collection
6. Cultivation
7. Habitation

**Important Recommended Actions**

As indicated above, the Performa filled-up at an experimental plot will give lot of information regarding biodiversity of the area as well as human interference. Based on the information collected, select such LTEM or experimental plots which have large number of biodiversity values (HOT SPOTS) or some other specific characteristics. Such experimental plots can be used for conducting research work for several studies based on faunal, floral and aspects of WLS-human interactions.

**Usefulness of Experimental Plots**

The experimental plots can be used for conducting research work for several studies based on faunal, floral, and aspects of PA-human interactions. The data recorded on the Performa as mentioned above can be easily entered into a computer using Foxbase or

FoxPro software. However, it can also be suggested that a performa filled-up at one or several experimental plots on a particular date can be kept in a file. Repeat observations for the same experimental plots can be inserted in this file by the observer. Over the years, this data will help in showing trends in change of biodiversity of the area. It is suggested that one file should be made for one transect line (path). This will help in updating as well as retrieval of data.

The observations made through different studies at these plots can be used to draw together information from disparate studies to interpret common patterns of occurrence. Such LTEM plots will also allow best possible use of incidental discoveries and opportunities for inter-study comparisons and synergies.

### **Role of Community:**

The community members and frontline staff of a PA will find this method quite easy to follow. The local villagers/forest guards usually know the local names of plants and animals. Therefore, it is suggested that the WLS staff can collaborate with the local community. They can fill-up the Performa using local names which ultimately can easily be translated/converted into the Latin names. The most important aspect of the above mentioned methodology is that it is community/ front staff-friendly, easy to understand and follow in the field. Such a methodology can be standardized in the field for monitoring/research work through a well-coordinated effort.

**Regular monitoring** - During Group patrolling various data (Order No. 73/2018 dated 05.02.2018) shall be collected.

### **Wildlife Surveys and Abundance Estimation:**

One of the important indicators of the success of management practices is the abundance of animals (pheasants, large mammals). The Wildlife Institute of India has started ungulate estimation of the PA. The inventories of mammals, birds, reptiles, amphibians, annelids, molluscs and insects (mostly butterflies and moths) have been prepared as per old management plan, hence needs revision. The vegetation of the PA has to be studied and documented.

**Recommended Actions:**

- Proper field trainings for the Forest Guards, Forest Workers and wildlife watchers for the next/second level of information collection on evidence of the animal's presence, such as tracks, droppings, calls, nests, feeding signs, etc.
- The advanced or third level of information collection is by determining the trends or indices of population growth and the actual population numbers
- Relative abundance estimates based on evidences can be undertaken by the trained field staff. In PA, this is very practicable for the Ghoral droppings, musk deer latrine sites, Brown/Black Bear dung and diggings, leopard scats, pheasant droppings, feathers and nesting sites, and porcupine quills.
- Population estimation based on vocalization is recommended for the pheasant surveys and census (please see the Appendix ).Based on the mean group size, obtained from direct observations of the 6 to 10 groups, and the number of groups counted from vocalization, the approximate population in the area could be estimated.
- Point Sampling or Two Step Method for ground cover is recommended for the measuring the ground or basal cover of vegetation at the ground level.

**9.2.10 Management Effectiveness Evaluation (MEE) –**

Management Effectiveness Evaluation (MEE) is an useful tool to assess the effectiveness of management initiatives and to understand better what is working and what is not, and to plan any necessary changes as efficiently as possible. MEE has become an increasingly common component of protected area management worldwide.

WCPA framework for assessing management effectiveness – The WCPA framework consider management as a process or cycle with six distinct stages or elements:

- It begins with establishing the context of existing values and threats
- Progresses through planning
- Allocation of resources (inputs)
- As a result of management actions (process)
- Eventually produces goods and services (outputs)
- That result in impact or outcomes.



Of these elements, the outcomes most clearly indicate whether the PA is maintaining its core values, but outcomes can also be the most difficult element to measure accurately. However, the other elements of the framework are also important for helping to identify particular areas where management might need to be adapted or improved.



During 2017-18, Wildlife Institute of India conducted Management Effectiveness Evaluation of Kais WLS. On similar pattern self-assessment for Manali WLS can be done every year. In this regard PCCF (wildlife)- cum- CWLW (HP) directed all PA managers to do self-assessment every year on the same pattern as for MEE. After comparing MEE report with previous report, actionable points may be suggested for implementation.

## **9.3 Training**

### **9.3.1 On the Job Training**

Technical capacity building for sustainable management and conservation of the protected area shall be done through the training programmes. On job trainings are to be given in the field during tours and workshops. In addition to above, the services of different institution and experienced persons in the State Forest Department can be utilized for the on job training programmes.

### **9.3.2 Formal Training Courses**

Training of the staff posted in the protected area is urgently required. Short term courses, special workshops and seminars can be conducted to refresh and enhance the knowledge of the staff. These workshops and courses will pave the path for learning from each other and sharing knowledge gained through field experiences. In hills, all the regions are not accessible to the human and such areas are safer habitats for the fauna. The staff may be trained in using new relevant methods to the hill regions so that the census methodology improves and more relevant results are obtained.

Specific web based or app based training -cum- guide modules needs to be developed and such apps will be very handy for the field staff in performance of their duty.

#### **A. Capacity building of the field staff**

The following are basic topics, which should be known by everyone in the field staff (Forest Guard, Block officer and RFO) in varying degree of details and understanding:

- The importance of nature conservation and Protected Area
- Use of GPS, Camera traps and other modern equipments
- A few terms relevant to biodiversity conservation
- Introduction and identification of local flora, vegetation/forest types
- Introduction and identification of local fauna (mammals, birds, reptiles, etc.)
- Elementary field methods for vegetation and animal population sampling
- Laws regarding forest and WL protection
- Effective dealing with human wildlife conflicts

- Protection measure, intelligence gathering and crime control
- Patrolling and Reporting
- Conducting Anti-poaching operations
- Law enforcement procedures
- Collection of evidence effectively for forensic examination
- Maintenance of equipment and other facilities
- Fires and control of Wildfires
- Map-reading
- First Aid and medical care
- Monitoring of the impact of villages and community on the PA
- Importance of local people in nature conservation
- Importance of linking conservation efforts to the livelihoods of the villagers
- Importance of local knowledge in biodiversity conservation
- Importance of nature based enterprise development as an alternative source of income generation for biodiversity conservation
- The Protected Areas of Himachal Pradesh
- Field Craft-how to survive in the forest

In addition, forests of Himachal Pradesh is backbone of the state's economy and one of the major industry in the state is tourism. It needs to be managed professionally and sustainably. In order to run eco-tourism business, staff need to be trained for-

1. Tourism management
2. Accounts management
3. Public relations
4. Logistics arrangement

There is need to create tailor made training programmes for staff in conformity with the level of education and hierarchy in administration. The training programme cannot be one time affair and it should be conducted regularly. The skill upgradation is required from time to time to adjust with fast changing scenario in PA management and forest resource management.

**B. Training for the local people/other stakeholders**

- Capacity building workshops for local villagers (alternative livelihoods)
- Orientation and vocational training of tourist guides.
- Multi lingual training for the guides including foreign languages
- Awareness /sensitization workshop for hotel/homestay owners , shop owners
- Special educative programs for school teacher and students
- Waste management training

**9.3.3 Establishment of a training Centre**

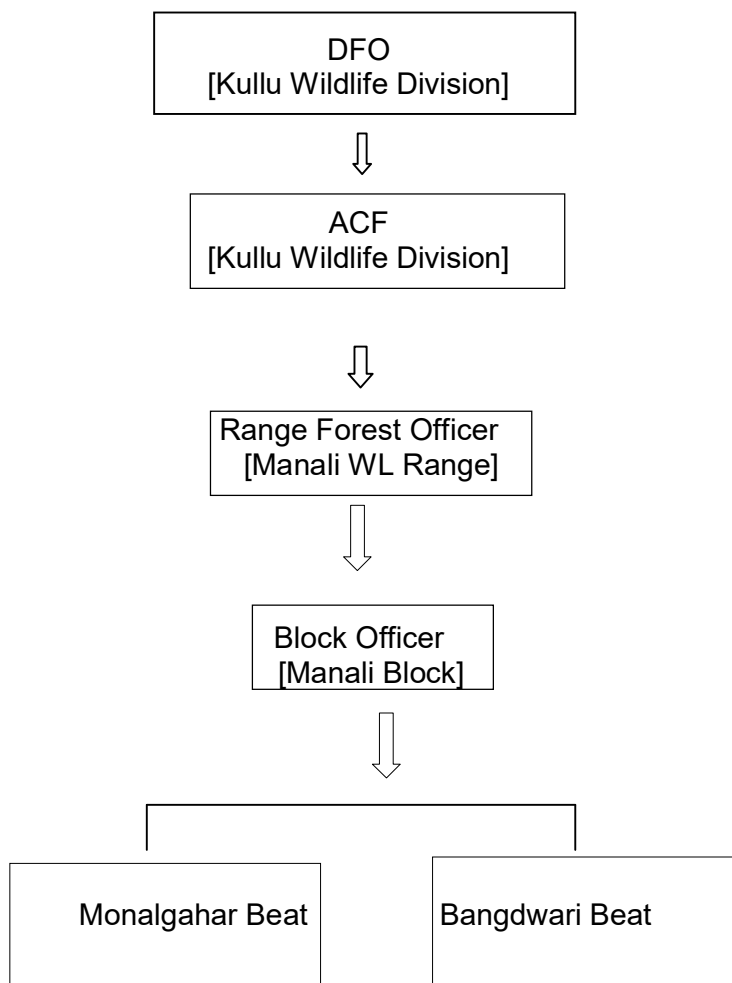
Regular and short term courses are conducted at training institutes situated at Sundernagar and Chail and therefore, there is no need to establish a separate training facility.

## CHAPTER – 10

### ORGANIZATION AND ADMINISTRATION

#### 10.1 Structure and responsibilities

For the development of any wildlife sanctuary, it is necessary to post trained wildlife staff keeping in view the provision of the staff for replacing leave reserve and staff deputed for training etc. In addition, only interested, dedicated, young and wildlife oriented staff should be posted for tenure of at least 3-5 year. At present, staff position working in the Manali Sanctuary is as under:-



S.N.	CATEGORY	STRENGTH		VACANCY
		SANCTIONED	IN POSITION	
1.	RANGE FOREST OFFICER	1	1	0
2.	DEPUTY RANGER	1	1	0
3.	FOREST GUARD	2	2	0

In addition to the regular staff, for various seasonal activities additional staff is hired as per the need and provision for which has been made in the proposed APOs. This additional staff is hired for following activities:

1. Hiring of staff for anti poaching activities.
2. Hiring of staff for anti grazing activities.
3. Hiring of staff for fire protection activities.

The terrain is tough and the road network is negligible. The bridle paths and patrolling paths constructed and maintained from time to time, although are the good but the patrolling is slow due to steep terrain. Inaccessible areas are tough to patrol alone and group patrolling is being done in the higher altitudinal ranges of the sanctuary for protection of the flora and fauna. Basic facilities like Camping equipment, light weight warm jackets, binoculars, camera, GPS are required for the effective protection and management of the sanctuary. Involvement of local people in protection and management of the area can also be an effective tool to manage the vast open treasure of the nature.

## **10.2 Staff Amenities**

### **A. Residential accommodation**

The office building and residential quarters for staff are adequate (List of buildings at (Annexure - VIII). No amenities are available to the staff inside the sanctuary. There are two patrolling huts in the sanctuary, one in each beat which are used by the staff during the patrolling of the area. Many a time staff is forced to take refuge in the caves or tents during the nights or bad weather.

**B. Special Pay**

The wildlife staffs are required to perform various activities (protection, plantation, soil and moisture conservation works and scientific monitoring) and subjected to threat from wild animals and poachers. They carry out the duty in harsh and worst weather condition. Hence, they deserve special pay like that of Police personnel.

**A. Uniform and field Equipment**

Proper uniforms and field equipment should be provided to the frontline staff regularly

**B. Communication**

Details are given in Infrastructure development plan (para 6.3.1)

**C. Incentives and Award**

For management of PA, a motivated frontline staff is necessary requirement therefore it is recommended that suitable appreciation, recognition, award or some incentives should be given to staff who perform outstanding duties.

## **CHAPTER – 11**

### **THE BUDGET**

#### **11.1 General**

The central and state governments are taking keen interest in protection of wildlife and the forests because many forests plants species and wild animals have gone extinct. The state and central governments are providing good budgetary support for protection and conservation of the rare and endangered species of plant and animal. It is the duty of the protected area managers to take keen interest and make sincere efforts, for fulfillment of the objectives of this management plan.

#### **11.2 Period of the Management Plan**

The period of this draft management plan shall be 10 years i.e. with effect from the year 2019-20 to 2028-29.

#### **11.3 Components**

The components and activities proposed to achieve objectives of the management plan have been discussed in detail in Chapter 6. Detailed year wise APOs has been prepared and are annexed as Annexure -XI

#### **11.4 The Budget Plan**

For execution of the proposed activities under this plan, the main source of funding shall be as follows:

1. Centrally Sponsored Scheme (CSS).
2. KOLDAM- CAMPA.
3. JICA
4. BioDCS
5. State Plan



## CHAPTER – 12

### THE SCHEDULE OF OPERATION AND MISCELLANEOUS REGULATIONS

#### 12.1 The Schedule:

An annual action calendar for timely execution of various management activities in the sanctuary has been prepared and given below, which has to be followed strictly for effective management.

All these prescribed activities should be performed every year. These are all routine activities and other new activities like construction of buildings (Guard hut, BO quarter etc.) will be done as per the availability of budget and completion of other necessary formalities.

#### From 2019-2029

S. No.	Activities	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
1	Demarcation of WLS boundaries – Maintenance of Boundary pillars												
2	Group patrolling												
3	Fire protection-												
4	Habitat improvement- AR , ANR and grafting of wild fruit plants/ fruit tree plantation (including maintenance )												
5	Soil and moisture conservation works												
6	Water development including Water harvesting structures												
7	Maintenance of building , path/small bridges/patrolling huts etc												
8	Awareness, training, Exposure,												

S. No.	Activities	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
9	Monitoring programme												
10	Compilation of monitoring results and preparation of reports												
11	Purchase of various items Maintenance of Assets /equipment												
12	Publicity and promotion Ex-gratia payments / compensation												
13	Livestock immunization												
14	Rescue/Mobilization												
15	Publicity and promotion												

The year wise schedule of the operations proposed to be carried out during the plan period w.e.f. the year 2019-20 to 2028-29 is given as Annexure - XI. The component and year – wise abstract of proposals is placed at the end of Annexure - XI.

## 12.2 Record of deviations and implemented targets:

The registers containing the year – wise details of activities proposed under this plan and the works actually executed under various heads will be maintained in Range Office as well as Division Office. This will help in phasing out the annual activities with the framework of the plan from any sector likely to provide funding for the sanctuary. The works not executed at the end of the year shall be marked as balance for the coming financial year.

## 12.3 The record of employment potential

Registers showing the total employment generated will be maintained. This will also show details of man days generated for the weaker sections of the society.

## **12.4 The Control Forms**

The instructions contained in Punjab Leaflet No. 11 regarding maintenance of control forms are followed in the Forest Department. Since no working plan prescription exists for the sanctuaries, only following control forms need to be maintained.

### **a. Control Form No. 4:**

This form containing information on roads and buildings is being maintained and shall be updated regularly.

### **b. Felling:**

The forms containing removal of trees by the right holders at concessional rates and free grant of inferior species as per settlement rights enjoyed by the right holders up to 2003-04 had been maintained. After 2003-04 no timber was sanctioned to right holders and the register has been maintained as Nil upto 31-3-2019.

### **c. Regeneration and Plantations:**

Maintenance of control form 'C' for all plantations (Annexure- XII) will be continued.

## **12.5 Maintenance of compartment history**

The compartment history files have been maintained in respect of petty removals by right holders, areas closed of planting of trees, medicinal plants or grasses and beating up operations. The description of compartments will be recorded afresh after at least an interval of ten years.

## **12.6 Use of Pocket field guide for plan implementers**

A pocket guide is required to be prepared at beat level and provided to the Forest Guards, Block Officer and Range Officer with a copy in Division Office. Besides, containing a map, the guide should contain information on works carried out in past. It shall also include the information regarding various physical features important for wildlife management. This needs to be regularly updated.

## 12.7 Review of Management plan

Management of Protected area is a dynamic process and due to change in local environment, Government policies and rules, technological advancement and local requirement, various management initiatives have to be changed or modified accordingly. For effective and better management following procedure is suggested to review the Management Plan



Source – Lockwood 2006

- It is suggested that every year all the monitoring and evaluation data will be compiled and analyzed during the month of April and May. Based on this analysis APO for the next year will be modified.
- For protection, strategies and actions have to be dynamic and continuous adjustments will be required based on results of monitoring. Priority actions has to be decided to utilize the limited resources available with park authorities to get the maximum output/outcome.
- After 5 year, Management Plan have to be reviewed by an Expert Committee constituted by CWLW Himachal Pradesh. This review will be strategic review and all the component of Management plan including Vision, Goals and Objectives will be reviewed to make it updated as per current policies, rules and requirements.

# **PART – III**

## **Annexures**

# Annexure - I

PUNJAB GOVT. GAZETTE, MARCH 12, 1954

DEVELOPMENT DEPARTMENT.  
The 28th February 1954.

No. 70.GP.55/97. In exercise of the powers conferred by section 8 of Punjab wild birds and Wild animals Protection Act, 1933, the Governor of Punjab is pleased to declare that six weeks after the date of the publication of this notification the following forests situated in the Kullu Sub-Divisions of the Kangra District, as detailed below shall be sanctuaries for wild birds and wild animals:-

S.No.	Forest Range.	Kothi.	Name of game Area.	Boundaries.
			sanctuary and (acres).	
			forests included	
			in the same.	
1.	Upper Kullu.	Manali.	Manalsu Khad, 2/5 Bungdwari and 2/6 Monalgahr.	7.167. North:-Demarcate line of compartment V of 2/5 Bungdwari. East:- 1/1 Bajrundi demarcated forest and demarcated line of 2/5 Bungdwari C.I. South:- Banasu Nal and demarcated line of 2/6 C.IV. West:- Natural limit of Forest.
2.	Lower Kullu	Kais.	Kais; all protected forests included in 3.2.79 catchment of Kais 3.2.79.Nal, i.e. 2/32 Kati Kochhar C.I, II, III, V(Part), VI, VII(Part) and VIII & Kais. III.	North:- Demarcating line separating 2/32 Matikochhar and 2/27 Padra Reas and 2/26 Marhauri and Kais Nal. East:- Ridge separating VII(Part) and VIII & Reas and Parbatti. South:- Compartment VII and V of 2/32 Matikochhar and spur descending from Dhara to Kais Nal.
3.	Lower Kullu	Khokhan.	Dohranal 2/65 Griban and 2/66 Lot Bahaleg R/10, Niaragahr, 2/64, Mujag, 1/43 Nagri and Khokhan III. 3.706	West:- Beas River. North:- Mohal Khad. South:- District Mandi and R/11 Dukam. East:- 1/44 Kawagahr and 3/45 Charawat. West:- R/O Rajgiri & C.V. of 2/63 Matiana.
4.	Parbatti Range.	Kanawar.	Grshan Nal R/3 Graban, 2/9 Reona, 1/9 Khobas C.II & Kanawar III and R/4 Kasol, C.II, III IV, V & VII.	13.435 North:-Parbatti River. South:-Range boundary of Parbatti and Hurla Ranges. East:-1/9, Khobas C.I d, 2/8 Shitalgahr. 2/1 Tilalotan Demarcated forests. West:-2/13 Muri, 2/10 Surampat and C.VI of R/4 Kasol.

## Annexure - II

(Authoritative English Text of this Department Notification No. FFE-B-F(6) 11/ 2005-II,  
Dated 7<sup>th</sup> June, 2013 as required under Articles 348 (3) of the Constitution of India).

### GOVERNMENT OF HIMACHAL PRADESH DEPARTMENT OF FORESTS

No. FFE-B-F(6)-11/2005-II/ Manali

Dated Shimla-2, the 7<sup>th</sup> June, 2013

#### NOTIFICATION

Whereas a Notification under Section 8 of the Punjab Wild Birds and Wild Animals Protection Act 1933 was issued vide Punjab Government Notification No. 70 GP 53/97 dated 28-02-1954, to declare Manali as Wildlife Sanctuary comprising an area of 29.00 sq. km;

And whereas, the matter with regard to rationalization of Wildlife Sanctuaries and National Parks in Himachal Pradesh was under consideration of the Hon'ble Supreme Court in IA No. 139/2010 in Writ Petition Civil No. 1337 of 1995 titled Centre for Environmental Law (MFL) Versus Union of India & Others;

And whereas, in pursuance to the Hon'ble Supreme Court order dated 7<sup>th</sup> May 2010, the State Government issued intention Notifications under Section 18 of the Wildlife (Protection) Act, 1972, in respect of the Wildlife Sanctuaries and National Parks for which rationalization had been proposed;

And whereas, the Hon'ble Supreme Court vide order dated 05/08/2011, further directed the State Government to follow the procedure laid down under Section 18 to 26A and 35 of the Wildlife (Protection) Act, 1972 before issuance of final Notifications under Section 26A of the Wildlife (Protection) Act 1972, which procedure was duly followed;

And whereas, the Hon'ble Supreme Court vide order dated 01/02/2013 passed in IA No. 155 (earlier IA No. 139/2010), has permitted the State Government to issue final Notifications under Sections 26A, 35(4) & 36A of the Wildlife (Protection) Act, 1972 with regard to the proposed rationalization of boundaries of the Wildlife Sanctuaries and National Parks in Himachal Pradesh;

Now, therefore, the Governor Himachal Pradesh in exercise of the powers vested in her under Section 26A of the Act ibid is pleased to declare an area of 29.00 sq. km of Manali as '**Manali Wildlife Sanctuary**' with immediate effect for the purpose of protecting, propagating and developing wildlife and its environment.

The limits of Manali Wildlife Sanctuary shall be as under:

Sr. No.	Name of Wildlife Sanctuary	Constituents i) District ii) Forest Division	Boundaries of Manali Wildlife Sanctuary.
1.	Manali	i) Kullu ii) Kullu WL Division	<p><b>NORTH:</b> Demarcation line of compartment V of 2/5 Bungdwari forest along point 3377 mtr.</p> <p><b>EAST:</b> 1/1 Bajrundi demarcated forest and demarcated line of 2/5 Bungdwari CI and cultivation limits.</p> <p><b>SOUTH:</b> Banaun nalla and demarcated line of 2/6 CIV Monal Gahr.</p> <p><b>WEST:</b> Natural limit of Forest upto demarcated line of compartment V of 2/5 Bungdwari forest.</p>

This area is situated within the Geo-coordinates North Lat.  $32^{\circ}16'07''N$  & Long.  $77^{\circ}08'11''E$  East Lat.  $32^{\circ}14'03''N$  & Long.  $77^{\circ}11'03''E$ , South Lat.  $32^{\circ}13'06''N$  & Long.  $77^{\circ}07'20''E$  West Lat.  $32^{\circ}14'10''N$  & Long.  $77^{\circ}02'34''E$  which falls on Survey of India topo sheet No. 52 H/3 & 52 H/4 on scale 1: 50000.

Area of Manali Wildlife Sanctuary = 29 sq. km.

By Order

Principal Secretary (Forests) to the  
Government of Himachal Pradesh.

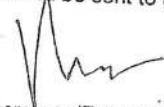


Endst. No As above

Dated Shimla-2 the 7<sup>th</sup> June, 2013

Copy forwarded to:-

1. All the Administrative Secretaries to the Govt. of H.P. Shimla-2.
2. All the Divisional Commissioners, Shimla, Mandi & Dharamshala, H.P.
3. All the Heads of Departments of H.P.
4. The Principal Chief Conservator of Forests, H.P. Shimla-1
5. The Principal Chief Conservator of Forests, (Wildlife) H.P. Shimla-1.
6. All CCFs / DFOs (Wildlife) in H.P.
7. All the Deputy Commissioners in H.P.
8. All the CCFs/CFs /DFOs in H.P.
9. ALR-cum- Under Secretary (Law) to the Government of Himachal Pradesh.
10. The Commissioner, Municipal Corporation, Shimla.
11. The Controller H.P. Printing & Stationary Department Shimla-5 for publication in the Raj-Patra (Extra-ordinary) Five Copies of the Raj-Patra be sent to this Department.
12. Guard File.

  
Under Secretary (Forests) to the  
Government of Himachal Pradesh.

**Annexure - III**  
**Check List of Flora**

Botanical name	Local Name	English Name	Botanical name	Local Name	English Name
<b>a) Trees</b>			<b>D) Herbs</b>		
<i>Abies pindrow</i>	Tosh	Silver Fir	<i>Cannabis sativa</i>	Bhang	Common hemp
<i>Acer caesium</i>	Mandru	Maple	<i>Delphinium elatum</i>	-	Larkspur
<i>Aesculus indica</i>	Khanor	Horse Chest Nut	<i>Fragaria vesca</i>		Wild strawberry
<i>Alnus nitida</i>	Kosh	Alder	<i>Gentiana kurrooa</i>	Karu	-
<i>Cedrela serrata</i>	Darl	Hill Toon	<i>Gerardiana heterophylla</i>	Bichhu buti	Indian Nettle
<i>Cedrus deodara</i>	Diyar	Cedar	<i>Impatiens roylei</i>	Masha	Balsam
<i>Celtis australis</i>	KhiraK	European Nettle tree	<i>Iris nepalensis</i>	Kharaera	Iris
<i>Juglans regia</i>	Akhrot	Walnut	<i>Juniperus recurva</i>	Dhoop	Juniper
<i>Picea smithiana</i>	Rai	Spruce	<i>Metha sylvestris</i>	Pudina	Mint
<i>Pinus wallichiana</i>	Kail	Blue Pine	<i>Podophyllum hexandrum</i>	Ban Kakari	Indian May Apple
<i>Populus ciliate</i>	Pharari Pipal	Poplar	<i>Polygonum alatum</i>	Malora	Knotweed
<i>Prunus cornuta</i>	Jamu	Bird Cherry	<i>Jurinea macrocephala</i>	Dhoop	
<i>Quercus dilatata</i>	Mohru	Green Oak	<i>Primula vulgaris</i>		Primerose
<i>Quercus glauca</i>	Banni		<i>Ranunculus arvensis</i>		Corn buttercup
<i>Quercus semicarpifolia</i>	Kharsu	Brown Oak	<i>Salvia spp</i>		Sage
<i>Rhododendron campanulatum</i>	Brah	Rhododendron	<i>Saxifraga legulata</i>		
<b>B) Shrubs</b>			<i>Thymus serpyllum</i>	Ban Ajwain	Wild thyme
<i>Zanthoxylum alatum</i>	Tirmira	Winged prickly Ash	<i>Valeriana hardwickii</i>	Nihani	
<i>Cotoneaster bacillaris</i>	Reunsh	Open fruited cotoneaster	<i>Valeriana wallichii</i>	Mushkwala	
<i>Indigofera gerardiana</i>	Kathi	-	<i>Viola serpens</i>	Banafsha	
<i>Potentilla fruticosa</i>		Cinquefoil			
<i>Prinsipea utilis</i>	Bhekhal	Himalayan cherry prinsepea			
<i>Rubus ellipticus</i>	Akha	Yellow Himalayan Raspberry			
<i>Sarcococca saligna</i>	Charabari	Willow leaf sweet box			
<i>Viburnum grandiflorum</i>	Thalana	Himalayan Viburnum			
<i>Arundinaria falcata</i>	Nirgal	Hill bamboo			
<b>C) Climbers</b>					
<i>Dioscorea deltoidea</i>	Shingli Mingli	Yam			
<i>Hedra helix</i>	Gumera	Ivy			
<i>Rosa moschata</i>	Kuja	Musk rose			
<i>Clematis Montana</i>	Boldh Kuja	White anemone clematis			

**Annexure – IV**  
**Check List of Animals**

<b>Sr. No.</b>	<b>English Name</b>	<b>Scientific Name</b>
1.	Leopard	<i>Panthera uncia</i>
2.	Jungle Cat	<i>Felis chaos</i>
3.	Leopard Cat	<i>Felis bengalensis</i>
4.	Himalayan Yellow Throated Marten	<i>Martes flavigula</i>
5.	Flying squirrel	<i>Petaurista petaurista</i>
6.	Ghoral	<i>Nemorhaedus goral</i>
7.	Barking Deer	<i>Muntiacus muntjac</i>
8.	Langur	<i>Presbytis entellus</i>
9.	Monkey	<i>Macaca mullata</i>
10.	Black Bear	<i>Selenarctos thibetanus</i>
11.	Indian Porcupine	<i>Hystrix indica</i>
12.	Indian Fox	<i>Vulpes bengalensis</i>
13.	Musk Deer	<i>Moschus leucogaster</i>
14.	Brown Bear	<i>Ursus arctos</i>
<b>Reptiles</b>		
1.	Himalayan Ground Skink	<i>Scincella himalayanus</i>
2.	Rat Snake	<i>Ptyas mucosus</i>
3.	Himalayan Pit Viper	<i>Halys himalayanus</i>
4.	Kashmir Rock Agama	<i>Laudakia tuberculata</i>

**Annexure – V**  
**Check List of Common Birds of Manali**  
**(including Manali Sanctuary and Town)**

*by Trevor Price, Jennifer Zee, Kartika Jamdar & Nitin Jamdar. May 2004*

ORDER: GALLIFORMES	
<b>Family: Phasianidae</b>	
Tibetan Snowcock	<i>Tetraogallus tibetanus</i>
Western Tragopan	<i>Tragopan melanocephalus</i>
Koklass Pheasant (Koklas Pheasant)	<i>Pucrasia macrolopha</i>
Himalayan Monal (Impeyan Pheasant)	<i>Lophophorus impejanus</i>
ORDER: PICIFORMES	
<b>Family: Picidae</b>	
Brown-fronted Woodpecker (Brown-fronted Pied Woodpecker)	<i>Dendrocopos auriceps</i>
Himalayan Woodpecker (Himalayan Pied Woodpecker)	<i>Dendrocopos himalayensis</i>
Scaly-bellied Woodpecker (Scaly-bellied Green Woodpecker)	<i>Picus squamatus</i>
Grey-headed Woodpecker (Black-naped Green Woodpecker)	<i>Picus canus</i>
<b>Family: Megalaimidae</b>	
Great Barbet (Great Himalayan Barbet)	<i>Megalaima virens</i>
ORDER: UPUPIFORMES	
<b>Family: Upupidae</b>	
Common Hoopoe	<i>Upupa epops</i>
ORDER: CORACIIFORMES	
<b>Family: Alcedinidae</b>	
Common Kingfisher (Small Blue Kingfisher)	<i>Alcedo atthis</i>
<b>Family: Halcyonidae</b>	
White-throated Kingfisher	<i>Halcyon smyrnensis</i>
ORDER: CUCULIFORMES	
<b>Family: Cuculidae</b>	
Eurasian Cuckoo (The Cuckoo, Common Cuckoo)	<i>Cuculus canorus</i>
Oriental Cuckoo (Himalayan Cuckoo)	<i>Cuculus saturatus</i>
Lesser Cuckoo	<i>Cuculus poliocephalus</i>

ORDER: APODIFORMES	
<b>Family: Apodidae</b>	
Himalayan Swiftlet (Edible-nest Swiftlet)	<i>Collocalia brevirostris</i>
Fork-tailed Swift (Large White-rumped Swift)	<i>Apus pacificus</i>
ORDER: STRIGIFORMES	
<b>Family: Strigidae</b>	
Tawny Owl (Tawny Wood Owl)	<i>Strix aluco</i>
Collared Owlet	<i>Glaucidium brodiei</i>
ORDER: COLUMBIFORMES	
<b>Family: Columbidae</b>	
Rock pigeon (Blue Rock Pigeon)	<i>Columba livia</i>
Snow Pigeon	<i>Columba leuconota</i>
Speckled Wood Pigeon	<i>Columba hodgsonii</i>
Oriental Turtle Dove (Rufous Turtle Dove)	<i>Streptopelia orientalis</i>
ORDER: GRUIFORMES	
<b>Family: Scolopacidae</b>	
<b>Scolopacinae</b>	
Eurasian Woodcock	<i>Scolopax rusticola</i>
<b>Tringinae</b>	
Common Sandpiper	<i>Actitis hypoleucos</i>
<b>Family: Accipitridae</b>	
<b>Accipitrinae</b>	
Lammergeier (Bearded Vulture)	<i>Gypaetus barbatus</i>
Himalayan Griffon (Himalayan Griffon Vulture)	<i>Gyps himalayensis</i>
Eurasian Sparrowhawk (Sparrow Hawk)	<i>Accipiter nisus</i>
Golden Eagle	<i>Aquila chrysaetos</i>
Booted Eagle (Booted Hawk Eagle)	<i>Hieraaetus pennatus</i>
<b>Family: Falconidae</b>	
Common Kestrel (Kestrel, Eurasian Kestrel)	<i>Falco tinnunculus</i>
Eurasian Hobby (Hobby, Northern Hobby)	<i>Falco subbuteo</i>
<b>Family: Laniidae</b>	
<b>Corvinae</b>	
Yellow-billed Blue Magpie (Gold-billed Magpie)	<i>Urocissa flavirostris</i>
Grey Treepie (Himalyan Treepie)	<i>Dendrocitta formosae</i>

Spotted Nutcracker (Nutcracker/Eurasian)	<i>Nucifraga caryocatactes</i>
Red-billed Chough	<i>Pyrrhocorax pyrrhocorax</i>
Large-billed Crow (Jungle/Black Crow)	<i>Corvus macrorhynchos</i>
<b>Oriolini</b>	
Eurasian Golden Oriole (Golden Oriole)	<i>Oriolus oriolus</i>
Long-tailed Minivet	<i>Pericrocotus ethologus</i>
<b>Dicrurinae</b>	
<b>Rhipidurini</b>	
Yellow-bellied Fantail (Yellow-bellied Fantail Flycatcher)	<i>Rhipidura hypoxantha</i>
<b>Dicrurini</b>	
Ashy Drongo (Grey Drongo)	<i>Dicrurus leucophaeus</i>
<b>Monarchini</b>	
Asian Paradise-flycatcher (Paradise-flycatcher)	<i>Terpsiphone paradisi</i>
<b>Family: Cinclidae</b>	
Brown Dipper	<i>Cinclus palace</i>
<b>Family: Muscicapidae</b>	
<b>Turdinae</b>	
Blue-capped Rock Thrush (Blue-headed Rock Thrush)	<i>Monticola cinclorhynchus</i>
Chestnut-bellied Rock Thrush	<i>Monticola rufiventris</i>
Blue Whistling Thrush (Whistling Thrush)	<i>Myophonus caeruleus</i>
Plain-backed Thrush (Plain-backed Mountain Thrush)	<i>Zoothera mollissima</i>
Long-tailed Thrush (Long-tailed Mountain Thrush)	<i>Zoothera dixonii</i>
Scaly Thrush (Speckled Mountain Thrush)	<i>Zoothera dauma</i>
Tickell's Thrush (Indian Grey Thrush)	<i>Turdus unicolor</i>
White-collared Blackbird	<i>Turdus albocinctus</i>
Grey-winged Blackbird	<i>Turdus boulboul</i>
Eurasian Blackbird	<i>Turdus merula</i>
Chestnut Thrush (Grey-headed Thrush)	<i>Turdus rubrocanus</i>
Mistle Thrush	<i>Turdus viscivorus</i>
Gould's Shortwing	<i>Brachypteryx stellata</i>
<b>Muscicapinae</b>	
<b>Muscicapini</b>	
Dark-sided Flycatcher (Sooty Flycatcher)	<i>Muscicapa sibirica</i>
Rusty-tailed Flycatcher (Rufous-tailed Flycatcher)	<i>Muscicapa ruficauda</i>
Rufous-gorgeted Flycatcher (Orange-gorgeted Flycatcher)	<i>Ficedula strophilata</i>

Ultramarine Flycatcher (White-browed Blue Flycatcher)	<i>Ficedula superciliaris</i>
Slaty-blue Flycatcher	<i>Ficedula tricolor</i>
Verditer Flycatcher	<i>Eumyias thalassina</i>
Grey-headed Canary Flycatcher (Grey-headed Flycatcher)	<i>Culicicapa ceylonensis</i>
<b>Saxicolini</b>	
Indian Blue Robin (Blue Chat)	<i>Luscinia brunnea</i>
Orange-flanked Bush Robin (Red-flanked Bluetail)	<i>Tarsiger cyanurus</i>
Golden Bush Robin	<i>Tarsiger chrysaeus</i>
White-browed Bush Robin	<i>Tarsiger indicus</i>
Oriental Magpie Robin (Magpie Robin Dayal)	<i>Copsychus saularis</i>
Blue-fronted Redstart	<i>Phoenicurus frontalis</i>
White-capped Water Redstart (White-capped Redstart)	<i>Chaimarrornis leucocephalus</i>
Plumbeous Water Redstart (Plumbeous Redstart)	<i>Rhyacornis fuliginosus</i>
White-bellied Redstart (Hodgson's Shortwing)	<i>Hodgsonius phaenicuroides</i>
Little Forktail	<i>Enicurus scouleri</i>
Spotted Forktail	<i>Enicurus maculatus</i>
Common Stonechat (Collared Bushchat)	<i>Saxicola torquata</i>
Grey Bushchat (Dark-grey Bushchat)	<i>Saxicola ferrea</i>
<b>Family: Sturnidae</b>	
Common Myna	<i>Acridotheres tristis</i>
Jungle Myna	<i>Acridotheres fuscus</i>
<b>Family: Sittidae</b>	
<b>Sittinae</b>	
White-cheeked Nuthatch	<i>Sitta leucopsis</i>
<b>Family: Certhiidae</b>	
<b>Certhini</b>	
Eurasian Treecreeper (Tree Creeper, Common Treecreeper)	<i>Certhia familiaris</i>
Bar-tailed Treecreeper (Himalayan Treecreeper)	<i>Certhia himalayana</i>
<b>Troglodytinae</b>	
Winter Wren (Wren, Northern Wren)	<i>Troglodytes troglodytes</i>
<b>Family: Paridae</b>	
<b>Remizinae</b>	
Fire-capped Tit	<i>Cephalopyrus flammiceps</i>
<b>Parinae</b>	
Rufous-vented Tit (Rufous-bellied Crested Tit)	<i>Parus rubidiventris</i>
Spot-winged Tit (Crested Black Tit, Black-crested Tit)	<i>Parus melanolophus</i>

Grey-crested Tit (Brown Crested Tit, Crested Brown Tit)	<i>Parus dichrous</i>
Great Tit (Grey Tit)	<i>Parus major</i>
Green-backed Tit	<i>Parus monticolus</i>
Yellow-browed Tit	<i>Sylviparus modestus</i>
<b>Family: Aegithalidae</b>	
Black-throated Tit (Red-headed Tit)	<i>Aegithalos concinnus</i>
White-throated Tit	<i>Aegithalos niveogularis</i>
<b>Family: Hirundinidae</b>	
Northern House Martin (House Martin, Common House Martin)	<i>Delichon urbica</i>
<b>Family: Regulidae</b>	
Goldcrest	<i>Regulus regulus</i>
<b>Family: Pycnonotidae</b>	
Himalayan Bulbul (White-cheeked Bulbul)	<i>Pycnonotus leucogenys</i>
<b>Family: Zosteropidae</b>	
Oriental White-eye (White-eye)	<i>Zosterops palpebrosus</i>
<b>Family: Sylviidae</b>	
<b>Acrocephalinae</b>	
Chestnut-headed Tesia (Chestnut-headed Ground Warbler)	<i>Tesia castaneocoronata</i>
Brownish-flanked Bush Warbler (Strong-footed Bush Warbler)	<i>Cettia fortipes</i>
Aberrant Bush Warbler	<i>Cettia flavolivacea</i>
Grey-sided Bush Warbler (Rufous-capped Bush Warbler)	<i>Cettia brunnifrons</i>
Spotted Bush Warbler	<i>Bradypterus thoracicus</i>
Tickell's Leaf Warbler (Tickell's Warbler)	<i>Phylloscopus affinis</i>
Buff-barred Warbler (Orange-barred Leaf Warbler)	<i>Phylloscopus pulcher</i>
Ashy-throated Warbler (Grey-faced Leaf Warbler)	<i>Phylloscopus maculipennis</i>
Lemon-rumped Warbler (Pallas's Leaf Warbler)	<i>Phylloscopus chloronotus</i>
Hume's Warbler (Yellow-browed Warbler)	<i>Phylloscopus humei</i>
Greenish Warbler (Dull Green Leaf Warbler)	<i>Phylloscopus trochiloides</i>
Large-billed Leaf Warbler (Large-billed Tree Warbler)	<i>Phylloscopus magnirostris</i>
Western Crowned Warbler (Large Crowned Leaf Warbler)	<i>Phylloscopus occipitalis</i>
Blyth's Leaf Warbler (Crowned)	<i>Phylloscopus reguloides</i>
Whister's Warbler	<i>Seicercus whistleri</i>
Grey-hooded Warbler (Grey-headed Flycatcher Warbler)	<i>Seicercus xanthoschistos</i>
Grey-cheeked Warbler (Grey-cheeked Flycatcher Warbler)	<i>Seicercus poliogenys</i>



<b>Garrulacinae</b>	
Streaked Laughingthrush	<i>Garrulax lineatus</i>
Variegated Laughingthrush	<i>Garrulax variegatus</i>
Chestnut-crowned Laughingthrush (Red-headed Laughingthrush)	<i>Garrulax erythrocephalus</i>
<b>Sylviinae</b>	
<b>Timaliini</b>	
Scaly-breasted Wren Babbler (Greater Scaly-breasted Wren Babbler)	<i>Pnoepyga albiventer</i>
Nepal Wren Babbler	<i>Pnoepyga immaculata</i>
Chestnut-tailed Minla (Bar-throated Siva/Minla)	<i>Minla strigula</i>
Rufous Sibia (Black-capped Sibia)	<i>Heterophasia capistrata</i>
White-naped Yuhina	<i>Yuhina bakeri</i>
<b>Family: Nectarinae</b>	
Fire-tailed Sunbird	<i>Aethopyga ignicauda</i>
<b>Family: Passeridae</b>	
<b>Passerinae</b>	
House Sparrow	<i>Passer domesticus</i>
Russet Sparrow (Cinnamon Tree Sparrow)	<i>Passer rutilans</i>
<b>Motacillinae</b>	
White Wagtail (Pied Wagtail)	<i>Motacilla alba</i>
White-browed Wagtail (Large Pied Wagtail)	<i>Motacilla maderaspatensis</i>
Grey Wagtail	<i>Motacilla cinerea</i>
Olive-backed Pipit (Indian Tree Pipit, Olive Tree Pipit)	<i>Anthus hodgsoni</i>
Rosy Pipit (Vinaceous-breasted Pipit)	<i>Anthus roseatus</i>
<b>Prunellinae</b>	
Rufous-breasted Accentor	<i>Prunella strophiatea</i>
<b>Estrildinae</b>	
Scaly-breasted Munia (Spotted Munia, Nutmeg Mannikin)	<i>Lonchura punctulata</i>
<b>Family: Fringillidae</b>	
<b>Fringillini</b>	
Chaffinch (Common Chaffinch)	<i>Fringilla coelebs</i>
<b>Carduelini</b>	
Yellow-breasted Greenfinch (Himalayan Greenfinch)	<i>Carduelis spinoides</i>
European Goldfinch (Goldfinch, Eurasian Goldfinch)	<i>Carduelis carduelis</i>
Plain Mountain Finch (Hodgson's Mountain Finch)	<i>Leucosticte nemoricola</i>
Spectacled Finch (Red-browed Finch)	<i>Callacanthus burtoni</i>
Dark-breasted Rosefinch	<i>Carpodacus nipalensis</i>

(Nepal Rosefinch)	
Common Rosefinch	<i>Carpodacus erythrinus</i>
Pink-browed Rosefinch	<i>Carpodacus rodochrous</i>
Red-headed Bullfinch	<i>Pyrrhula erythrocephala</i>
Black-and-yellow Grosbeak	<i>Mycerobas icteroides</i>
Collared Grosbeak (Allied Grosbeak)	<i>Mycerobas affinis</i>
Spot-winged Grosbeak (Spotted-winged Grosbeak)	<i>Mycerobas melanozanthos</i>
White-winged Grosbeak	<i>Mycerobas carnipes</i>
<b>Emberizinae</b>	
Rock Bunting (Eurasian Rock-Bunting)	<i>Emberiza cia</i>
Chestnut-eared Bunting (Grey-headed Bunting)	<i>Emberiza fucata</i>

## Annexure - VI

### Forest Wise Recorded rights of people existing in the Protected Area

Name of the Forest	Name of the village	Rights Admitted	Remarks
<b>2/5 Bangdwari</b>	Manali	Full rights cattle grazing of the village allowed in Kumsu, Rebkan, Khanpari, Damana, Ramorang, Kralsu, Mandraun (Khwkta Koot) and Gramling thaches.	All Rights suspended since July, 2004 vide MoEF letter No. 1-26/CEC/2003 dated 2.07.2004 (Supreme court order dated 14.02.2000 in IA No. 548.)
<b>2/6 Monal Gahar</b>	Manali Dhungari Banaun and Sanogi  Banon Sanogi  Balsari    Manali Kothi	Building Timber Building timber and Fuel wood Building timber, fuel wood, agricultural implements, and sheep grazing.  Cattle grazing of these villages is allowed in Samiala-ra-thach, Kain, Lambadugh, Madhog (Barog), Bajaun, Gulain, Gora-dugh, Thanu-ra-dugh, Dapandi, Lanant, Dorni Chibu da lasa thaches.  Collection of Karu, Patish, Bhoj Patra and such like minor forest produce.	

Annexure - VII

No. FFE-B.F(6)-///99-  
Government of Himachal Pradesh,  
Department of Forests.

IMMEDIATE

From:

The Commissioner-cum-Secy(Forests) to the  
Government of Himachal Pradesh.

To

✓ The Chief Wildlife Warden,  
Himachal Pradesh, Shimla-171001.

Dated Shimla-171002 the 16<sup>th</sup> Oct. 1999.

Subject:-

SLP-(C)-337 of 1998-titled Centre for Environment  
Law-WWF-I-dt.10.11.1998-Notification regarding  
Wildlife Sanctuary.

Sir,

Jai Hind.

I am directed to refer to your letter No. C-XI-I/  
3924- dated 23.8.1999 on the subject cited above and to say that  
the matter with regard to the issuance of Notification under  
Section 26(A) of Wildlife(Protection) Act, 1972 was examined in  
detail by the Administrative Department in consultation with  
Law Department and it has been advised that Government of Punjab  
in exercise of the powers conferred by section 3 of Punjab Wild  
birds and Wild animals Protection Act, 1933 issued a Notification  
No.79-GP-53/97-dated 28.2.1954 declaring Kothis/Ranges Manali,  
Kias, Kachhan and Kanawar as Sanctuaries for wild birds and Wild  
animals. These sanctuaries were to come into existence after six  
weeks from the date of publication of the said notification.  
The Notification was published in Punjab Government Gazette dated  
12.3.1954. Meaning thereby legally these sanctuaries had already  
come into existence with effect from 12.3.1954. Accordingly  
to Section 3 of the Punjab Wild birds and Wild animals Protection  
Act, 1933 the local Government was competent to declare any area  
whether it was a public property or a private property to be a  
sanctuary. The proposal of the Department to declare the same  
sanctuaries already declared as Sanctuaries under Wild Life  
(Protection) Act, 1972. The Law Department is of the opinion  
that there is no need to declare these areas again as Sanctuaries  
under the 1972 Act as these sanctuaries were validly declared  
as Sanctuaries under the Punjab Act and the operation of Wild  
Life(Protection) Act, 1972 which is a Central Act in no manner  
Contrs.P.2.

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affect the Constitution of said sanctuaries. The Section 66 of the Wild Life (Protection) Act, 1972 no doubt repeals every other Act in force in a State yet sub-section (2) of Section 66 containing non-obstante clause providing that anything done or any action taken under the Act as repealed including Notification, order, etc. which is not inconsistent with the provisions of this Act, be deemed to have been done or taken under the corresponding provisions of this Act. Since the Notification issued under the Punjab Act is not inconsistent with the provisions of Wild Life (Protection) Act, 1972 and thus stands saved by Section 66(2) of the Act itself. Therefore, there is no need to issue fresh Notifications under 1972 Act and the Notification issued under the Punjab Act is valid.

2. In the light of the above detailed advice of the Law Department the Administrative Department also endorses the same view in the matter accordingly for your information and records.

Yours faithfully,

*[Signature]*  
Asstt. Secretary (Forests) to the  
Government of Himachal Pradesh.

Enclst. No. FFE-B-F(6)-11/99-Dated Shimla-2 the 11th Oct. 1999.  
Copy forwarded to:-

- R*  
*mp*
1. File No. FFE-B-F(6)-10/99 relating to Wildlife Sanctuary, Manali, District Kullu, H.P.
  2. File No. FFE-B-F(6)-12/99-relating to Wildlife Sanctuary, Khokhan, District Kullu, H.P.
  3. File No. FFE-B-F(6)-13/99-relating to Wildlife Sanctuary, Kanawar, District Kullu, H.P.

*S.H.*  
Asstt. Secretary (Forests) to the  
Government of Himachal Pradesh.

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**Annexure - VIII**  
**List of building of Manali Wildlife Range**

<b>Sr. No.</b>	<b>Name of the Building</b>	<b>Year of Construction</b>	<b>Cost Incurred</b>
1.	Range office cum residence	1980-81	99100.00
2.	Forest Guard Hut Manali-1	1980-81	42330.00
3.	Deputy Ranger Quarter	1980-81	48100.00
4.	Forest Guard Hut Manali-2	1989-90	73455.00
5.	Dy. Ranger Quarter near I/Centre	1994-95	145656.00
6.	Forest guard hut near pheasantry	1994-95	200000.00
7.	Trekker Hut at Upparuar	1992-93	NA
8.	Information Centre Manali	1993-94	2975000.00
9.	Patrolling Hut at Lamba dug	2012-13	150000.00
10.	Library near I/Centre	2016-17	1000000.00

## Annexure - IX

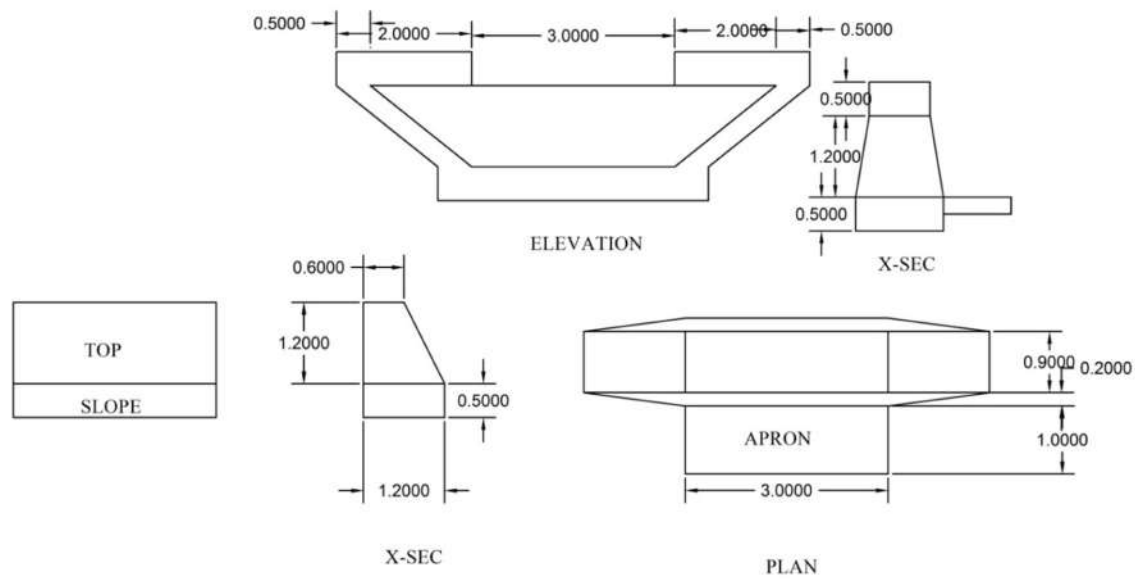
### List of roads and paths in Manali wildlife sanctuary

S. No.	Name of road and path	Year of construction	Length (Km)
1	Jeepable road from Manali to Monal Gahar	NA	2.0
2.	B/Path old Manali to Upper Ruad	1930-33	2.0
3.	B/path Manali to Dohrni	1945-46 1991-92	10.0 7.80
4	I/path 2/5 Bangdwari CI to CIIa	1991-92	12.5
5.	I/path 2/6 Gorudug to 2/6 Lambadug	NA	5.4
6.	I/path 2/5 Bangdwari CI	NA	5.2
7.	I/path 2/6 Monalgahar CIII	NA	5.6
8.	I/path old Manali to Upper Ruad	NA	11
9.	New Trekker path constructed from Upper ruard to Patauti	2001-02	6

## Annexure – X

### DESIGN OF CHECK WALL AND CHECK DAMS

#### DESIGN OF DRY STONE MASONRY CHECK WALL AND CHECK DAM





**Annexure – XI**

<b>ANNUAL PLAN OPERATION OF PROTECTED AREA FOR THE YEAR 2019-20 IN RESPECT OF "MANALI WILD LIFE SANCTUARY"</b>							
<b>Item of Work</b>		<b>Location</b>	<b>unit</b>	<b>Rate per Unit</b>	<b>Target</b>		<b>Justification</b>
					<b>Phy</b>	<b>Fin</b>	
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>10</b>
<b>A. Non Recurrent Activities</b>							
<b>Infrastructure Development</b>							
<b>Construction of New building &amp; other structures</b>							
1	Const. of Sitting Places along Path in Manali WLS	Manali WLS	No.	L/s	10	100000	For Visitors
<b>Sub Total</b>						<b>100000</b>	
<b>Soil &amp; Moisture Conservation</b>							
<b>Check walls/ Breast walls/ Retaining wall</b>							
1	2/6 Monalgahar C II,CIII	Monalgahar	No.	L/s	15	300000	To Control Soil Erosion
2	2/5 Bangduari C II ,Titiya	Bangduari	No.	L/s	15	300000	To Control Soil Erosion
3	Check Wall	Manali WLS	No.	15000	15	225000	To Control Soil Erosion
	<b>Water Pond</b>						
1	Lambadug	Monalgahar	No.	L/s	2	60000	To Provide water for wild animal
2	Upperruar	Bangduari	No.	L/s	2	60000	To Provide water for wild animal
3	Water Pond Manali WLS	Manali WLS	No.	15000	5	75000	To Provide water for wild animal
<b>Sub Total</b>						<b>1020000</b>	
<b>Community Development through Participation</b>							
1	Entry Point activity for fringe villagers (Retaining Wall)	Near Deo Nala	Km	20000	8	160000	For Visitor and Villagers near PA
<b>Sub Total</b>						<b>160000</b>	
<b>TOTAL NON RECURRING</b>						<b>1280000</b>	
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	WLS Manali	M/ days	6975	2 for 12 months	167400	To Control poaching in WLS
2	Fire watchers	WLS Manali	M/ day	6975	2 for 6 months	83700	To Control Fire in WLS

			s				
3	Group Patrolling for search operation Etc.	WLS Manali	L/s	L/s	L/S	20000	For Protection of WLS
4	Clearing of Fire lines	WLS Manali	L/s	L/s	L/S	30000	For Control Fire
5	Abundance survey of major faunal species	WLS Manali	L/s	L/s	L/S	50000	Study of Fauna
6	Provision of rewards to the informers	WLS Manali	L/s	L/s	L/S	20000	For better protection of wildlife
7	Group Patrolling for protection of WLS and forest offence.	WLS Manali	L/s	L/s	L/S	50000	For protection of forest & Wild Life
8	Augmentation of Saltlicks	WLS Manali	L/s	L/s	L/S	20000	For wild animals
9	Maint. of fire lines	WLS Manali	km	0.04/Kms.	18 Kms.	72000	To control forest fire for protection fo wild life
10	Hiring of motor vehicle/ POL & maintenance charges	Manali WLS	L/s	L/s	L/S	50000	For proper protection of wildlife and forest wealth
11	Contingencies and Staff travelling expenses	WLS Manali	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff
<b>Sub Total</b>						<b>663100</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	WLS Manali	L/s	L/s	L/S	230000	
2	Publicity material / Signage	WLS Manali	L/s	L/s	L/S	50000	
3	Workshop With people near PA	WLS Manali	L/s	L/s	L/S	100000	For awareness
4	Workshop/Training/ Seminar of Staff	WLS Manali	L/s	L/s	L/S	175000	For awareness & training on wild life techniques
5	Exposure Visit	WLS Manali	L/s	L/s	L/S	100000	For awareness
<b>Sub Total</b>						<b>655000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	WLS Manali	108	300	9 person for 12 Months	32400	Mobile connectivity to field staff
<b>Sub Total</b>						<b>32400</b>	
<b>Nursery</b>							
	<b>Upgrading/improvement of nursery</b>						

1	Raising of nursery plants, etc	Van Vihar Manali Nry	No.	L/s	1	250000	Development/ Improvement & raising of plants
Sub Total						250000	
Infrastructure Development							
Maintenance of Roads/Paths							
Inspection/Bridle paths, etc.							
1	Repair of lawn and Drainage facility in residential colony at Manali	Near Range Office	L/s	L/s	L/s	57800	
2	I/ Path Titiya to Upper ruar	2/5 Bangduari	km	L/s	8	160000	
Sub Total						217800	
TOTAL RECURRING						1818300	
TOTAL RECURRING & NON- RECURRING						3098300	
	Operational Charges					25000	
GRAND TOTAL						3123300	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR 2020-21 IN RESPECT OF "MANALI WILD LIFE SANCTUARY"							
Item of Work			unit	Rate per Unit	Target		Justification
		Location			Phy	Fin	
1	2	3	4	5	6	7	10
<b>A. Non Recurrent Activities</b>							
<b>Infrastructure Development</b>							
<b>Construction of New building &amp; other structures</b>							
1	Const. Of camping Ground at Lambadug	Monalgahar	No.	L/s	3	75000	For visitor and Tracker
<b>Sub Total</b>						<b>75000</b>	
<b>Soil &amp; Moisture Conservation</b>							
<b>Check walls/ Breast walls/ Retaining wall</b>							
1	Check wall at Thera Nala	Monalgahar	No.	20000	10	200000	To Control Soil Erosion
2	Check Wall at Reokan Nala	Bangduari	No.	20000	10	200000	To Control Soil Erosion
<b>Sub Total</b>						<b>400000</b>	
<b>TOTAL NON RECURRING</b>						<b>475000</b>	
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	WLS Manali	M/days	9000	2 for 12 months	216000	To Control poaching in WLS
2	Fire watchers	WLS Manali	M/days	9000	2 for 6 months	108000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	WLS Manali	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint. of fire lines	WLS Manali	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	WLS Manali	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	WLS Manali	L/s	L/s	L/S	20000	For better protection of wildlife
8	Augmentation of Saltlicks	WLS Manali	L/s	L/s	L/S	20000	For wild animals
11	Contingencies and Staff travelling expenses	WLS Manali	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff

12	Combing operation to search traps/nets etc.in the sanctuary	WLS Manali	L/s	L/s	L/S	30000	Combing operation
13	Rescue / transportation of injured wild animals	WLS Manali	L/s	L/s	L/S	20000	For better protection of wildlife
14	Hiring of motor vehicle/ POL & maintenance charges	WLS Manali	L/s	L/s	L/S	10000	To meet with the running cost of official vehicle attached with DFO & staff and hiring of vehicle
15	Mahindra Bolero Camper/ Multipurpose vehicle.	WLS Kais & Manali	No.	L/s	1	800000	Patrolling vehicle for Range Forest Officer & staff at Manali.
16	Bikes for forest guards	WLS Manali	No.	L/s	1	100000	For patrolling/ rescue operations.
17	One Patrolling/ Rescue Vehicle.	Kullu and Manali WL Range	No.	L/s	1	1200000	For Rapid Response Team/ force at Kullu
18	Desktop computer/ Laptop	WLS Manali	No.	L/s	1	50000	Required for Information Centre at Manali.
19	Digital Camera, Trap camera, Video and Surveillance Camera etc.					600000	For protection, patrolling/ rescue operations.
20	Camping Equipments	WLS Manali	L/s	L/s	L/s	200000	For protection, patrolling/ rescue operations.
<b>Sub Total</b>						<b>3644000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	WLS Manali	L/s	L/s	L/S	150000	For awareness
2	Publicity material / Signage	WLS Manali	L/s	L/s	L/S	30000	For awareness
3	Work Shop With people near PA	WLS Manali	L/s	L/s	L/S	40000	For awareness
4	Training/Workshop of Staff	WLS Manali	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	WLS Manali	L/s	L/s	L/S	30000	For office
<b>Sub Total</b>						<b>270000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	WLS Manali	No.	300	7 person for 12 Months	25200	Mobile connectivity to field staff

Sub Total						25200	
Nursery							
	Upgrading/improvement of nursery						
1	Raising of nursery plants, etc.	Van Vihar Nry	No.	L/s	1	150000	Development/ Improvement & raising of plants
Sub Total						150000	
Maintenance of Building /Infrastructure							
1	Repair Of Van Vihar FGD Qtr	Van Vihar	No	L/S	1	80000	Roof Repair
2	Repair Of Qtrs	Near Range Office	No	L/S	2	70000	Iron Grill
Maintenance of Roads/Paths							
Inspection/Bridle paths, etc.							
1	Maint. Of Path Shillathach to Lambadug	Monalgahr	km	L/s	8	160000	I/c stone Cutting
2	Maint. I /Path Titiya to Gulamlung	Bangduari	Km	L/s	5	100000	I/c stone Cutting
Sub Total						410000	
TOTAL RECURRING						4499200	
TOTAL RECURRING & NON-RECURRING						4974200	
	Operational Charges					40000	
GRAND TOTAL						5014200	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR 2021-22 IN RESPECT OF "MANALI WILD LIFE SANCTUARY"							
Item of Work		Location	unit	Rate per Unit	Target		Justification
					Phy	Fin	
1	2	3	4	5	6	7	10
<b>A. Non Recurrent Activities</b>							
<b>Infrastructure Development</b>							
<b>Construction of New building &amp; other structures</b>							
1	Const. of Sitting Places along Road from upper Ruar to Patuati	Manali WLS	No.	L/s	15	75000	For Visitors
<b>Sub Total</b>						<b>75000</b>	
<b>Soil &amp; Moisture Conservation</b>							
<b>Check walls/ Breast walls/ Retaining wall/ Check dam</b>							
3	Water Pond	Manali WLS	No.	L/s	4	120000	To Provide water for animal
<b>Sub Total</b>						<b>120000</b>	
<b>TOTAL NON RECURRING</b>						<b>195000</b>	
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	Manali WLS	M/days	9000	2 for 12 months	216000	To Control poaching in WLS
2	Fire watchers	Manali WLS	M/days	9000	2 for 6 months	108000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	Manali WLS	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint of fire lines	Manali WLS	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	Manali WLS	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
8	Augmentation of Saltlicks	Manali WLS	L/s	L/s	L/S	20000	For wild animals
11	Contingencies and Staff travelling expenses	Manali WLS	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff
12	Combing operation to search traps/nets etc.in the sanctuary	Manali WLS	L/s	L/s	L/S	30000	Combing operation

13	Rescue / transportation of injured wild animals	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
14	Hiring of motor vehicle/ POL & maintenance charges	Manali WLS	L/s	L/s	L/S	25000	To meet with the running cost of official vehicle attached with DFO & staff and hiring of vehicle
<b>Sub Total</b>						<b>709000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	Manali WLS	L/s	L/s	L/S	150000	
2	Publicity material / Signage	Manali WLS	L/s	L/s	L/S	30000	
3	Work Shop With people near PA	Manali WLS	L/s	L/s	L/S	30000	For awareness
4	Training/Workshop of Staff	Manali WLS	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	Manali WLS	L/s	L/s	L/s	30000	
6	Providing of Khakhi jackets and Shoes to Staff	Manali WLS	L/s	L/s	L/S	100000	For staff
<b>Sub Total</b>						<b>360000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	Manali WLS	No.	300	7 person for 12 Months	25200	Mobile connectivity to field staff
<b>Sub Total</b>						<b>25200</b>	
<b>Nursery</b>							
<b>Upgrading/improvement of nursery</b>							
1	Raising of nursery plants, etc	Van Vihar Nry	No.	L/s	1	150000	Development/ Improvement & raising of plants
<b>Sub Total</b>						<b>150000</b>	
<b>Infrastructure Development</b>							
<b>Maintenance of Roads/Paths/ water Pond /Camping Ground</b>							
1	De-siltation of water pond	Manali WLS	No	L/S	4	40000	
<b>Sub Total</b>						<b>40000</b>	
<b>Inspection/Bridle paths, etc.</b>							
1	Maint. Of I/Path Lambadug to Dorni	Monalg ahar	Km	L/s	8	160000	
2	Maint. of I path Kharma to Upperruar	Bangdu ari	Km	L/S	11	220000	



					Sub Total	380000	
Camping Ground							
1	Maint. Of Camping Ground	Manali WLS	No	L/s	L/S	80000	
Sub Total						80000	
TOTAL RECURRING						1744200	
TOTAL RECURRING & NON-RECURRING						1939200	
	Operational Charges					50700	
GRAND TOTAL						1989900	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR 2022-23 IN RESPECT OF "MANALI WILD LIFE SANCTUARY"							
Item of Work		Location	unit	Rate per Unit	Tar get		
					Phy	Fin	Justification
1	2	3	4	5	6	7	10
<b>A. Non Recurrent Activities</b>							
<b>Soil &amp; Moisture Conservation</b>							
<b>Check walls/ Breast walls/ Retaining wall/ Check dam</b>							
1	Check wall at Brog Nala	Monalgahar	No.	L/s	10	200000	To Control Soil Erosion
2	Check Wall at Upper ruar Nala	Bangduari	No.	L/s	10	200000	To Control Soil Erosion
<b>Sub Total</b>						<b>400000</b>	
<b>TOTAL NON RECURRING</b>						<b>400000</b>	
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	Manali WLS	M/days	10500	2 for 12 months	252000	To Control poaching in WLS
2	Fire watchers	Manali WLS	M/days	10500	2 for 6 months	126000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	Manali WLS	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint of fire lines	Manali WLS	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	Manali WLS	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
7	Augmentation of Saltlicks	Manali WLS	L/s	L/s	L/S	20000	For wild animals
8	Contingencies and Staff travelling expenses	Manali WLS	L/s	L/s	L/S	100000	To meet with the Traveling expenses of staff
9	Combing operation to search traps/nets etc.in the sanctuary	Manali WLS	L/s	L/s	L/S	30000	Combing operation
10	Camping Equipment	Manali WLS	L/s	L/s	L/s	20000	Providing facility during patrolling

11	Equipment like digital camera , night vision camera	Manali WLS	L/s	L/s	L/S	100000	
<b>Sub Total</b>						<b>838000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	Manali WLS	L/s	L/s	L/S	150000	
2	Publicity material / Signage	Manali WLS	L/s	L/s	L/S	20000	
3	Work Shop With people near PA	Manali WLS	L/s	L/s	L/S	30000	For awareness
4	Training/Workshop of Staff	Manali WLS	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	Manali WLS	L/s	L/s	L/s	30000	
<b>Sub Total</b>						<b>250000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	Manali WLS	No.	300	7 pers on for 12 Mon ths	25200	Mobile connectivity to field staff
<b>Sub Total</b>						<b>25200</b>	
<b>Nursery</b>							
	<b>Upgrading/improvement of nursery</b>						
1	Raising of nursery plants, etc	Van Vihar Nry	No.	L/s	1	200000	Development/ Improvement & raising of plants
<b>Sub Total</b>						<b>200000</b>	
<b>TOTAL RECURRING</b>						<b>1313200</b>	
<b>TOTAL RECURRING &amp; NON- RECURRING</b>						<b>1713200</b>	
	Operational Charges					50700	
<b>GRAND TOTAL</b>						<b>1763900</b>	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR 2023-24 IN RESPECT OF "MANALI WILD LIFE SANCTUARY"							
Item of Work		Location	unit	Rate per Unit	Target		
					Phy	Fin	Justification
1	2	3	4	5	6	7	10
<b>A. Non Recurrent Activities</b>							
<b>Soil &amp; Moisture Conservation</b>							
<b>Check walls/ Breast walls/ Retaining wall/ Check dam</b>							
1	Check wall at civ monalgahar	Monalgahar	No.	L/s	8	160000	To Control Soil Erosion
2	Check wall at Titiya	Bangduari	No.	L/s	8	160000	To Control Soil Erosion
3	Water Pond	Manali WLS	No.	L/s	4	120000	To Provide water for animal
<b>Sub Total</b>						<b>440000</b>	
<b>TOTAL NON RECURRING</b>						<b>440000</b>	
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	Manali WLS	M/days	10500	2 for 12 months	252000	To Control poaching in WLS
2	Fire watchers	Manali WLS	M/days	10500	2 for 6 months	126000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	Manali WLS	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint of fire lines	Manali WLS	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	Manali WLS	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
7	Augmentation of Saltlicks	Manali WLS	L/s	L/s	L/S	20000	For wild animals
8	Contingencies and Staff travelling expenses	Manali WLS	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff
9	Combing operation to search traps/nets etc.in the sanctuary	Manali WLS	L/s	L/s	L/S	30000	Combing operation
10	Rescue / transportation of injured wild animals	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife

11	Hiring of motor vehicle/ POL & maintenance charges	Manali WLS	L/s	L/s	L/S	25000	To meet with the running cost of official vehicle attached with DFO & staff and hiring of vehicle
12	Repair of Boundary Pillar small	Manali WLS	L/s	L/s	18	144000	Demarcation of boundary
<b>Sub Total</b>						<b>907000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	Manali WLS	L/s	L/s	L/S	150000	
2	Publicity material / Signage	Manali WLS	L/s	L/s	L/S	30000	
3	Work Shop With people near PA	Manali WLS	L/s	L/s	L/S	30000	For awareness
4	Training/Workshop of Staff	Manali WLS	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	Manali WLS	L/s	L/s	L/s	30000	
<b>Sub Total</b>						<b>230000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	Manali WLS	No.	300	7 person for 12 Months	25200	Mobile connectivity to field staff
<b>Sub Total</b>						<b>25200</b>	
<b>Nursery</b>							
<b>Upgrading/improvement of nursery</b>							
1	Raising of nursery plants, etc	Manali WLS	No.	L/s	1	200000	Development/ Improvement & raising of plants
<b>Sub Total</b>						<b>200000</b>	
<b>Infrastructure Development</b>							
<b>Maintenance of Roads/Paths/ water Pond /Camping Ground</b>							
1	Maint. Of staff qtr	Manali WLS	No	L/S	2	100000	
<b>Sub Total</b>						<b>100000</b>	
<b>Inspection/Bridle paths, etc.</b>							
1	Maint of I /path Titya to Upper Ruar	Bangduari	Km	L/s	7	140000	
2	Maint. Of I/path Gorudug to Lambadug	Monalgahar	Km	L/s	7	140000	
<b>Sub Total</b>						<b>280000</b>	
<b>TOTAL RECURRING</b>						<b>1742200</b>	
<b>TOTAL RECURRING &amp; NON- RECURRING</b>						<b>2182200</b>	
	Operational Charges					60000	
<b>GRAND TOTAL</b>						<b>2242200</b>	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR 2024-25 IN RESPECT OF "MANALI WILD LIFE SANCTUARY"							
Item of Work		Location	unit	Rate per Unit	Target		
					Phy	Fin	Justification
1	2	3	4	5	6	7	10
<b>A. Non Recurrent Activities</b>							
<b>Habitat Improvement</b>							
	<b>Enrichment Plantation</b>						
1	Barog braod Leaf plantation	Monalgahar	Hac	L/s	3	126000	habitat Improvement
<b>Sub Total</b>						<b>126000</b>	
<b>TOTAL NON RECURRING</b>						<b>126000</b>	
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	Manali WLS	M/days	1050 0	2 for 12 months	252000	To Control poaching in WLS
2	Fire watchers	Manali WLS	M/days	1050 0	2 for 6 months	126000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	Manali WLS	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint of fire lines	Manali WLS	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	Manali WLS	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
7	Augmentation of Saltlicks	Manali WLS	L/s	L/s	L/S	20000	For wild animals
8	Contingencies and Staff travelling expenses	Manali WLS	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff
9	Combing operation to search traps/nets etc.in the sanctuary	Manali WLS	L/s	L/s	L/S	30000	Combing operation
10	Rescue / transportaion of injured wild animals	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife

11	Providing of Khakhi jackets and Shoes to Staff	Manali WLS	L/s	L/s	L/S	100000	For staff
12	Providing of Search Lights	Manali WLS	L/s	L/s	L/S	30000	For patrolling
<b>Sub Total</b>						<b>868000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	Manali WLS	L/s	L/s	L/S	150000	
2	Publicity material / Signage	Manali WLS	L/s	L/s	L/S	30000	
3	Work Shop With people near PA	Manali WLS	L/s	L/s	L/S	30000	For awareness
4	Training/Workshop of Staff	Manali WLS	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	Manali WLS	L/s	L/s	L/s	30000	
<b>Sub Total</b>						<b>260000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	Manali WLS	No.	300	7 person for 12 Months	25200	Mobile connectivity to field staff
<b>Sub Total</b>						<b>25200</b>	
<b>Nursery</b>							
<b>Upgrading/improvement of nursery</b>							
1	Raising of nursery plants, etc	Manali WLS	No.	L/s	1	200000	Development/ Improvement & raising of plants
<b>Sub Total</b>						<b>200000</b>	
<b>Infrastructure Development</b>							
1	Watch & Ward , Carriage or transport of seized timber	Manali WLS	No.	L/S	L/S	50000	
						<b>50000</b>	
<b>TOTAL RECURRING</b>						<b>1403200</b>	
<b>TOTAL RECURRING &amp; NON- RECURRING</b>						<b>1529200</b>	
	Operational Charges					30000	
<b>GRAND TOTAL</b>						<b>1559200</b>	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR <b>2025-26</b> IN RESPECT OF " <b>MANALI WILD LIFE SANCTUARY</b> "							
Item of Work		Location	unit	Rate per Unit	Target		
					Phy	Fin	Justification
1	2	3	4	5	6	7	10
<b>A. Non Recurrent Activities</b>							
<b>Infrastructure Development</b>							
<b>Soil &amp; Moisture Conservation</b>							
<b>Check walls/ Breast walls/ Retaining wall</b>							
1	Check wall at CII Nala	Bangduari	No.	L/S	10	200000	To Control Soil Erosion
2	Check Dam at Shillathch	Monalgah ar	No.	L/S	10	200000	To Control Soil Erosion
<b>Sub Total</b>						<b>400000</b>	
<b>TOTAL NON RECURRING</b>						<b>400000</b>	
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigraziers	Manali WLS	M/days	10500	2 for 12 months	252000	To Control poaching in WLS
2	Fire watchers	Manali WLS	M/days	10500	2 for 6 months	126000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	Manali WLS	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint of fire lines	Manali WLS	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	Manali WLS	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
7	Augmentation of Saltlicks	Manali WLS	L/s	L/s	L/S	20000	For wild animals
8	Contingencies and Staff travelling expenses	Manali WLS	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff
9	Combing operation to search traps/nets etc.in the sanctuary	Manali WLS	L/s	L/s	L/S	30000	Combing operation
10	Rescue / transportation of injured wild animals	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife



11	Camping Equipments	Manali WLS	L/s	L/s	L/s	30000	for tents and etc for Patrolling
12	fire Tools	Manali WLS	L/s	L/s	L/s	30000	
<b>Sub Total</b>						<b>798000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	Manali WLS	L/s	L/s	L/S	150000	For awareness
2	Publicity material / Signage	Manali WLS	L/s	L/s	L/S	30000	For awareness
3	Work Shop With people near PA	Manali WLS	L/s	L/s	L/S	40000	For awareness
4	Training/Workshop of Staff	Manali WLS	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	Manali WLS	L/s	L/s	L/S	30000	For office
<b>Sub Total</b>						<b>270000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	Manali WLS	No.	300	7 person for 12 Months	25200	Mobile connectivity to field staff
<b>Sub Total</b>						<b>25200</b>	
<b>Nursery</b>							
	<b>Upgrading/improvement of nursery</b>						
1	Raising of nursery plants, etc.	Van Vihar	No.	L/s	1	200000	Development/Improvement & raising of plants
<b>Sub Total</b>						<b>200000</b>	
<b>Infrastructure Development</b>							
<b>Maintenance of Road and Building</b>							
1	Maint. Of I/path Kumsu To upper Ruar	Bangduari	Hac	L/s	6	120000	
<b>Sub Total</b>						<b>120000</b>	
<b>TOTAL RECURRING</b>						<b>1413200</b>	
<b>TOTAL RECURRING &amp; NON- RECURRING</b>						<b>1813200</b>	
	Operational Charges					30000	
<b>GRAND TOTAL</b>						<b>1843200</b>	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR 2026-27 IN RESPECT OF "MANALI WILD LIFE SANCTUARY"							
Item of Work			unit	Rate per Unit	Target		Justification
		Location			Phy	Fin	
1	2	3	4	5	6	7	10
<b>A. Non Recurrent Activities</b>							
<b>Infrastructure Development</b>							
<b>Construction of New building &amp; other structures</b>							
1	Const. Of sitting places along path	Manali WLS	No.	L/s	20	100000	For Visitor facility
<b>Sub Total</b>						<b>100000</b>	
<b>Soil &amp; Moisture Conservation</b>							
<b>Water Pond</b>							
1	Water Pond	Manali WLS	No.	30000	2	60000	To Control Soil Erosion
<b>Sub Total</b>						<b>60000</b>	
<b>Habitat Improvement</b>							
1	Pasture Improvement	Galliani	Hac	L/S	2	84000	Habitat improvement
2	Grafting/ Raising of fruit trees	Manali WLS	No.	L/s	L/s	10000	for Wildlife animal
<b>Sub Total</b>						<b>94000</b>	
<b>TOTAL NON RECURRING</b>						<b>254000</b>	
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	Manali WLS	M/days	10500	2 for 12 months	252000	To Control poaching in WLS
2	Fire watchers	Manali WLS	M/days	10500	2 for 6 months	126000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	Manali WLS	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint of fire lines	Manali WLS	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	Manali WLS	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
7	Augmentation of Saltlicks	Manali WLS	L/s	L/s	L/S	20000	For wild animals

8	Contingencies and Staff travelling expenses	Manali WLS	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff
9	Combing operation to search traps/nets etc.in the sanctuary	Manali WLS	L/s	L/s	L/S	30000	Combing operation
10	Rescue / transportation of injured wild animals	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
<b>Sub Total</b>						<b>738000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	Manali WLS	L/s	L/s	L/S	150000	For awareness
2	Publicity material / Signage	Manali WLS	L/s	L/s	L/S	30000	For awareness
3	Work Shop With people near PA	Manali WLS	L/s	L/s	L/S	40000	For awareness
4	Training/Workshop of Staff	Manali WLS	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	Manali WLS	L/s	L/s	L/S	30000	For office
<b>Sub Total</b>						<b>270000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	Manali WLS	No.	300	7 person for 12 Months	25200	Mobile connectivity to field staff
<b>Sub Total</b>						<b>25200</b>	
<b>Nursery</b>							
<b>Upgrading/improvement of nursery</b>							
1	Raising of nursery plants, etc.	Van Vihar	No.	L/s	1	200000	Development/ Improvement & raising of plants
<b>Sub Total</b>						<b>200000</b>	
<b>Infrastructure Development</b>							
<b>Maint of Building</b>							
1	Maint. Of P/Hut at Upper Ruar	Manali WLS	No	L/s	1	70000	For visitor
<b>Sub Total</b>						<b>70000</b>	
<b>TOTAL RECURRING</b>						<b>1303200</b>	
<b>TOTAL RECURRING &amp; NON-RECURRING</b>						<b>1557200</b>	
Operational Charges						40000	
<b>GRAND TOTAL</b>						<b>1597200</b>	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR 2027-28 IN RESPECT OF "MSANALI WILD LIFE SANCTUARY"							
Item of Work		Location	unit	Rate per Unit	Target		Justification
					Phy	Fin	
1	2	3	4	5	6	7	10
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	Manali WLS	M/days	10500	2 for 12 months	252000	To Control poaching in WLS
2	Fire watchers	Manali WLS	M/days	10500	2 for 6 months	126000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	Manali WLS	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint of fire lines	Manali WLS	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	Manali WLS	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
7	Augmentation of Saltlicks	Manali WLS	L/s	L/s	L/S	20000	For wild animals
8	Contingencies and Staff travelling expenses	Manali WLS	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff
9	Combing operation to search traps/nets etc.in the sanctuary	Manali WLS	L/s	L/s	L/S	30000	Combing operation
10	Rescue / transportation of injured wild animals	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
11	Hiring of motor vehicle/ POL & maintenace charges	Manali WLS	L/s	L/s	L/S	25000	To meet with the running cost of official vehicle attached with DFO & staff and hiring of vehicle
12	Camping Equipments	Manali WLS	L/s	L/s	L/s	30000	Outer for tents and etc for Patrolling
<b>Sub Total</b>						<b>793000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	Manali WLS	L/s	L/s	L/S	150000	For awareness

2	Publicity material / Signage	Manali WLS	L/s	L/s	L/S	30000	For awareness
3	Work Shop With people near PA	Manali WLS	L/s	L/s	L/S	40000	For awareness
4	Training/Workshop of Staff	Manali WLS	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	Manali WLS	L/s	L/s	L/S	30000	For office
<b>Sub Total</b>						<b>270000</b>	
<b>Communication</b>							
1	Communication and connectivity to field staff	Manali WLS	No.	300	7 person for 12 Months	25200	Mobile connectivity to field staff
<b>Sub Total</b>						<b>25200</b>	
<b>Nursery</b>							
<b>Upgrading/improvement of nursery</b>							
1	Raising of nursery plants, etc.	Van Vihar Nry	No.	L/s	1	200000	Development/ Improvement & raising of plants
<b>Sub Total</b>						<b>200000</b>	
<b>Infrastructure Development</b>							
<b>Maintenance of Buildings</b>							
1	Maint. of Qtr at Manali	Manali WLS	No	L/s	1	50000	
2	Repair of P/Hut At lambadug	Monalg ahr	No	L/s	L/s	80000	
3	Repair Of camping Ground at Ptauti	Bangdu ari	No	L/s	3	15000	
						<b>145000</b>	
<b>TOTAL RECURRING</b>						<b>1433200</b>	
<b>Operational Charges</b>						40000	
<b>GRAND TOTAL</b>						<b>1473200</b>	

ANNUAL PLAN OF OPERATION OF PROTECTED AREA FOR THE YEAR 2028-29 IN RESPECT OF "MANALI WILD LIFE SANCTUARY"							
Item of Work		Location	unit	Rate per Unit	Target		Justification
					Phy	Fin	
1	2	3	4	5	6	7	10
<b>B. Recurrent Activities</b>							
<b>Wildlife Protection and Conservation Activities</b>							
<b>Protection</b>							
1	Deployment of Antipoachers and Antigrazers	Manali WLS	M/day s	10500	2 for 12 months	252000	To Control poaching in WLS
2	Fire watchers	Manali WLS	M/day s	10500	2 for 6 months	126000	To Control Fire in WLS
3	Group Patrolling for search operation Etc.	Manali WLS	L/s	L/s	L/S	70000	For Protection of WLS
4	Maint of fire lines	Manali WLS	L/s	L/s	L/S	50000	For Control Fire
5	General survey of flora/ fauna	Manali WLS	L/s	L/s	L/S	50000	For survey of flora and fauna of Manali WLS
6	Provision of rewards to the informers/ Helpers	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
7	Augmentation of Saltlicks	Manali WLS	L/s	L/s	L/S	20000	For wild animals
8	Contingencies and Staff travelling expenses	Manali WLS	L/s	L/s	L/S	100000	To meet with the Traveling expanses of staff
9	Combing operation to search traps/nets etc.in the sanctuary	Manali WLS	L/s	L/s	L/S	30000	Combing operation
10	Rescue / transportation of injured wild animals	Manali WLS	L/s	L/s	L/S	20000	For better protection of wildlife
11	Hiring of motor vehicle/ POL & maintenance charges	Manali WLS	L/s	L/s	L/S	25000	To meet with the running cost of official vehicle attached with DFO & staff and hiring of vehicle
12	Camping Equipments	Manali WLS	L/s	L/s	L/s	30000	Outer for tents and etc for Patrolling
<b>Sub Total</b>						<b>793000</b>	
<b>Education and Awareness Generation</b>							
1	Wildlife week and other awareness programme	Manali WLS	L/s	L/s	L/S	150000	For awareness
2	Publicity material / Signage	Manali WLS	L/s	L/s	L/S	30000	For awareness

3	Work Shop With people near PA	Manali WLS	L/s	L/s	L/S	40000	For awareness
4	Training/Workshop of Staff	Manali WLS	L/s	L/s	L/S	20000	For awareness & training on wild life techniques
5	Office expenses	Manali WLS	L/s	L/s	L/S	30000	For office
Sub Total						270000	
Communication							
1	Communication and connectivity to field staff	Manali WLS	No.	300	7 person for 12 Months	25200	Mobile connectivity to field staff
Sub Total						25200	
Nursery							
	Upgrading/improvement of nursery						
1	Raising of nursery plants, etc.	Van Vihar Nry	No.	L/s	1	200000	Development/ Improvement & raising of plants
Sub Total						200000	
TOTAL RECURRING						1288200	
	Operational Charges					40000	
GRAND TOTAL						1328200	

<b>Year wise and Component wise Abstract of APOs in respect of Manali WLS</b>											
<b>Component/ Year</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>	<b>2022-23</b>	<b>2023-24</b>	<b>2024-25</b>	<b>2025-26</b>	<b>2026-27</b>	<b>2027-28</b>	<b>2028-29</b>	<b>Total</b>
<b>A. Non Recurrent Activities</b>											
<b>Infrastructure Development</b>											
<b>Construction of New building &amp; other structures</b>	100000	75000	75000	0	0	0	0	100000	0	0	<b>350000</b>
<b>Soil &amp; Moisture Conservation</b>	1020000	400000	120000	400000	440000	0	400000	60000	0	0	<b>2840000</b>
<b>Community Development through Participation</b>	160000	0	0	0	0	0	0	0	0	0	<b>160000</b>
<b>Habitat Improvement</b>	0	0	0	0	0	126000	0	94000	0	0	<b>220000</b>
<b>TOTAL NON RECURRING</b>	<b>1280000</b>	<b>475000</b>	<b>195000</b>	<b>400000</b>	<b>440000</b>	<b>126000</b>	<b>400000</b>	<b>254000</b>	<b>0</b>	<b>0</b>	<b>3570000</b>
<b>B. Recurrent Activities</b>											
<b>Wildlife Protection and Conservation Activities</b>	663100	3644000	709000	838000	907000	868000	798000	738000	793000	793000	<b>10751100</b>
<b>Education and Awareness Generation</b>	655000	270000	360000	250000	230000	260000	270000	270000	270000	270000	<b>3105000</b>
<b>Communication</b>	32400	25200	25200	25200	25200	25200	25200	25200	25200	25200	<b>259200</b>
<b>Nursery</b>	250000	150000	150000	200000	200000	200000	200000	200000	200000	200000	<b>1950000</b>
<b>Infrastructure Development</b>	0		40000	0	100000	50000	120000	70000	145000	0	
<b>Inspection/ Bridle Path</b>	217800	410000	380000	0	280000	0	0	0	0	0	<b>1287800</b>
<b>Camping Ground</b>	0	0	80000	0	0	0	0	0	0	0	
<b>TOTAL RECURRING</b>	<b>1818300</b>	<b>4499200</b>	<b>1744200</b>	<b>1313200</b>	<b>1742200</b>	<b>1403200</b>	<b>1413200</b>	<b>1303200</b>	<b>1433200</b>	<b>1288200</b>	<b>17958100</b>
<b>TOTAL RECURRING &amp; NON- RECURRING</b>	<b>3098300</b>	<b>4974200</b>	<b>1939200</b>	<b>1713200</b>	<b>2182200</b>	<b>1529200</b>	<b>1813200</b>	<b>1557200</b>	<b>1433200</b>	<b>1288200</b>	<b>21528100</b>
<b>Operational Charges</b>	25000	40000	50700	50700	60000	30000	30000	40000	40000	40000	<b>406400</b>
<b>GRAND TOTAL</b>	<b>3123300</b>	<b>5014200</b>	<b>1989900</b>	<b>1763900</b>	<b>2242200</b>	<b>1559200</b>	<b>1843200</b>	<b>1597200</b>	<b>1473200</b>	<b>1328200</b>	<b>21934500</b>



## Annexure - XII

### Name of Plantations as it stood on 31.3.2019 in WLS Manali

SN	Beat	Year of Plantation	Name Of Scheme	Name of Plantation Area	Area in Ha.	Remarks
1	5	6	7	8	9	10
1 Year Old	Monalgahar	2016-17	Afforestation(CAMPA)	New Plantation2/6 Barog CIV (Monalgahar)	5	
-do-	Bangdwari	2016-17	Pasture Improvement (CAMPA)	Kumsu thach (2/5 Bangdwari)	4	
Two Year Old	Monalgahar	2015-16	2406-Plan 102 (04) Forestry -& WL improvement Tree cover	2/6 Monalgahar Tehera	3	
4 year Old	Moanlgahar	2015-16	2406 Plan 102(04) Enrichment Planting	2/6 Monalgahar Shillathach	5	
7 Year Old	Nil	2010-11	Nil	Nil	Nil	No plantation

## Annexure - XIII

### List of Forest Nurseries in Manali WLS

Name of Nursery	Beat	Area (ha)	Type	
Van Vihar Manali	Van Vihar Manali	0.30	Permanent	

### Annexure - XIV

#### Religious place around Manali Wild life Sanctuary

Sr. No.	Near Manali WLS
1	Hadimba Temple
2	Manu Rishi Temple

### Annexure - XV

#### List of water Resources in Manali Wild life Sanctuary

Sr.No.	Monalgarh Beat	Sr.No.	Bangduari Beat
1	Tikkan Tal Nala	1	Reokan Nala
2	Khanpari Nala	2	Gori Devi Ra Nala
3	Galiani Nala	3	Kho Nala
4	Main Nala Manalsu Khad	4	Shakauka Nala
5	Water pond near Lambadugh	5	Chho Nala (Ptauti Nala)

### Annexure - XVI

#### List of Fire line in Manali Wild life Sanctuary

Name of Beat			Name of Beat		
Sr. No.	Monalgarh	Distance	Sr. No.	Bangduari	Distance
1	Gorudug to Lambadug	4 km.	1	Kharma to Gulamlung	6 km.
			2	Gulamlung to Upperruad	5 km

**Plate :1      Conifer Forests of Manali WLS**





**Plate:2      Broad leaved forests of Monalgahar Beat**



**Plate: 3      Fauna of Manali WL Sanctuary**



Himalayan Black Bear (*Ursus thibetinus*)



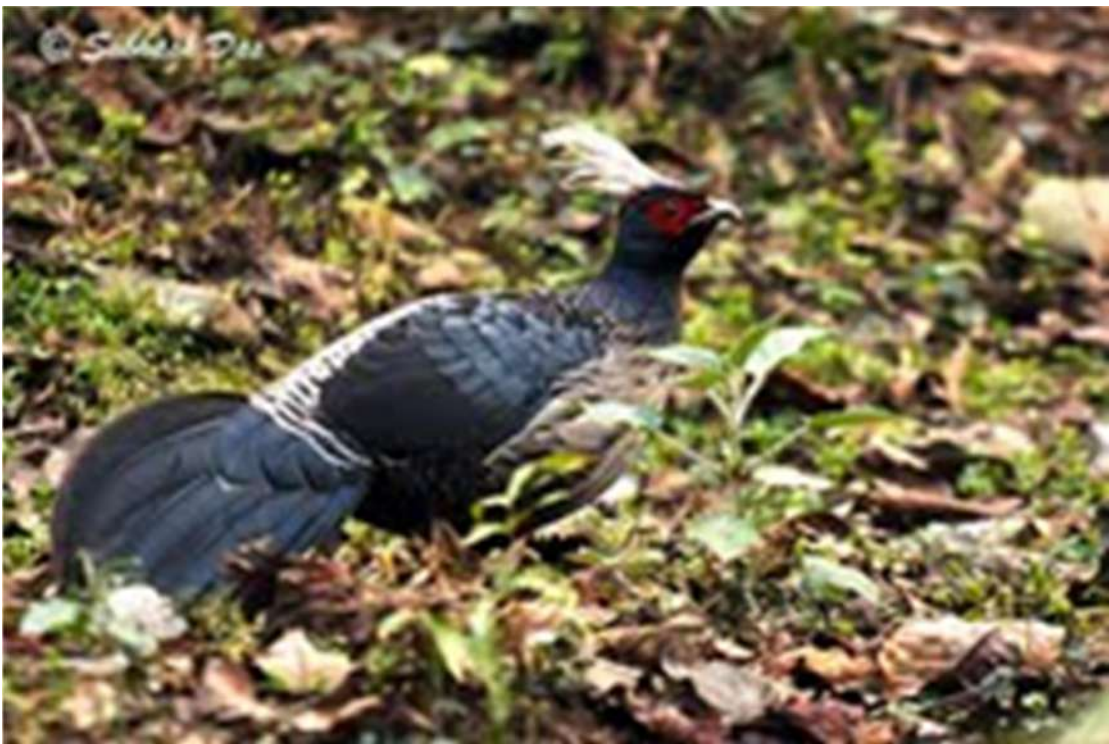
Musk Deer (*Moschus moschiferus*)



**Plate :4      Pheasant of Manali WL Sanctuary**



Himalayan Monal (*Lophophorus impejanus*)



Kalij Pheasant (*Lophura leucomelanos*)

**Plate :5      Medicinal Plants Found in Manali WLS**



Nagchhatri (*Trillidium govanianum*)



Mushtanda (*Fritillaria roylei*)



Bankakri (*Podophyllum hexandrum*)



Bhojpatra (*Betula Utilis*)



Gulabi Buransh (*Rhododendron campanulatum*)



**Plate :6**

**Wild Flowers Found in Manali WLS**





**Plate :7      Group Patrolling**



Gulamlang, Bangdwari



Silha thach and Lambadug, Monalgahar



A view from Patrolling Hut Upper Ruar