सत्यमेव जयते

Department of Wildlife Protection J&K Government

The Management Plan
of
Ramnagar Wildlife Sanctuary

Period
(2020-21 to 2029-30)

By:

Anil Kumar Atri, SFS

Wildlife Warden

Jammu

Prepared by:

Wildlife Division Jammu

Boulevard Road, Near Lalit Grand Palace, Srinagar – 190001 Tel/Fax No: 0194-2501069 (May-October).
Manda - Hills (Near Ashoka Hotel) Jammu – 180005, Tele/Fax: 0191-2572570 (November-April)
Website: www.jkwildlife.com
Email: jkwildlife78@gmail.com
jkwildlife72@gmail.com

GOVERNMENT OF JAMMU & KASHMIR
OFFICE OF THE PR. CHIEF CONSERVATOR OF FORESTS (WILDLIFE)/ CHIEF WILDLIFE WARDEN

Subject: Approval of Management Plan for Ramnagar Wildlife Sanctuary.

Whereas; the Draft Management Plan of Ramnagar Wildlife Sanctuary has been prepared by Wildlife Warden, Jammu.

Whereas; the draft of said management Plan has undergone various reviews at different levels and suggestions and objections made by the participants were incorporated.

Whereas; the committee constituted vide this office order No: 13 of 2020 dated 08.01.2020 held its meetings on 21.08.2020, 28.11.2020, 13.02.2021, 29.05.2021 & 29.10.2021 to discuss the Draft Management Plan for Ramnagar Wildlife Sanctuary.

Whereas; the above said committee recommended for approval of Management Plan of Ramnagar Wildlife Sanctuary for a period 2020-21 till 2029-30 in the final meeting held on 29.10.2021 subject to the incorporation of suggested points in the meeting.

Whereas; the Regional Wildlife Warden, Jammu vide his No: RWLWJ/2021-22/6251-52 dated 30.03.2022 has submitted that the suggested points in the final meeting of committee have been incorporated in Management Plan of Ramnagar Wildlife Sanctuary and accordingly recommended for its approval.

Therefore, under the authority vested under Sections 33 of Wildlife Protection Act, 1972 the undersigned accords approval to the Management Plan for Ramnagar Wildlife Sanctuary for the period 2020-21 till 2029-30, subject to the condition that all activities as per the prescriptions in the Management Plan shall be undertaken within provision of Wildlife Protection Act, 1972 and orders of the Hon'ble Supreme Court/ High Court of J&K issued from time to time.

(Suresh Kr. Gupta) IFS
Pr. Chief Conservator of Forests/
Chief Wildlife Warden
Jammu & Kashmir

No: WLP/Res/2021-22/427-30 dated: 31-03-2022.

Copy to the:

01. Commissioner/ Secretary to Government, Forest Ecology & Environment Department, Civil Secretariat, J&K, Jammu for kind information.
02. Regional Wildlife Warden, Jammu.
03. Wildlife Warden, Jammu Division.
04. Pvt. Secretary to Pr. Chief Conservator of Forests &HoFF, J&K for kind information of PCCF/HoFF.

सत्यमेव जयते

Suresh Kr. Gupta, IFS
Pr. Chief Conservator of Forests (Wildlife)/
Chief Wildlife Warden
Jammu & Kashmir

Foreword

The Ramnagar Wildlife Sanctuary was notified by the J&K Government vide SRO 136 dated 10th April, 1990. The Wildlife Sanctuary is being managed by Wildlife Protection Department, since its notification. In order to ensure the management of Ramnagar Wildlife Sanctuary on scientific basis, the present management plan is a serious effort with the application of latest concepts of management and technology. This management plan shall serve an authentic scientific baseline data for future management of wildlife in the area.

This management plan has been prepared keeping in view the guidelines laid down by Sh. W.B. Swarkar. The comprehensive analysis of various issues in the management plan along with detailed prescription covering all the management aspects shall guide in preparation of Annual Plan of Operations under various schemes. The implementation as per prescriptions shall further guide the department for future planning, conservation and management of the sanctuary.

I complement Dr. Kumar MK, IFS, Regional Wildlife Warden, Jammu, Mr. Anil Kumar Atri, SFS, Wildlife Warden, Jammu and his team for timely completing the exercise for preparation of this Management Plan.

(Suresh Kumar Gupta) IFS

PREFACE

The Ramnagar Wildlife Sanctuary is located in district Jammu at a distance of 3 Kms from Jammu General bus stand. The **sanctuary is** located on the northern fringe of Jammu city and is a small green patch of forest which is valued as the only green lung of the city. Sanctuary comprises of all three types of vegetation i,e Conifer, Broadleaved, and Scrub. The Jammu – Srinagar National highway passes through the sanctuary. The area comprises of demarcated forest and is roughly wedge shaped. The Sanctuary is located between **32° 44' 37' to 32' 47' 32" North and 74 50' 45" to 74° 53' 37'' East longitude and latitude.** It falls in district Jammu, of Jammu Province in the Union Territory of Jammu & Kashmir. The Sanctuary is covered by **G.T sheet Nos. 43L/13 and 43L/14** and exhibits the altitudinal range of 263 to 559 meters above mean sea level.

The Maharaja of the earstwhile state established the area on a Private Rakh under the Game Preservation Act 1942 and named it after the Ramnagar ridge, to ensure the availability of shooting for his favourite pastime. The Maharaja had enforced strict game laws for this area. These laws covered all areas (Game reserve or Rakhs) where hunting was permitted seasonally and in controlled manner. Some game guards were deputed to police and patrol the reserved areas and penalty for poaching was severe.

The Ramnagar Wildlife Sanctuary was notified as Wildlife Sanctuary by the J&K Government vide **Order No. FST/20 of 1981 dated 4th of Feb. 1981** and **SRO No. 136 dated 10/04/1990**. The Sanctuary comprises of compartments 1/R, 2/R,3/R and 4/R of Ramnagar Block and Co.1/P, 2/P and 3/P of Paloura block of Ramnagar Range of Jammu Forest Division and covers an area of 31.5 Sq. kms as per notification.

The present management plan of Ramnagar Wildlife Sanctuary is the first ever plan for planning wildlife management. Non-availability of adequate authentic scientific baseline data and lack of documentation has been a major constraint in preparation of this management plan. The strategies developed are quite comprehensive with a scope for improvement as the knowledge base and facilities widen.

The management plan is developed for a period of ten years so that necessary changes can be incorporated based on acquired knowledge after research/ studies as well as experience gained as a result of implementing the present management plan. The management plan in the present form will be a big leap towards achieving set goals and objectives and will generate a system which will allow further planning and management of Ramnagar Wildlife Sanctuary.

The exercise for compilation of this plan involved a lot of teamwork. I am highly indebted to Sh. Suresh K. Gupta, IFS, Principal Chief Conservator of Forests, Chief Wildlife Warden, J&K Govt. for providing all expedient guidance and directions during the preparation of this Management Plan.

I am gratified to the Addl. Principal Chief Conservators of Forests, Eco-tourism J&K Sh. J. Frankoi, IFS for his valuable support and guidance.

I am also gratified to the Chief Conservator of Forests, Eco-tourism J&K Miss. Shally Ranjan, IFS for her valuable support and guidance.

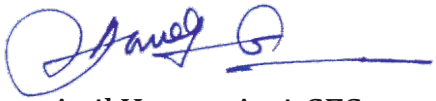
I admiringly acknowledge the valuable technical guidance provided by Dr. Kumar M.K, IFS Regional Wildlife Warden, Jammu during the entire process of compilation and finalization of the present plan.

I take this opportunity to place on record my heartfelt gratitude towards Dr. Neeraj Sharma, Senior Assistant Professor Institute of Mountain Environment, University of Jammu, Bhaderwah Campus, J&K for sparing his valuable time and help in enlisting flora and fauna of the Sanctuary.

My sincere thanks to Mr. Majid Farooq, Administrative Officer/Scientist Coordinator/PI (Climate Change Center/ENVIS/ISRO, Projects) Department of Ecology, Environment and Remote Sensing, for his contribution in preparation of maps that are essential for the Management Plan. My Special thanks to Sh. Kuldeep Mehta (Survey Officer, PI Division) for his valuable inputs for preparation of maps.

I duly acknowledge the inputs from field, particularly by Dr. Ranjeet Katoch VAS, Manda Rescue Centre, Sh. Roshan Lal, Range Forest Officer, Ramnagar Wildlife Sanctuary and Sh Noor-ul-Amin Range officer Manda Deer Park and Rescue Centre Jammu and also from other field staff including the Foresters, Guards and other field staff, who greatly helped in prioritizing the strategies in the management plan. I also thank my office staff for their help in preparing the management plan.

My sincere thanks also due to all the Committee members', officers of various departments whose ideas and suggestions in one form or another have helped in framing some of the strategies of this plan.



Anil Kumar Atri, SFS
Wildlife Warden
Jammu

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2020-21 to 2029-30

EXECUTIVE SUMMARY

The legend goes that while hunting in the foothills of the Shivaliks near the picturesque Tawi river, Raja Jambulochan witnessed a leopard and a goat drinking water together from the same pond. Fascinated by this, the king decided to build a city at this site, where the strong and weak may live together in peace and mutual tolerance. Historians believe that Raja Jambulochan founded the city, now known as Jammu, in 14th century BC. Today, the city of Jammu is popularly known as the "City of Temples".

The Ramnagar Wildlife Sanctuary, located in close vicinity of Jammu town, is named after the Ramnagar ridge of Manda hills. The sanctuary was earlier established as a Rakh' by the Maharaja of the state for game hunting.

The Ramnagar Wildlife Sanctuary is spread over a total area of 30.50 Square Kilometers. The flora and fauna represent rich biological significance of this Sanctuary. The vegetation of the sanctuary comes under the major group "Sub tropical Northern Mixed Dry Deciduous Forests". A wide variety of sub-tropical broad leaved tree and shrubs are found in the area. Large area of the sanctuary is covered with shrubs and weeds where as some pure patches of bamboo are also found at places. The broad-leaved forest consists of deciduous species.

The Sanctuary hosts a wide variety of fauna and avifauna typical to the area of sub-tropical climate. Important flora reported from the Ramnagar Wildlife Sanctuary are Khair *(Acacia catechu)*, Sirris *(Albizzia lebbeck)*, Phalai *(Acacia modesta)*, Brankud or Bhainkar *(Adhatoda vasica)*, Garnna *(Carissa opaca)*, Bel *(Agele marmelos)*, Simul *(Bombax ceiba)*, Bamboo *(Dendrocalamus strictus)*, Talli or Shisham *(Dalbergia sissoo)*, Pipal *(Ficus religiosa)*, Bargad *(Ficus bengalensis)*, Amaltas *(Cassia fistula)*, Palas *(Butea monosperma)*, Mango *(Mangifera indica)*, Kambal *(Lannea grandis)*, Amla *(Emblica officinalis)*, Kachnar *(Bauhinia variegata)*, Ber *(Zizyphus jujuba),* Cyntha *(Dodonaea viscosa)*, *Phyllanthus emblica, Mallotus philippensis, Bauhinia vahlii*, Parijat *(Nyctanthes arbortristis), Tinospora cordifolia, Holharrhena antidysenterica, Lantana camara, Woodfordia fruticosa, Coolbrookia oppositifolia, Calotropis procera* etc. *Euphorbia royleana* is also found on rocky areas. Solitary Chir Pine *(Pius roxburghii)* trees are also found in the area at top alleviations of the area.

Important mammalian fauna reported from the Ramnagar Wildlife Sanctuary are Nilgai *(Boselaphus tragocamelus)*, Barking deer *(Muntiacus muntjak)*, Rhesus monkey *(Macaca mulatta)*, Jackal *(Canis aureus)*, Hare *(Lepus nigricollis)*, Porcupine *(Hystrix indica)*, Wild boar *(Sus scrofa)*, Small Indian Civet Cat *(Viverricula indica)*, Jungle Cat *(Felis chaus)*, Mongoose *(Herpestes edwardsii)*, Pea fowl *(Pavo cristatus)*, Red Jungle fowl *(Gallus gallus)*, Bush Quail *(Prediculata asiatica)*, Green Pigeon *(Treron phoenicoptera)*, Blue Rock Pigeon *(Columba livia)*, Red Turtle Dove *(Streptopelia tranquebarica)*, Spotted Owlet *(Athene brama)*, Parakeets *(Psittacula cyanocephala)*, Slender billed vulture *(Gyps tenuirostris)*, White

backed vulture *(Gyps bengalensis)*, Hoopoe *(Upupa epops)*, Bulbul *(Pycnonotus spp.)*, Pariah kite *(Milvus migranis)*, Koel *(Eudynamys scolopacea)*, Wood pecker, Babblers *(Turdoides caudatus)*, *different kites and eagles* etc. Cobra, Python, Viper, Common Krait, Water Snake, Rat Snake, Wolf Snake, Trinket Snake, Cat Snake, Keelback, Monitor lizard include some of the reptilian species reported from the sanctuary.

The sanctuary is under severe threat due to burgeoning pressure due to the expansion and urbanisation of Jammu town and is considered as the only green lung of the Jammu city left unharmed, to some extent, due to its protected area status.

At present major conservation and management issues in the sanctuary are:

1. Interspersion of human habitation around the sanctuary and resultant degradation of wildlife habitat largely owing to livestock grazing and fuel wood collection in several areas.
2. Crop depredation by wild ungulates, monkeys resulting in wild animal-people conflicts.
3. The inadequacy of interpretation and visitor facilities, lack of people's participation in the management of sanctuary.
4. Inadequate baseline data crucial for further evaluation and monitoring.
5. Inadequacy of trained field staff
6. Threat of encroachment due to land hunger and prime location of the sanctuary.
7. The major problems sanctuary management faces which adversely affects the achievement of these objectives include encroachments, inadequate staff, lack of basic infrastructural facilities and dense human settlements around sanctuary. Despite the richness of the natural beauty, the facilities for eco-tourism are grossly inadequate. The efforts of education and awareness generation have been less than adequate.

In order to conserve this unique ecosystem of sub-Himalayan biodiversity and its various components in the long run several management objectives have been put forth.

Some major objectives of management are:

- ✔ To conserve and protect the habitat, restore the physical integrity of the area in addition to restoring the degraded portion of the sanctuary so that endangered and endemic flora and fauna inhabiting the area are adequately protected and propagated along with their habitats.
- ✔ To mitigate man-animal conflict and to create awareness among the people in general and the children in particular about nature and wildlife with particular emphasis on the ecological role of the sanctuary area.
- ✔ To promote Eco-tourism for conservation, awareness, education and scientific exploration without affecting the sensitive ecosystem adversely.
- ✔ To reduce the dependence of the people on forest-based resources in the zone of influence, with sensitivity to cultural and economic well-being of the communities, through eco-development activities.
- ✔ To improve capacity building of staff and local communities for efficient management of the sanctuary through better training and infrastructure.
- ✔ To promote scientific and ecological studies that will help the sanctuary management in assessing the physical and biological resources, planning for conservation of these resources and monitoring the health of the habitat.
- ✔ To protect most of the catchment areas of all the tributary nallas originating within and

around the Wildlife Sanctuary,

- To minimize conflict between local people and wildlife and maintain a harmony between man and nature.
- To secure the boundary of the sanctuary against encroachment.

Conservation Strategies

To meet the conservation and management objectives several long term and short term strategies, have been suggested.

The present management plan has been compiled following the manual for planning wildlife management in protected areas and managed forests by Wildlife Institute of India.

It comprises of three parts; Part One dealing with four chapters: Chapter 1- Introduction to the area, Chapter 2- Background information & attributes, Chapter 3- History of management & present practices and Chapter 4- The Protected Area & the interface Land use situation. Part Two deals with the rest of the eight Chapters namely: Chapter 5- Vision, Objectives and problems in achieving the objectives, Chapter 6- The Strategies, Chapter 7- Human- Animal Conflicts, Chapter 8 - Rescue Centre Manda and Veterinary care, Chapter 9 - Eco-Tourism, interpretation and Conservation Education, Chapter 10 - Eco-development, Chapter 11 - Research, Monitoring & Training, Chapter 12 - Organization and Administration and Chapter 13 - The Budget. Part three comprises of various Annexures and control forms pertaining to the management of the sanctuary.

In Chapter 6 (The Strategies), the sanctuary has been divided into Zones namely, Inviolate zone and Eco-restoration zone and strategies have been identified for these zones. Theme plans have been developed for the sanctuary area for protection from poaching, fire protection, soil and moisture conservation and water management, animal health surveillance, man-animal coexistence and Awareness.

The Chapters 7, 8,9 & 10 that deal with Human Animal Conflicts, Rescue centre Manda and veterinary care, Tourism Interpretation and Conservation Education, Eco-development respectively, have proposed various measures for conducting these activities. Chapter-11 deals with the Research, Monitoring & Training be required for effective management of the sanctuary. Chapter-12 deals with Organization and Administration that would be required for fulfilling these objectives. Chapter-12 deals with the Budget.

Major activities suggested during the plan period 2020-21 to 2029-30 for Ramnagar Wildlife Sanctuary can be enumerated as below:

1. Restore biomass production on degraded pastures, alleviate grazing pressure on crunch wildlife habitats and reduce local people's dependency on livestock through promotion of alternate livelihoods like honey keeping, organic farming, touist guides etc.
2. Take up soil and moisture conservation measures in the prioritized catchments. Promote fuel wood plantation around villages and promote alternate source of energy. Discourage diversion of water and alteration of natural state of streams, surface waters, springs etc.
3. Promote construction of predator proof corrals around the periphery of the sanctuary and encourage better herding and animal husbandry practices such as day-time guarding and

veterinary care.

4. Initiate special measures for awareness and education of identified target groups viz.,student groups, youth groups, PRI members, women groups and for their involvement in the conservation and management of natural resources in the sanctuary.
5. Strengthen the system of 'Informers' in different localities and develop a system of getting feedback from the trekkers and volunteers who traverse through the sanctuary. Promote local stewardship of wildlife through awareness raising, capacity building and recruitment of local villagers as Wildlife Stewards / Guardians".
6. Organize training programme for the field staff in habitat assessment, identification of important species of flora and fauna and developing inter-personal skills. Organize exposure visits for the staff to well managed protected areas in the country.
7. Take up reorganization and creation of proposed positions with the Government of Jammu &Kashmir and initiate construction of sanctuary monitoring quarters. Procure other infra-structure and prepare a proposal for setting up of wireless network / walky-talky to revamp protection
8. Effective Boundary Management by way of demarcation, installation of boundary pillars and appropriate fencing of gap areas.
9. Review the boundary alignment to include key habitats of threatened species based on up to date distribution and abundance data and secure protection of vital corridors for wildlife dispersion/migration.
10. Review policies concerning compensation paid for wildlife depredation with the view of simplifying and including compensation packages for livestock losses.
11. Arrange a brainstorming session for prioritizing research and monitoring activities in the Ramnagar Wildlife Sanctuary involving key research institutions in the state as well as within country.

Sd/-
Anil Kumar Atri, SFS
Wildlife Warden
Jammu

Part - I

The Protected Area:

The Existing Situation

CHAPTER-1
INTRODUCTION OF THE AREA

1.1 Name, Location, Constitution and Extent:

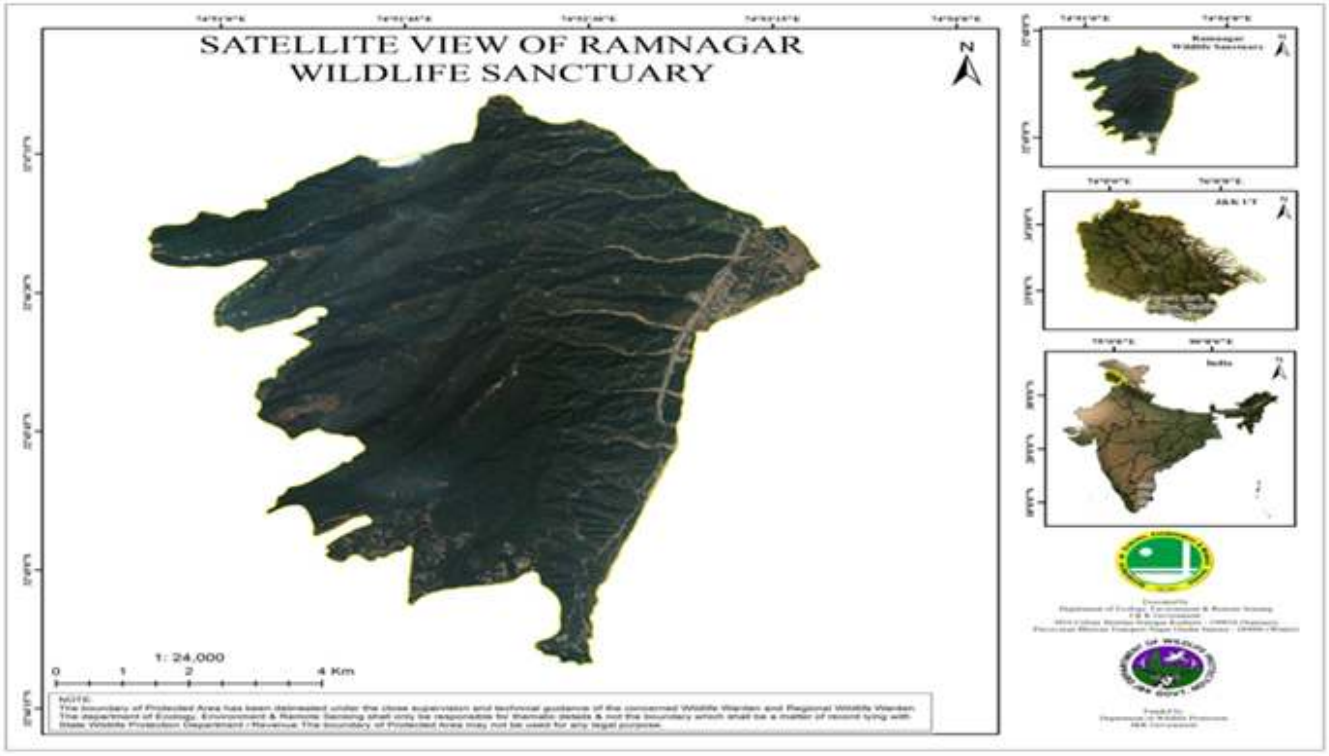
Ramnagar Wildlife Sanctuary is located on the northern fringe of Jammu city of UT of Jammu and Kashmir. It is a small green patch of forest which is valued as the green lung of the city. Sanctuary is comprising of all three types of vegetations i.e., Conifer, Broad leaved and Scrub. The Jammu-Srinagar National highway passes through the sanctuary. Most of the area comprises of demarcated forest and is roughly wedge shaped. The area is surrounded by habitations of Jammu city and adjoining villages and faces heavy biotic pressure. This wildlife protected area is a repository of rich assemblage of floral and faunal biodiversity. The biomass resources of the sanctuary are partially shared by the native agro-pastoral communities residing along the periphery of the sanctuary. Jammu is one of the two major cities of UT of Jammu and Kashmir and is also the winter capital of the UT. Most of the area where the present city stands used to be under thick forest cover until recent past. Burgeoning human population and development has led to exponential expansion of the city. This expansion is coupled with anthropogenic pressure, changes in land use pattern has affected the forest cover of the sanctuary and adjoining areas.

The Ramnagar Wildlife Sanctuary is located between **32° 44' 37' to 32' 47' 32" North latitude and 74 50' 45" to 74° 53' 37" East longitude** and is about 03 kms away from General Bus stand Jammu. It falls in district Jammu of Union Territory of Jammu & Kashmir. The Sanctuary is covered by **G.T Sheet Nos. 43L/13 and 43L/14** and exhibits the altitudinal range of 263m to 559m above mean sea level.

The Ramnagar Wildlife Sanctuary was notified as Wildlife Sanctuary by the J&K Govt. vide Govt order No. **FST/20 of 1981 dated 4th of Feb. 1981** and Government **SRO No. 136 Dated 10/04/1990**. The Sanctuary consists of compartments which are 1/R, 2/R,3/R and 4/R of Ramnagar Block and Co.1/P, 2/P and 3/P of Paloura block of Ramnagar Range of Jammu Forest Division and covers an area of 31.5 Sq. kms as per the notification.

According to a recent floral study of Ramnagar Wildlife Sanctuary, it houses more than 258 species of plants including herbs, shrubs, climbers and trees. A comparative study of phyto-diversity shows that this small patch of forest is much more diverse and richer than surrounding forest areas of Jammu. Faunal species, some of which include Leopard, Barking Deer, Wild Boar, Nilgai, Porcupine, Red Jungle Fowl, Peafowl, Python, Russell Viper, Cobra, Palm Civet Cat, Jungle Cat, Mongoose, Monitor lizard, etc owe their existence and protection in this patch of protected area.

Keeping in view the expansion of Jammu city and increasing pressure on the natural resources, large threat looms over the remaining residual forest patches around this wildlife protected area. At the same time considering the interests of stake holders and thickly populated Jammu city, Ramnagar Wildlife Sanctuary's sustainable use and protection of its natural resources has to be given due consideration on top priority.



1.2 Access and Approach:

The Ramnagar Wildlife Sanctuary is located on the outskirts of Jammu city along the NH-44.The sanctuary is just 3 kms away from the General Bus Stand of Jammu city. The nearest Airport from the Ramnagar Wildlife Sanctuary is Jammu Airport and is 08 kms away and the nearest railhead is 6 kms away. The National Highway NH-44(Jammu-Srinagar) passes through the sanctuary. There are no internal roads inside the sanctuary except the National highway mentioned above which divides it into two parts and one link road along the southern boundary of the sanctuary. Only walkways are there for the movement of staff and visitors inside this sanctuary. Most of the sanctuary area is surrounded by habitations which are connected through roads out-side the sanctuary boundary.

1.3 Statement of Significance:

1.3.1 Historical Significance: The Maharaja of the erstwhile state established the area on a Private Rakh under the Game Preservation Act 1942 and named it after the Ramnagar ridge of Manda hills, to ensure the availability of shooting for his favorite pastime. The Maharaja has enforced strict game laws over the area. These laws covered all areas (game reserves/rakhs) where hunting was permitted seasonally and in controlled manner. Some game guards were deputed to police and patrol the reserved area and penalty for poaching was very severe. Ramnagar Wildlife Sanctuary was notified as protected area (Wildlife Sanctuary) by the J&K Government vide SRO 136 dated 10/04/1990. For protection and control of wildlife in the erstwhile state of J&K rules and regulation were passed in the form of Jammu & Kashmir Games Preservation Act 1998 (1942 A.D), Act No. XXIV of 1998. Thereafter, with a view to protect and preserve the wildlife of the Jammu & Kashmir Wildlife Protection Act 1978 was passed by the State legislator. Till the 30st Oct 2019 the wildlife protection activities were

guided under this Act. After the Jammu & Kashmir Re-Organization Act 2019 the Indian Wildlife Act 1972 got its implementation in the UT of Jammu and Kashmir.

1.3.2 Ecological Significance: Ramnagar Wildlife Sanctuary is influenced by the South-West monsoon, hence, supports Sub-tropical Pine Forest mixed with Sub-tropical northern mixed dry deciduous forests (Type 5B/C2) of the group 9 (including Type 9/C1-Himalyan sub-tropical forests) of the Champion and Seth classification.

Flora and fauna of this sanctuary represent rich biological significance of this Sanctuary. The vegetation of the sanctuary comes under the major group 'Sub-tropical northern mixed dry deciduous' forest. A wide variety of sub-tropical broad-leaved trees and shrubs are found in the area. Some open patches of the sanctuary are covered with shrubs and weeds. Mixed patches of bamboo are also found at few places. Broad-leaved forest mostly consists of deciduous species.

The area hosts a wide variety of fauna and avifauna typical to the area of Sub-tropical climate. Important flora reported from the Ramnagar Wildlife Sanctuary are Khair *(Acacia catechu)*, Sirris *(Albizzia lebbeck)*, Phalai *(Acacia modesta)*, Brankud or Bhainkar *(Adhatoda vasica)*, Garnna *(Carissa opaca)*, Bel *(Agele marmelos)*, Simul *(Bombax ceiba)*, Bamboo *(Dendrocalamus strictus)*, Talli or Shisham *(Dalbergia sissoo)*, Pipal *(Ficus religiosa)*, Bargad *(Ficus bengalensis)*, Amaltas *(Cassia fistula)*, Palas *(Butea monosperma)*, Mango *(Mangifera indica)*, Kambal *(Lannea grandis)*, Amla *(Emblica officinalis)*, Kachnar *(Bauhinia variegata)*, Ber *(Zizyphus jujuba),* Cyntha *(Dodonaea viscosa), Phyllanthus emblica, Mallotus philippensis, Bauhinia vahlii*, Parijat *(Nyctanthes arbortristis), Tinospora cordifolia, Holharrhena antidysenterica, Lantana camara, Woodfordia fruticosa, Coolbrookia oppositifolia, Calotropis procera* etc. *Euphorbia royleana* is also found on rocky areas. Solitary Chir Pine *(Pius roxburghii)* trees are also found in the area at top alleviations of the area.

Important fauna/avifauna reported from the Ramnagar Wildlife Sanctuary are Nilgai *(Boselaphus tragocamelus)*, Barking deer *(Muntiacus muntejak)*, Rhesus monkey *(Macaca mulatta)*, Jackal *(Canis aureus)*, Hare *(Lepus nigricollis)*, Porcupine *(Hystrix indica)*, Wild boar *(Sus scrofa)*, Small Indian Civet Cat *(Viverricula indica)*, Jungle Cats *(Felis chaus)*, Mongoose *(Herpestes edwardsii)*, Pea fowl *(Pavo cristatus)*, Red Jungle fowl *(Gallus gallus)*, Bush Quail *(Prediculata asiatica)*, Green Pigeon *(Treron phoenicoptera)*, Blue Rock Pigeon *(Columba livia)*, Red Turtle Dove *(Streptopelia tranquebarica)*, Spotted Owlet *(Athene brama)*, Parakeets *(Psittacula cyanocephala)*, Slender billed vulture *(Gyps tenuirostris)*, White backed vulture *(Gyps bengalensis)*, Hoopoe *(Upupa epops)*, Bulbul *(Pycnonotus spp.)*, Pariah kite *(Milvus migranis)*, Koel *(Eudynamys scolopacea)*, Wood pecker, Babblers *(Turdoides caudatus), different kites and eagles* etc. Cobra, Python, Viper, Common Krait, Water Snake, Rat Snake, Wolf Snake, Trinket Snake, Cat Snake, Keelback, Monitor lizard include some of the reptilian species reported from the sanctuary.

1.4 Values of the Sanctuary:

1.4.1 Biodiversity Values:

- Rich floral biodiversity.
- Exceptional diversity of birds.

- Significant population of reptiles.
- Significant population of insects especially butterflies.

1.4.2 Education and Research Values:

- Research values associated with biodiversity, Eco-system services, Human-Wildlife interaction, Natural regeneration assessment and Eco- restoration.
- High potential for nature education and nature exploration.
- Values related to bird watching, trekking, etc.
- Values related to nature interpretation.
- Values related to aesthetic sensibility.
- As natural sink for rescued wild animals especially reptiles and birds.

CHAPTER-2
BACKGROUND INFORMATION AND ATTRIBUTES

2.1 Boundaries:

2.1.1 External Boundaries: The Ramnagar Wildlife Sanctuary lies in the lower Shivalik Range of the Himalayan Mountains. The nearest city, Jammu is also the district head quarter and winter capital of the UT of Jammu and Kashmir.

As per the notification issued by the Department of Forests, Govt. of Jammu and Kashmir, the external boundaries of sanctuary are as below:

North	**:**	**Keran wali Rakh**
East	**:**	**River Tawi and Khanpur village**
South	**:**	**Jammu city**
West	**:**	**Settlements of Janipura and Shangan.**

The Northern boundary of Ramnagar Wildlife Sanctuary (as per notification) is shared by Keranwali Rakh, Chinore, Thather village, Ban-talab area of Jammu city, whereas the North-Eastern boundary of Ramnagar Wildlife Sanctuary is shared by the area of Jambu Zoo, IIT-Jammu, Jagti and Khanpur JDA colony. On the Western and southern sides there is Jammu City and on the Eastern side the River Tawi and Sidhra area demarcate the boundary of Ramnagar Wildlife Sanctuary.

Status of External Boundaries:

Boundaries of Ramnagar Wildlife Sanctuary are demarcated. In the West and South of the sanctuary is Jammu city (constructed area) and is protected by way of brick walls and chain link fencing. Northern boundary of the sanctuary is shared by KeranWalli Rakh which is a forest area continuous with Sanctuary Forest. Towards the east the boundary of the sanctuary is shared with Khanpur and Jagti private habitations where proper demarcation and appropriate fencing is required. Towards the south of the sanctuary is River Tawi where demarcation is done by way of installation of boundary pillars. Portion of the Sanctuary which is still with the Forest Department partially falls in compartments number Co. 1/P & 3/R and complete compartment numbers Co. 2/P, Co. 3/P.

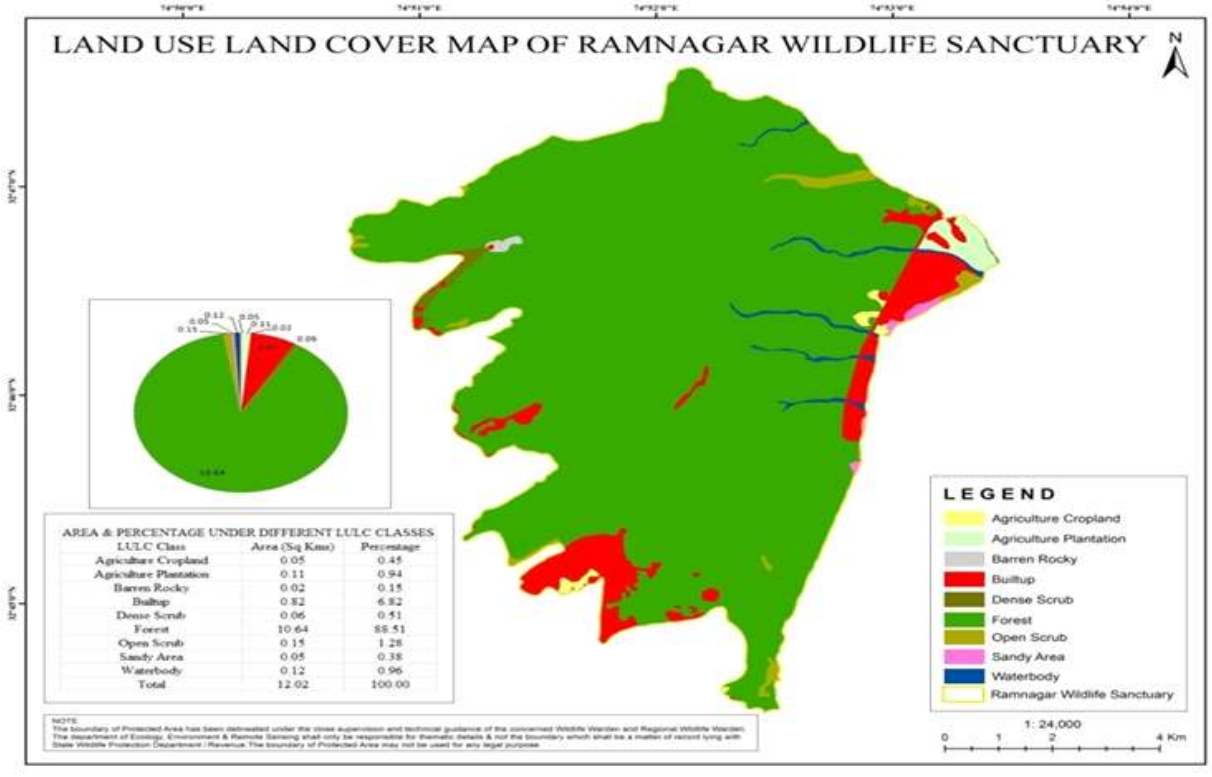
2.1.2 Internal Boundaries: From the administrative point of view, Ramnagar Wildlife Sanctuary is administered by Range Officer Jammu. Sanctuary is further divided into blocks and beats. There are three Blocks viz. Manda Block, Paloura block & Sitlian Block which are being looked after by Block officer. Sanctuary is further divided into 5 Beats namely Manda Beat, Paloura Beat, Janipur beat, Dhauntly Beat and Sitilian Beat which are being looked after by Beat guard. The whole sanctuary is divided into compartments which are numbered as compartment 1/R, 2/R, 3/R, 4/R,1/P, 2/P and 3/P. Compartments 2/P, 3/P and some portion of Co.1/P and 3/R is with the Territorial Forest Division Jammu which is required to be taken over and managed at par with other portion of the sanctuary.

Table 2.1 Compartment detail of Ramnagar Wildlife Sanctuary

Block	Beats	Compartments	Area as per GIS.
Manda	Manda	Co. 1/R	220.98 ha
	Janipur	Co. 4/R	100.54 ha
Setlian	Dhounatly	Co. 2/R	117.14 ha
	Setlian	Co. 3/R	303.3 ha
Paloura	Paloura	Co.1/P	128.56 ha
		Co.2/P	133.7 ha
		Co. 3/P	197.73 ha
Total area			1201.95 Ha

Total Area of the Sanctuary(as per notification) = 3150 Ha.
Total Area of the Sanctuary as per GIS calculation = 1214.95 Ha.
Area under Compartments = 1201.95 Ha.
Area outside Compartments = 13 Ha.

As per the notified boundary of the sanctuary, there are few private structures/infrastructure and agriculture fields falling inside the sanctuary. Also, there are few Government/religious installations like Army installations, different Govt. department structures and religious structures inside the boundary of the protected area, which are existing prior to the notification of the area as wildlife sanctuary. Details of such structures along with area is enclosed as annexure.



2.2 Eco-sensitive Zone:

The Eco-Sensitive Zone of Ramnagar Wildlife Sanctuary was notified by the Ministry of Environment, Forests and Climate Change New Delhi vide Notification No: S.O 2128(E) dated: 01.06.2021.

The Eco-sensitive zone shall be to an extent of 0.00 m to 1.85 Km around the boundary of Ramnagar Wildlife Sanctuary. The extents of the Eco-Sensitive Zone from the boundary of Ramnagar Wildlife Sanctuary varies from 1.85 km in the North, 0.75 km in the North-east, 0.00 km in the South, 0.00 km in the South-west, 0.00 km in the West, 1.794 km in the Northwest, 1.296 km in the East and 1.472 km in the Southeast.

The total area of the Eco-Sensitive Zone is 10.73 Sq.kms which includes some portion of river Tawi and some portion of forests of Sidhra on the eastern side and in the north and north-west direction it includes forests of Keran Rakh.

Boundary Description of Eco-Sensitive Zone area of Ramnagar WLS

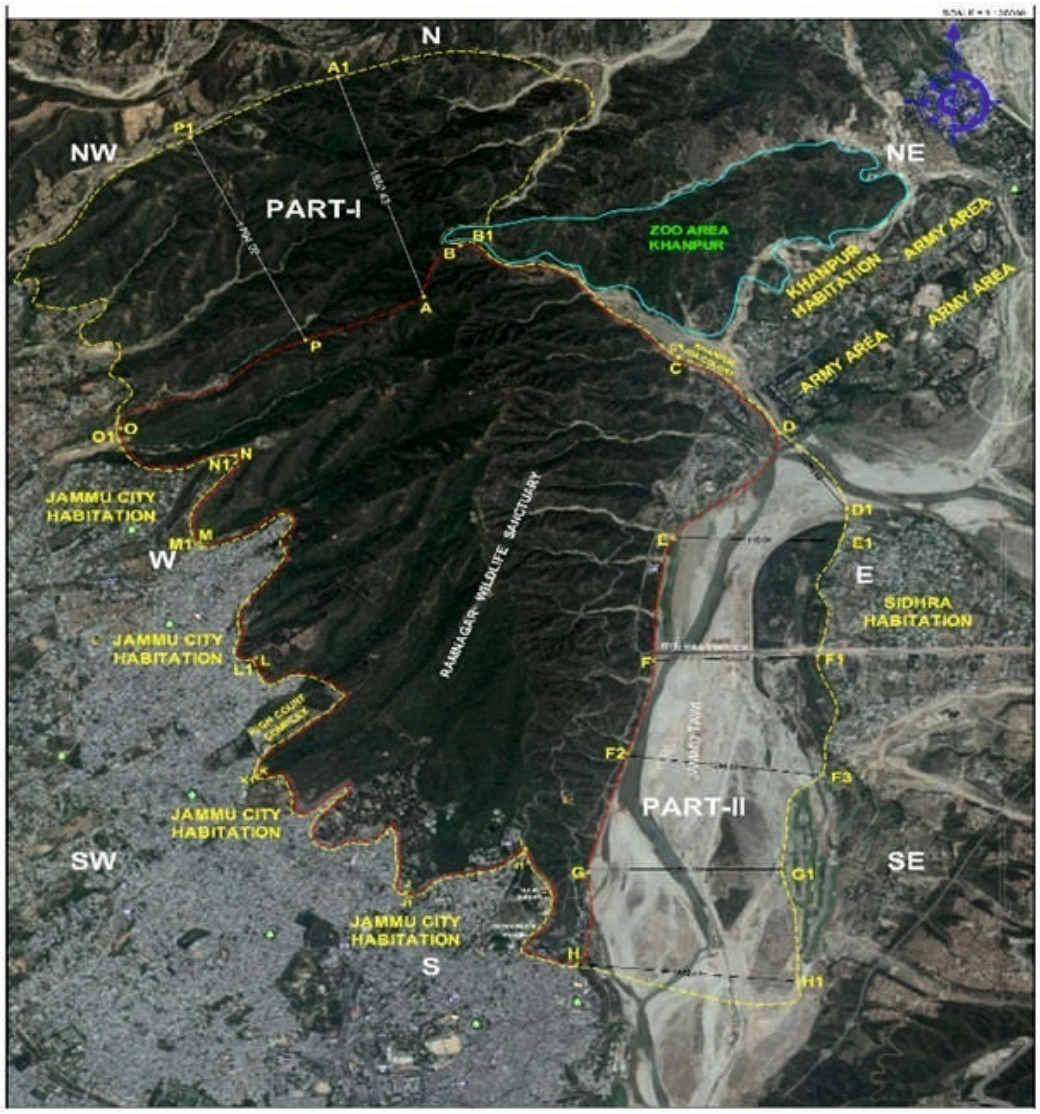


Table 2.2 Boundary Description of Eco-Sensitive Zone area of Ramnagar WLS

S. No.	Direction w.r. t. boundaries of the sanctuary	Point	Geo-Coordinates		Remarks
			Latitude	Longitude	
1	North	A1	N 32^0 48' 11.67''	E 74^0 51' 32.70''	Area surrounded by Thather village KeranRakh, Chinore
		B1	N 32^0 47' 31.15''	E 74^0 52' 5.77''	
2	North East	C1	N 32^0 47' 1.98''	E 74^0 52' 56.89''	Area surrounded by Khanpur JDA colony Jagti & Nagrota.
		D1	N 32^0 46' 17.93''	E 74^0 53' 42.28''	
3	East	E1	N 32^0 46' 10.35''	E 74^0 53' 38.43''	River Tawi & Sidhra village.
		F1	N 32^0 45' 44.30	E 74^0 53' 33.91''	
4	South East	G1	N 32^0 44' 56.49''	E 74^0 53' 22.24''	River Tawi & Jammu city Municipal area.
		H1	N 32^0 44' 13.64''	E 74^0 53' 23.97''	
5	South	I1	N 32^0 45' 00.22''	E 74^0 52' 16.13''	Jammu city Municipal area.
		J1	N 32^0 44' 50.42''	E 74^0 51' 47.08''	
6	South West	K1	N 32^0 45' 20.06''	E 74^0 51' 13.26''	--do--
		L1	N 32^0 45' 48.74''	E 74^0 51' 10.85''	
7	West	M1	N 32^0 46' 19.70''	E 74^0 51' 04.73''	--do--
		N1	N 32^0 48' 41.94''	E 74^0 51' 16.41''	
8	North West	O1	N 32^0 46' 45.79''	E 74^0 50' 42.80''	Jammu city Municipal area & Keran habitation.
		P1	N 32^0 47' 56.10''	E 74^0 50' 55.93''	

2.3 Legal Status:

The Maharaja of the State established the area on a Private Rakh under the Game Preservation Act 1942 and named it after the Ramnagar ridge. To ensure availability of shooting for his favorite pastime, the Maharaja has enforced strict game laws. These laws covered all areas i.e. game reserve or rakhs where hunting was permitted seasonally and in controlled manner.

Some game guards were deputed to police and patrol the reserved area and penalty for poaching was very severe. The Ramnagar Wildlife Sanctuary was notified as Wildlife Sanctuary by the J&K Govt.vide Govt order No. **FST/20 of 1981 dated 4th of Feb. 1981** and Government **SRO 136 dated 10/04/1990**. The Sanctuary covers an area of **31.5 Sq. kms** as per the SRO. The area comprises of demarcated forest and is roughly wedge shaped.

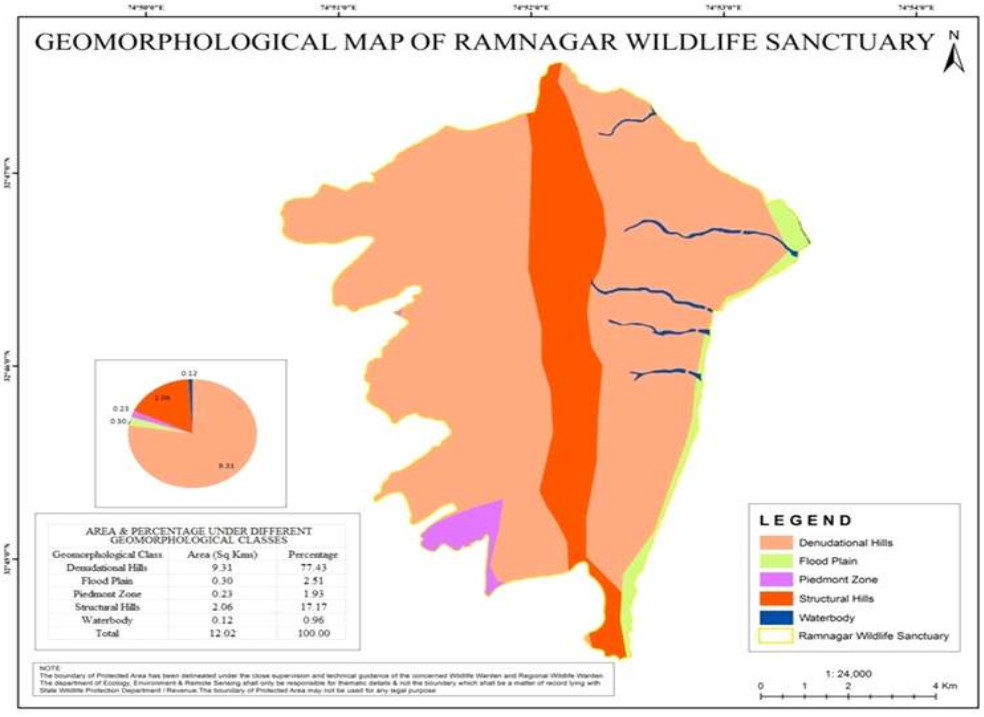
For protection and control of wildlife in the erstwhile state of J&K rules and regulation were passed in the form of the Jammu & Kashmir Games Preservation Act 1998 (1942 A.D), Act No. XXIV of 1998. Thereafter, with a view to protect and preserve the wildlife, the Jammu & Kashmir Wildlife

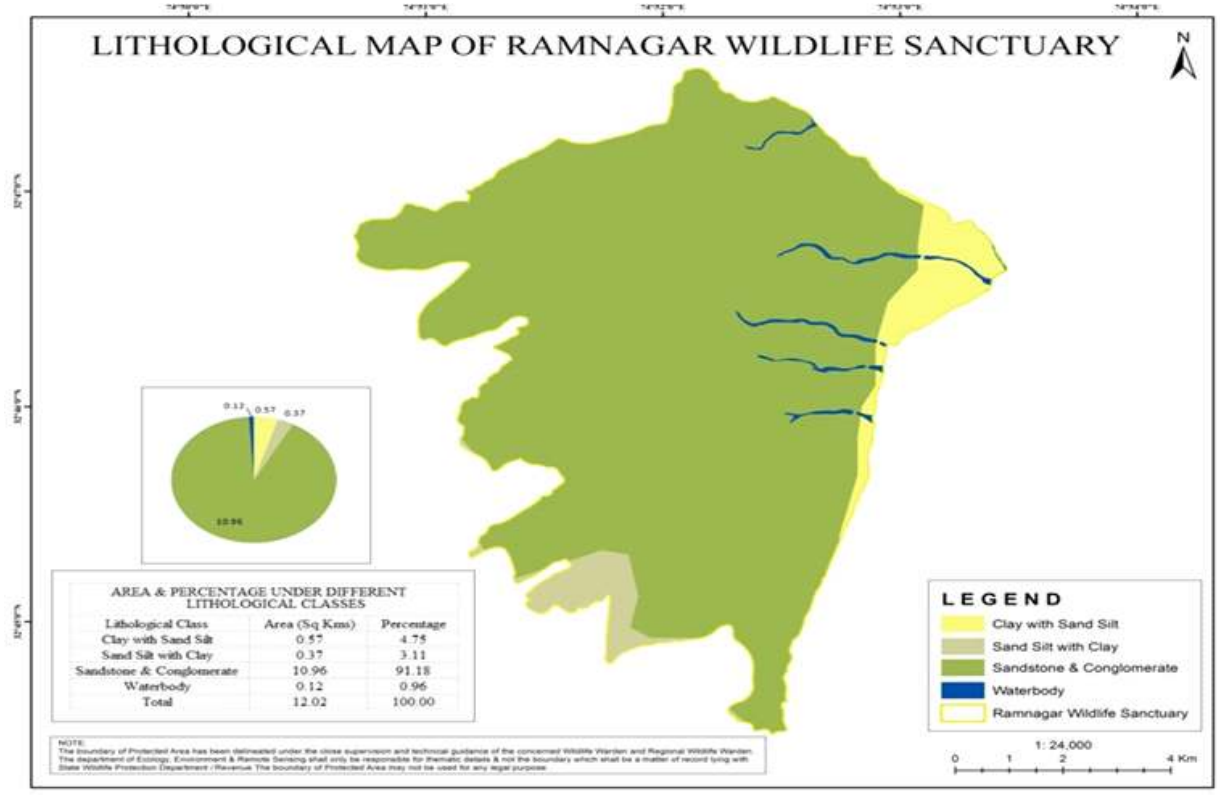
Protection Act 1978 was passed by the State legislator. Till the 30st Oct 2019 the wildlife protection activities were guided under this Act. After the Jammu & Kashmir Re-Organization Act 2019 the Wildlife Protection Act 1972 got its implementation in the UT of Jammu and Kashmir.

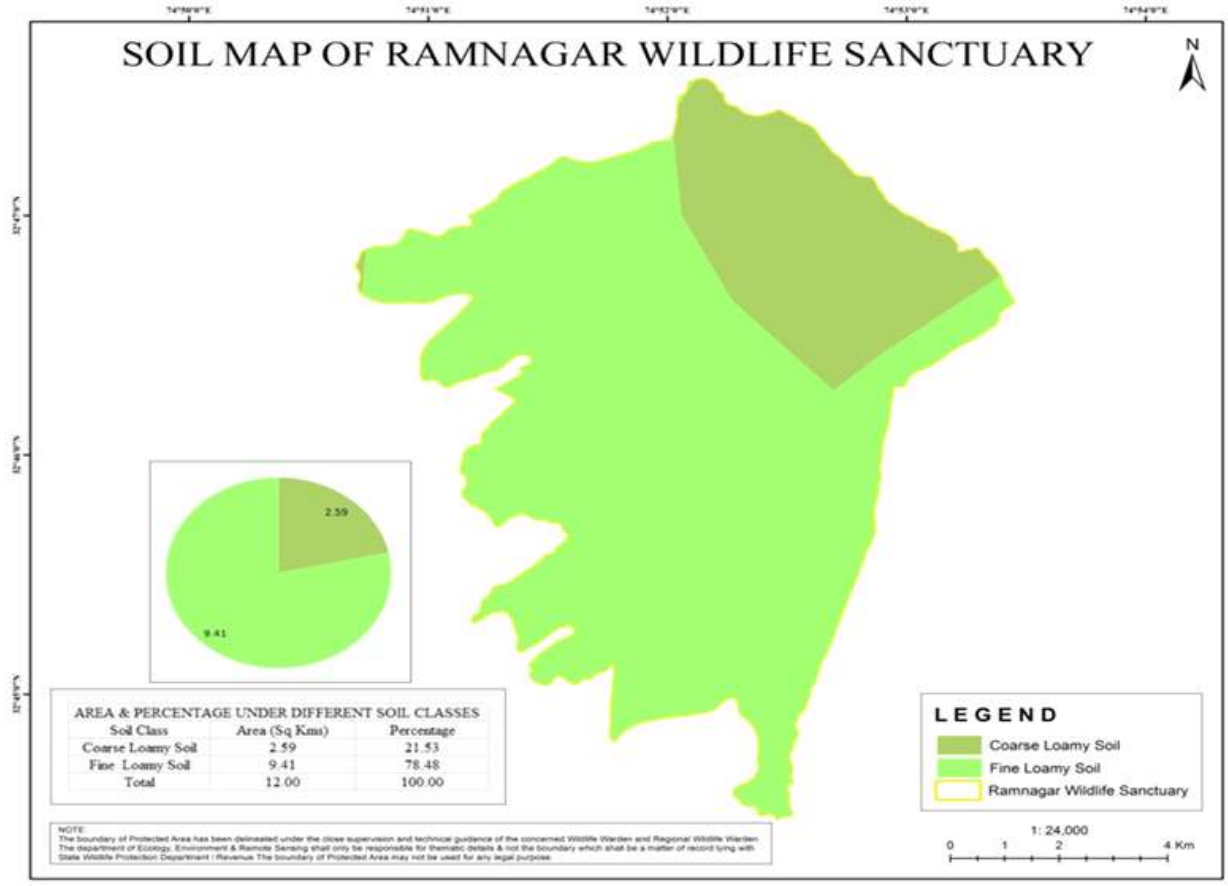
The area is surrounded by Jammu City (Municipal area) and many villages/small habitations and faces heavy biotic pressure. Biomass resources of the sanctuary are partially shared by the native agro-pastoral communities, nomadic tribes and migratory labourers residing along the periphery of the sanctuary.

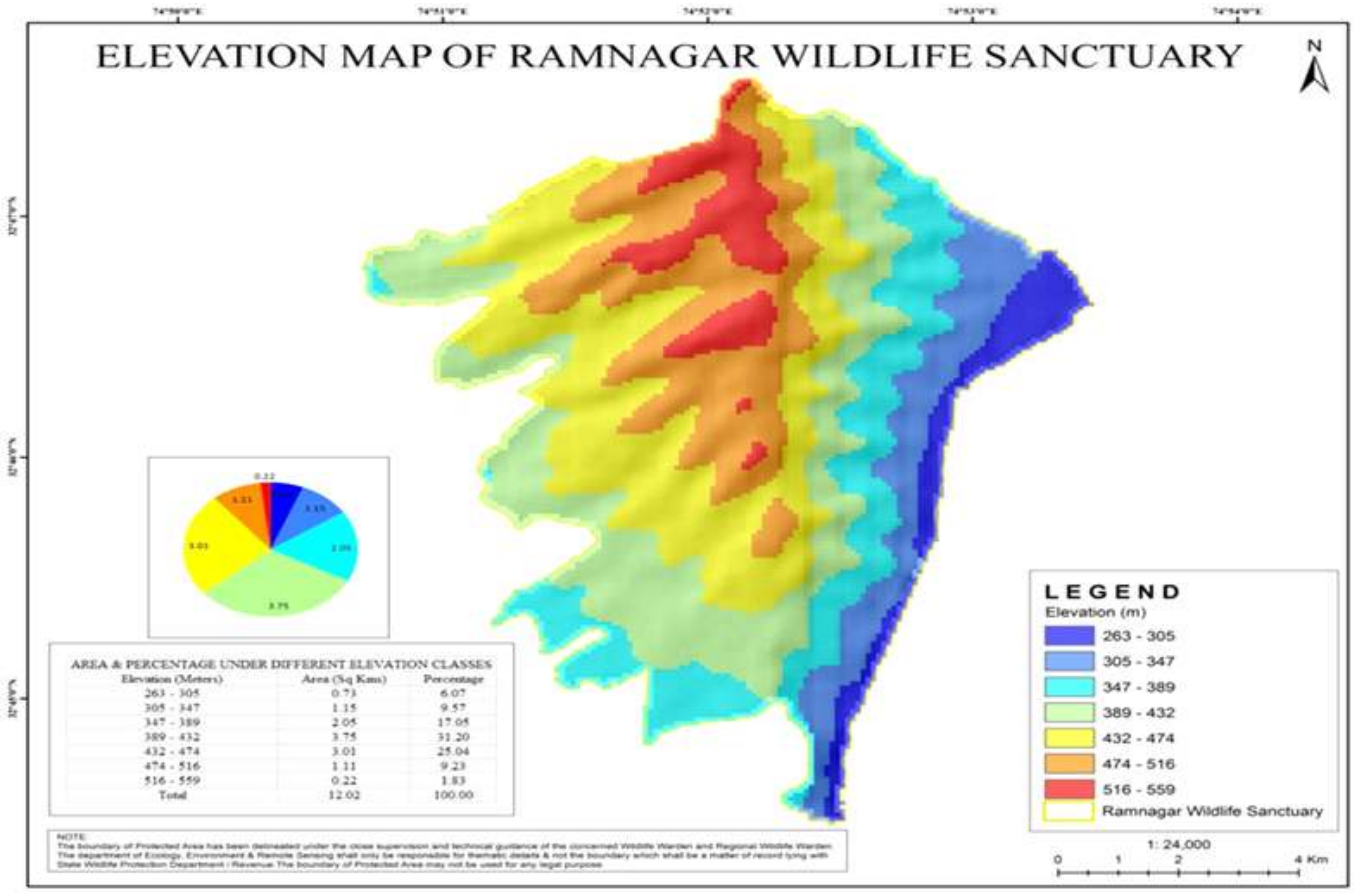
2.4 Geology, Rock and Soil:

The main rock type in and around the area is mixture of boulders and pebbles of various sizes. The soil is primary in nature and comprises of shallow immature soils. The texture is sandy and loam. Two types of soils viz; mountainous soil and loamy soil are found in the area. Mountainous soil is brown in colour. The soil reaction is slightly acidic to neutral and texture in general varies from loam to sandy loam except in low valley areas of Jammu where heavy textured soil is found. The Ramnagar Wildlife Sanctuary falls in sub-mountainous region at the foot hills of the Himalayas. Shivalik Range rises gradually in the north part of the district and merges with the lndo-Gangetic plains in the south. The Northern hill areas of the Jammu, where the sanctuary falls, the terrain is rugged with strike valleys and dissected ridge slopes. The altitude of the area varies roughly between 263m and 559m above mean sea level. Major physiographic slope is towards the south-western directions i.e towards the outer plane area. Hill nallahs are seasonal and flash floods occurred immediately after the rains are recoded. The southern outer plains of the Jammu are located at the foot hills of the outer most Shivaliks and an altitude varying between 280 to 400 m above mean sea level. Innumerable seasonal nallahs traverse the sanctuary. These nallahs are broad and shallow having water only for short time after the rain. Water level is deep, resulting into very less number of ground water sources are found in and around the sanctuary.




LITHOLOGICAL MAP OF RAMNAGAR WILDLIFE SANCTUARY
N
0.12
0.57
0.37
10.96
AREA & PERCENTAGE UNDER DIFFERENT LITHOLOGICAL CLASSES
Lithological Class | Area (Sq Kms) | Percentage
Clay with Sand Silt | 0.57 | 4.75
Sand Silt with Clay | 0.37 | 3.11
Sandstone & Conglomerate | 10.96 | 91.18
Waterbody | 0.12 | 0.96
Total | 12.02 | 100.00
LEGEND
Clay with Sand Silt
Sand Silt with Clay
Sandstone & Conglomerate
Waterbody
Ramnagar Wildlife Sanctuary
1: 24,000
0 1 2 4 Km


SOIL MAP OF RAMNAGAR WILDLIFE SANCTUARY
N
2.59
9.41
AREA & PERCENTAGE UNDER DIFFERENT SOIL CLASSES
Soil Class | Area (Sq Kms) | Percentage
Coarse Loamy Soil | 2.59 | 21.53
Fine Loamy Soil | 9.41 | 78.48
Total | 12.00 | 100.00
LEGEND
Coarse Loamy Soil
Fine Loamy Soil
Ramnagar Wildlife Sanctuary
1: 24,000
0 1 2 4 Km



2.5 Terrain:

Topography of the area is hilly with moderate to steep slopes and has an elevation varying from 263 meters to 559 meters from the mean sea level (MSL). Area is traversed by many ridges, the main ridge being the Ramnagar ridge running from south to the north of the sanctuary. The Eastern and western side of the sanctuary has many nallahs running into Tawi River. Area has many khads, the prominent being Kerr, Khanpur and Janipur khads which are rainfed and remain dry for most of the time. Flash floods are reported during rainy season only.

2.6 Climate:

The region experiences very hot summer and moderate winters. The temperature varies from 4°C during winters to 46°C during summers. January is the coldest month, though the temperature never touches the zero degree. Winter of the tract is quite cold because of the winds flowing from the adjoining snow bound mountains. The area receives bulk of precipitation during the monsoon from mid June to mid September and also experiences winter rains. The average annual rainfall is about 1050 to 1100 mm. The climate of Jammu like rest of North-Western India features a humid subtropical climate, characterized by three well defined seasons viz summer, winter and monsoon. Summer sets in from the month of April upto the month of June being the hottest month of the year. Winter season starts from November and continues till March with January being the coldest month. Monsoon lasts from ending June to mid September. Winters are also wet as rains are there due to western disturbances.

2.6.1 Temperature:

Table 2.3 Temperature recorded around the Ramnagar Wildlife Sanctuary in last four years.

Month	2017		2018		2019		2020	
	Min ºC	Max ºC	Min ºC	Max ºC	Min ºC	Max ºC	Min ºC	Max ºC
January	6.8	17.6	3.9	19.1	5.2	17.4	6.4	16.6
February	8.6	22.5	7.4	22.6	8.1	19.3	8.0	21.7
March	10.4	26.3	11.9	28.5	10.6	24.4	12.1	24.0
April	16.0	34.4	16.5	33.6	17.1	33.5	16.7	31.2
May	20.4	37.8	20.5	38.3	20.0	37.7	20.3	36.2
June	23.6	37.3	25.8	38.1	24.1	40.5	24.5	36.9
July	25.1	37.5	26.3	34.5	26.3	34.7	26.0	35.6
August	25.0	33.7	25.9	34.0	25.9	33.7	25.7	33.2
September	22.7	33.9	22.9	32.2	24.6	33.0	24.6	34.4
October	16.3	32.8	13.3	29.4	17.2	29.4	15.2	32.2
November	8.9	25.1	10.1	25.6	13.0	24.0	9.2	24.4
December	6.2	21.1	4.4	20.3	7.2	16.2	6.0	18.8

Source: -SKAUST Jammu.

2.6.2 Rainfall pattern and distribution:

Table 2.4 Rainfall recorded around the Ramnagar Wildlife Sanctuary

Month	2017		2018		2019		2020	
	Rainfall (mm)	Days	Rainfall (mm)	Days	Rainfall (mm)	Days	Rainfall (mm)	Days
January	143.8	6	9.6	0	64.2	11	81.6	6
February	31.4	5	50.8	4	155.4	16	29.2	9
March	40.4	5	12.6	7	36.2	14	135.6	7
April	23.4	4	45.2	12	42.4	11	25.8	5
May	11.4	6	13.8	6	5.6	13	22.2	5
June	236.4	9	66.2	11	24.2	10	58.6	8
July	279.0	25	244.1	18	322.8	26	159.0	18
August	181.8	12	470.4	24	172.7	23	494.2	24
September	49.5	2	202.4	11	168.2	22	19.0	9
October	0	0	3.6	3	30.6	3	0.0	2
November	10.6	2	14.8	7	77.4	10	35.8	3
December	0.0	3	11.8	4	83.8	5	37.2	2

Source: -SKAUST Jammu.

2.6.3 Humidity: The humidity of the area reaches its maximum during the month of July-August. It reaches upto 85%-90%.

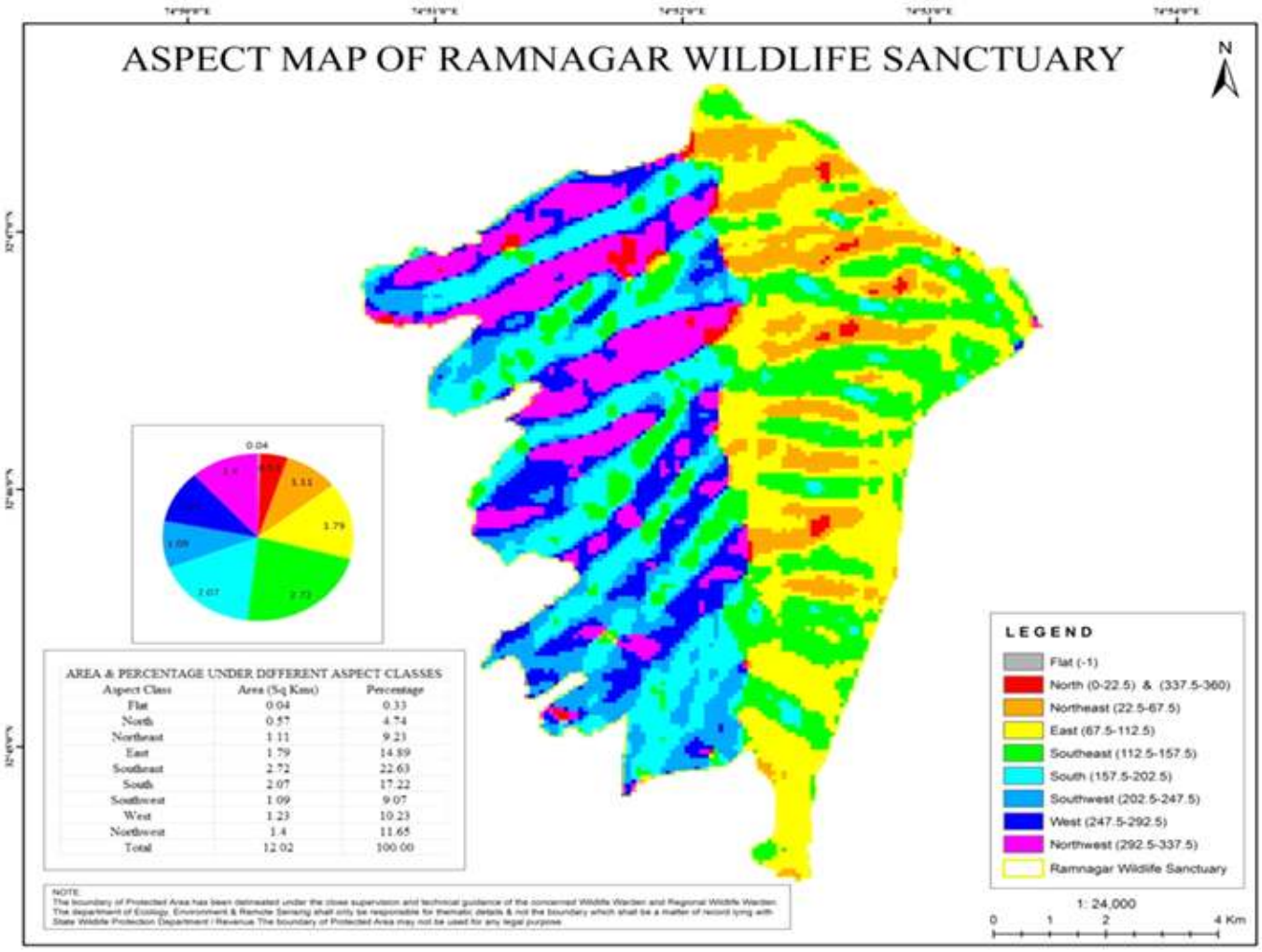
2.6.4 Wind Speed: Wind speed is high in higher elevation of the Sanctuary. However, no authenticated record is available.

2.7 Water Sources:

The Sanctuary has a natural boundary of river Tawi on the South-East boundary which serves as main perennial source of water to the animals of the sanctuary as well as others, while the rest of the area of sanctuary is rain fed and dependent on monsoon. The natural and artificial water ponds maintained by the Department of Wildlife Protection also serve as source of water for the animals and birds. The area is well drained by several nallahs and streams, which are fed by rains. However, much of the area is dry and desolate due to arid environment and very low relative humidity. Since the ground water level is very deep therefore, there is no natural source of water inside the sanctuary area.

Table 2.5 Detail of Water holes/ponds developed inside the Sanctuary are as under:-

S. No.	Type of water body	Source of water	Location	Geo-coordinates
1	Pacca pond (Concrete pond)	Leakage of water supply pipe	Co. 1/P	N 32° 46' 21.72'' E75° 51' 50.62''
2	Pacca pond (Concrete pond)	Rain water	Co. 1/R	N 32° 45' 55.41'' E75° 52' 15.30''
3	Pacca pond (Concrete pond)	Leakage of water supply pipe	Co. 1/R	N 32° 45' 07.59'' E75° 52' 00.80''
4	Pacca pond (Concrete pond)	Leakage of water supply pipe	Co. 1/R	N 32° 45' 06.44'' E75° 52' 13.08''
5	Pacca pond (Concrete pond)	Leakage of water supply pipe	Co. 1/R	N 32° 45' 55.26'' E75° 52' 13.63''
6	Kaccha pond	water overflow	Co. 1/R	N 32° 45' 02.10'' E75° 52' 10.48''
7	Pacca pond (Concrete pond)	Water connection	Co. 1/R	N 32° 45' 42.08'' E75° 52' 19.95''
8	Kaccha Pond	Leakage of water supply pipe	Co. 1/R	N 32° 44' 59.40'' E75° 52' 00.01''
9	Pacca pond (Concrete pond)	Leakage of water supply pipe	Co. 1/P	N 32° 45' 08.17'' E75° 52' 02.77''
10	Kacha Pond	Rain water	Co. 4/R	N 32° 45' 46.48'' E75° 51' 43.54''
11	Pacca pond (Concrete pond)	Rain water	Co. 4/R	N 32° 45' 35.47'' E75° 51' 36.31''
12	Pacca pond (Concrete pond)	Rain water	Co. 4/R	N 32° 45' 33.67'' E75° 51' 37.30''



2.8 Range of Wildlife, Status, Distribution and Habitat:

The Sanctuary offers a wide range of habitat types to flora and fauna. Species like leopard, wild boar, barking deer, Nilgai and many others show its presence in and sometimes outside the Sanctuary as well.

2.8.1 Vegetation: The vegetation of Ramnagar Wildlife Sanctuary is very varied and its geographical location, climate and topography have contributed to the characteristic vegetation and flora. The topography is heterogeneous and marked by various ravines and ridges displaying different types of ecological distribution of the species. The forest in Ramnagar Wildlife Sanctuary represents typical sub-tropical vegetation, dominated mainly by broad leaved tree species, interspersed with few scattered patches of shrubs. The forest has been classified as Northern dry mixed deciduous forest (Type 5B/ C2) in accordance with the classification made by the Champion and Seth 1968.

NORTHERN DRY MIXED DECIDUOUS FOREST (5B/C2):

This forest type is confined to Jammu foot hills of low to moderate elevations. Dense forest sometime interrupted by scrubby vegetation which is predominately found in Ramnagar Wildlife Sanctuary. Soils are well drained and have sandy loam to clay loam texture with normal PH varying

from 7.5 to 8.8. Nitrogen and Phosphorus status are low and Potassium is high. Noteworthy features of this type of forest are mixture of thorny scrub and broad-leaved deciduous vegetation. The general appearance of this type of forest is that upper canopy is light but fairly even and continuous in the climax form. A feature of the forest is the contrast between the hot weather conditions when it is entirely leafless and the soil fully exposed and the monsoon condition when it take on and all most luxuriant appearance from the growth of an ephemeral herbaceous vegetation along with the leafing out of the trees and shrubs.

These forests constitute a mixture of tree species, most of which remain deciduous for several months of dry season and are always mixed with no single species forming a pure stand. The forests are mostly open and comprised of poor-quality trees, with few evergreen or semi-evergreen elements confined in the moist or shady places.

Among arboreal elements *Acacia modesta* has found to be the most prominent tree species, whereas *Mallotus philippensis* has been found gregarious in certain depressions along seasonal streams and mainly found associated with *Cassia fistula*. Other than this *Grewia optiva, Acacia catechu, Dalbergia sissoo, Lannea coromandelica, Flacourtica indica, Mitragyna parvifolia, Aegle marmelos, Emblica officinalis, Bombax ceiba, Zizyphus mauritiana* and *Ehretia laevis* constitute a rich assembly of species.

Among shrubs which form the main composition of the area, *Carrisa oppaca* is most conspicuous, occurring almost in pure formations and covering large areas of ground in certain places, followed by *Adhatoda vasica, Murraya koenigii, Woodfordia fruticosa, Zizyphus numularia, Capparissepiaria, Abutilon indicum* and *Gymnosporia royleana*. The notorious exotic *Lantana camara* is found everywhere. The very common shrub *Carissa spinarum* makes the environment mildly perfumed with white delicate flowers during the hot summers.

Herbaceous layer is structurally and numerically most prominent during monsoon season. Most commonly found herb species include *Sida alba, Anagalis arvensis, Oxalis corniculata, Stellaria media, Malvastrum coromendellianum, Fumaria indica, Diclipterabupleuroides, Bidens bipinnata, Achyranthes aspera, Sonchusasper, Euphorbiahirta, Martynia annua, Cleome viscosa, Medicago denticulata, Peristrophe bicalyculata, Pupalia lappacea* etc. Most of under story is dominated by scattered or gregarious chunks of weed flora. The commonly found species include *Argemone mexicana, Senna occidentalis, Solanum nigrum, Xanthium strumarium, Euphorbia heliscopia, Datura innoxia, Chenopodium album, Malvaparviflora* etc. The most noxious among the weeds in this forest are *Parthenium hysterophorus* and *Cannabis sativa*. Hemi-parasitic shrub *Dendrophthoe falcate* is commonly seen growing on *Acacia modesta.*

The region also supports luxuriant growth of climbers, which somewhat helps in making otherwise sparse forests look dense. Climbers like *Macfadyena unguis-cati, Tinospora cordifolia, Abrus precatorius, Cryptolepisbuchanani, Cuscuta reflexa, Aspidopterys wallichii, Ipomoea carica, Diplocyclos palmatus, Dioscorea belophylla, Merremia aegyptia, Luffa acutangula, Pergularia extensa, Vallaris solanacea* and *Trichosanthes cucumerina* are typical of these hills and slopes.

Green, soothing grasses appear only during the rainy seasons, otherwise the area shows abundant growth of dull *Eulaliopsis binata* and *Saccharum benghalensis. Cynodon dactylon* is the most common and abundant among all grass species in the area. *Setaria verticillata, Heteropogon contortus, Dicanthium*

annulatum, Phalaris minor, Chrysopogon fulvus, Poa annua and *Oplismenus burmannii* are other important grasses. Ferns commonly appear in shady and moist regions above the elevation of 500 m. Ferns belonging to *Adiantum spp* is seen growing near the water courses and in the moist areas.

FLORISTIC COMPOSITION:

Sehrish Gazal and Anil K. Raina et al.(2013) made a study on Life form Composition and Biological Spectrum of Ramnagar Wildlife Sanctuary, J&K, India. A total of 258 tracheophytes have been listed and grouped into various life-form classes. Therophytes (34.36%), Macrophaneophytes (23.16%), Nanophanerophytes (11.58%) and Chamaephytes (10.81%) are the major lifeform classes present in the area. Hemicryptophytes (8.88), Lianas (8.11%), Cryptophytes (2.31%) and Epiphytes (0.77%) were observed to have low occurrence. The biological spectrum of the area was prepared and compared to Raunkiaer's Normal biological spectrum as well as the spectra of the adjacent regions. Phytoclimate of the area was determined as Thero-phanerophytic, as per the Raunkiaer's terminology, with the preponderance of therophytes and phanerophytes. The study reflects the impact of various biotic factors on overall vegetation structure and composition of the area.

Table 2.6 Representation of various taxa in the Ramnagar Wildlife Sanctuary

Groups		Families	Genera	Species
Angiosperms	Dicots	65	176	**225**
	Monocots	5	28	**31**
Gymnosperms		1	1	**1**
Pteridophytes		1	1	**1**
Total		**72**	**206**	**258**

Table 2.7 Total number of generas and species recorded from different families in Ramnagar Wildlife Sanctuary

S.No.	FAMILY	GEN.	SPS.
1	Acanthaceae	6	7
2	Agavaceae	1	1
3	Amaranthaceae	7	11
4	Anacardiaceae	1	1
5	Apocynaceae	5	6
6	Asclepiadaceae	3	3
7	Asteraceae	19	22
8	Bignoniaceae	4	4
9	Bombacaceae	1	1
10	Boraginaceae	2	2
11	Brassicaceae	2	2
12	Cactaceae	1	1
13	Caesalpiniaceae	4	7
14	Cannabaceae	2	2

S.No.	FAMILY	GEN.	SPS.
15	Capparidaceae	3	3
16	Caryophyllaceae	4	4
17	Celastraceae	2	2
18	Chenopodiaceae	1	1
19	Combretaceae	1	2
20	Commelinaceae	1	2
21	Convolvulaceae	4	9
22	Cucurbitaceae	5	5
23	Cuscutaceae	1	1
24	Cyperaceae	1	1
25	Dioscoreaceae	1	1
26	Ebenaceae	1	1
27	Ehretiaceae	1	1
28	Euphorbiaceae	5	8

S.No.	FAMILY	GEN.	SPS.
29	Fabaceae	12	16
30	Fumariaceae	1	1
31	Geraniaceae	1	1
32	Lamiaceae	9	11
33	Loranthaceae	1	1
34	Lythraceae	1	1
35	Malpighiaceae	2	2
36	Malvaceae	7	11
37	Martyniaceae	1	1
38	Meliaceae	2	2
39	Menispermaceae	1	1
40	Mimosaceae	4	7
41	Moraceae	2	8
42	Moringaceae	1	1
43	Myrtaceae	2	2
44	Nyctaginaceae	2	3
45	Oleaceae	1	1
46	Oxalidaceae	1	1
47	Papaveraceae	1	1
48	Papilionaceae	1	1
49	Pedaliaceae	1	1
50	Phrymaceae	1	1
51	Pinaceae	1	1

S.No.	FAMILY	GEN.	SPS.
52	Plantaginaceae	1	1
53	Poaceae	24	26
54	Portulacaceae	1	1
55	Primulaceae	1	1
56	Proteaceae	1	1
57	Pteridaceae	1	1
58	Punicaceae	1	1
59	Ranunculaceae	1	1
60	Rhamnaceae	2	4
61	Rosaceae	3	3
62	Rubiaceae	5	5
63	Rutaceae	3	3
64	Salicaceae	2	2
65	Sapindaceae	1	1
66	Scrophulariaceae	1	1
67	Solanaceae	4	8
68	Sterculiaceae	1	1
69	Tiliaceae	2	3
70	Urticaceae	1	1
71	Verbenaceae	4	5
72	Vitaceae	1	1
	TOTAL	**206**	**258**

2.8.2 Forest Types: The vegetation of the Ramnagar Wildlife Sanctuary comes under the major group "Sub-tropical Northern mixed Dry Deciduous Forests" as per the revised classification by Champion and Seth. On the basis of vegetation, the area is divided into two natural regions.

1. Jammu Kandi and its extension.
2. Sub-tropical pine forests.

1. **Jammu Kandi and its extension:** The low hillocks support fairly dense vegetation of small trees and shrubs. This region supported 3 types of forests.

i) *Acacia* forests: Spreading over the tops and upper slopes of the hilolocks these forests are dominated by *Acacia modesta, Adhatoda vasica* associates like *Ziziphus mauritiana* shrubby plants such as *Capparis separia*. The most conspicuous climbers are *Tinospora cordifolia, Abrus precatorious, Ipomaea spp.* and *Trichosanthes cucumerina, Diplocyclospalmatus* etc.

ii) *Bauhinia* Forests: The forests comprise of *Woodfordia fruticosa, Dodonaeaviscose, Emblica officinalis, Grewia optiva, Ehretialaevis, Mallotus philippensis*. In addition to this climber are *Ichnocarpus frutescens, Vallarisso lanacea and Crypto lepisbuchanani.*

iii) *Lannea coromandelica–Hymenodictyon excelsum* forests: This forest develops in the shaddy and cooler corners of the hillocks, Lannea coromandelica is a dominant tree followed by Hymenodictyon excelsum. Other frequently encounted trees Grewia optiva, Aegle marmelos, Diospyros cordifolia and Bombax ceiba etc.

2. **Sub-Tropical Pine Forests:** The foothills are clothed by semi- deciduous tropical forests in the lower reaches and sub-tropical forests at the higher reaches.

i) *Dodonaea* scrub: This is permanently shrubby landscape covering the low sand stone hillocks. *Dodonaea viscosa* is the dominant shrub, among which isolated individual elements of *carrisa opacum* and *Adhatoda vasica* grow.

ii) Mixed Semi-deciduous forests: This type of forests cover the lower slopes of the hills. Species diversity is high in vegetation type, but a characteristics feature is the lack of dominance by any species. The common species are *Emblica officinalis, Terminalia chebula, Ficus* species.

iii) Sub-Tropical Pine forests: The almost pure stands of chir *(Pinus roxburghii)* is absent. However, there are few scattered trees of Pinus roxburghii present at the top allivations of the ridge.

Table 2.8 List of plant species recorded from the Ramnagar Wildlife Sanctuary

S.No.	NAME OF THE SPECIES	FAMILY	DIVISION	HABIT
1	*Abrus precatorius* L.	Fabaceae	Dicot	Climber
2	*Abutilon indicum* L.	Malvaceae	Dicot	Shrub
3	*Abutilon ramosum* Guill. & Perr.	Malvaceae	Dicot	Shrub
4	*Acacia catechu* Willd.	Mimosaceae	Dicot	Tree
5	*Acacia modesta* Wall.	Mimosaceae	Dicot	Tree
6	*Acacia nilotica* (L.) Delile	Mimosaceae	Dicot	Tree
7	*Achyranthes aspera* L.	Amaranthaceae	Dicot	Herb
8	*Achyranthes bidentata* Blume.	Amaranthaceae	Dicot	Herb
9	*Acrachne racemosa* (Heyneex Roth) Ohwi	Poaceae	Monocot	Grass
10	*Adiantum edgeworthii* Hook.	Pteridaceae	Pteridophyte	Herb
11	*Aegle marmelos* (L.) Corr.	Rutaceae	Dicot	Tree
12	*Aerva scandens* Wall.	Amaranthaceae	Dicot	Herb
13	*Agave americana* L.	Agavaceae	Monocot	Herb
14	*Ageratum conyzoides* L.	Asteraceae	Dicot	Herb
15	*Albizia lebbeck* (L.) Benth.	Mimosaceae	Dicot	Tree
16	*Albizia odoratissima* (L.f.) Benth.	Mimosaceae	Dicot	Tree
17	*Alternanthera ficoidea* (L.) Sm.	Amaranthaceae	Dicot	Herb
18	*Alternanthera pungens* Kunth	Amaranthaceae	Dicot	Herb

19	*Alternanthera sessilis* (L.) DC.	Amaranthaceae	Dicot	Herb
20	*Amaranthus spinosus* L.	Amaranthaceae	Dicot	Herb
21	*Amaranthus viridis* L.	Amaranthaceae	Dicot	Herb
22	*Anagallis arvensis* L.	Primulaceae	Dicot	Herb
23	*Anisomeles indica* (L.) Kuntze	Lamiaceae	Dicot	Herb
24	*Apluda mutica* L.	Poaceae	Monocot	Grass
25	*Arenaria serpyllifolia* L.	Caryophyllaceae	Dicot	Herb
26	*Argemone Mexicana* L.	Papaveraceae	Dicot	Herb
27	*Artemisia* sps.	Asteraceae	Dicot	Herb
28	*Aspidoptery swallichii* Hook.f.	Malpighiaceae	Dicot	Climber
29	*Bambusa arundinacea* Willd.	Poaceae	Monocot	Grass
30	*Bauhinia purpurea* L.	Caesalpiniaceae	Dicot	Tree
31	*Bauhinia vahlii* Wight & Arn.	Caesalpiniaceae	Dicot	Climber
32	*Bauhinia variegata* L.	Caesalpiniaceae	Dicot	Tree
33	*Bidens bipinnata* L.	Asteraceae	Dicot	Herb
34	*Bidens pilosa* L.	Asteraceae	Dicot	Herb
35	*Blepharis maderaspatensis* (L.) B. Heyneex Roth.	Acanthaceae	Dicot	Herb
36	*Blumea paniculata* (Willd) M.R. Almedia.	Asteraceae	Dicot	Herb
37	*Boerhavia diffusa* L.	Nyctaginaceae	Dicot	Herb
38	*Boerhavia repens* L.	Nyctaginaceae	Dicot	Herb
39	*Bombax ceiba* L.	Bombacaceae	Dicot	Tree
40	*Borreria stricta* Schum.	Rubiaceae	Dicot	Herb
41	*Bothriochloa pertusa* (L.) A. Camus	Poaceae	Monocot	Grass
42	*Bougainvillea glabra* Choisy	Bignoniaceae	Dicot	Climber
43	*Brachiaria ramose* (L.) Stapf.	Poaceae	Monocot	Grass
44	*Butea monosperma* Taub.	Fabaceae	Dicot	Tree
45	*Calotropis procera* (Aiton) Dryand.	Asclepiadaceae	Dicot	Shrub
46	*Cannabis sativa* L.	Cannabaceae	Dicot	Herb
47	*Capparis sepiaria* L.	Capparidaceae	Dicot	Shrub
48	*Capsella bursa-pastoris* (L.) Medik.	Brassicaceae	Dicot	Herb
49	*Carissa opaca* Stapf.	Apocynaceae	Dicot	Shrub
50	*Carissa spinarum* L.	Apocynaceae	Dicot	Shrub
51	*Casearia tomentosa* Roxb.	Salicaceae	Dicot	Tree
52	*Cassia fistula* L.	Caesalpiniaceae	Dicot	Tree

53	*Cassine glauca* (Rottb.) Kuntze	Celastraceae	Dicot	Tree
54	*Cayratia trifolia* (L.) Domin	Vitaceae	Dicot	Climber
55	*Cerastium vulgatum* L.	Caryophyllaceae	Dicot	Herb
56	*Chenopodium album* L.	Chenopodiaceae	Dicot	Herb
57	*Chrysopogon fulvus* Chiov.	Poaceae	Monocot	Grass
58	*Cleome viscosa* L.	Capparidaceae	Dicot	Herb
59	*Colebrookea oppositifolia* Smith.	Lamiaceae	Dicot	Shrub
60	*Commelina benghalensis* L.	Commelinaceae	Monocot	Herb
61	*Commelina paludosa* Blume.	Commelinaceae	Monocot	Herb
62	*Convolvulus prostrates* Forssk.	Convolvulaceae	Dicot	Herb
63	*Corchorus aestuans* L.	Tiliaceae	Dicot	Herb
64	*Cordia myxa* L.	Boraginaceae	Dicot	Tree
65	*Coronopus didymus* (L.) Smith.	Brassicaceae	Dicot	Herb
66	*Crataeva adansonii* DC.	Capparidaceae	Dicot	Tree
67	*Crotalaria medicaginea* var.*luxurians* (Benth.) Baker	Papilionaceae	Dicot	Herb
68	*Crotalaria medicaginea* var. *Medicaginea* Lam.	Papilionaceae	Dicot	Herb
69	*Cryptolepis buchananii* Roem. & Schult	Asclepiadaceae	Dicot	Climber
70	*Cuscuta reflexa* Roxb.	Cuscutaceae	Dicot	Climber
71	*Cyanthillium cinereum* (L.) H. Rob.	Asteraceae	Dicot	Herb
72	*Cynodon dactylon* Pers.	Poaceae	Monocot	Grass
73	*Cyperus rotundus* L.	Cyperaceae	Monocot	Herb
74	*Dactyloctenium aegyptium* (L.) Willd.	Poaceae	Monocot	Grass
75	*Dalbergia sissoo* Roxb.	Fabaceae	Dicot	Tree
76	*Datura innoxia* Mill.	Solanaceae	Dicot	Herb
77	*Datura metel* L.	Solanaceae	Dicot	Herb
78	*Deeringia amaranthoides* Merr.	Amaranthaceae	Dicot	Shrub
79	*Delonix regia* (Hook.) Raf.	Caesalpiniaceae	Dicot	Tree
80	*Dendrocalamus strictus* (Roxb.) Nees	Poaceae	Monocot	Grass
81	*Dendrophthoe falcate* Ettings.	Loranthaceae	Dicot	Shrub
82	*Desmodium gangeticum* (L.) DC.	Fabaceae	Dicot	Herb
83	*Desmodium triflorum* (L.) DC.	Fabaceae	Dicot	Herb
84	*Desmodium oojeinense* (Roxb.) H. Ohashi	Fabaceae	Dicot	Tree
85	*Dichanthium annulatum* Stapf.	Poaceae	Monocot	Grass
86	*Dicliptera bupleuroides* Nees.	Acanthaceae	Dicot	Herb

87	*Digitaria ciliaris* (Retz.) Koeler	Poaceae	Monocot	Grass
88	*Dioscorea belophylla* (Prain) Voigt exHaines	Dioscoreaceae	Monocot	Climber
89	*Diospyros cordifolia* Roxb.	Ebenaceae	Dicot	Tree
90	*Diplocyclos palmatus* Jeff.	Cucurbitaceae	Dicot	Climber
91	*Dipteracanthus prostrates* Nees.	Acanthaceae	Dicot	Herb
92	*Dodonaea viscose* Jacq.	Sapindaceae	Dicot	Shrub
93	*Echinochloa colona* (L.) Link	Poaceae	Monocot	Grass
94	*Ehretia laevis* Roxb.	Ehretiaceae	Dicot	Tree
95	*Eleusine indica* (L.) Gaertn.	Poaceae	Monocot	Grass
96	*Eragrostis amabilis* (L.) Wight & Arn.	Poaceae	Monocot	Grass
97	*Erigeron bonariensis* L.	Asteraceae	Dicot	Herb
98	*Ervatamia coronaria* (Jacq.) Stapf.	Apocynaceae	Dicot	Shrub
99	*Eucalyptus tereticornis* Sm.	Myrtaceae	Dicot	Tree
100	*Eulaliopsis binata* (Retz.) C.E.Hubb.	Poaceae	Monocot	Grass
101	*Euphorbia helioscopia* L.	Euphorbiaceae	Dicot	Herb
102	*Euphorbia hirta* L.	Euphorbiaceae	Dicot	Herb
103	*Euphorbia prostrata* Ait.	Euphorbiaceae	Dicot	Herb
104	*Euphorbia royleana* Boiss.	Euphorbiaceae	Dicot	Shrub
105	*Evolvulus alsinoides* L.	Convolvulaceae	Dicot	Herb
106	*Ficus auriculata* Lour.	Moraceae	Dicot	Tree
107	*Ficus benghalensis* L.	Moraceae	Dicot	Tree
108	*Ficus hispida* L.f.	Moraceae	Dicot	Tree
109	*Ficus palmata* Forsk.	Moraceae	Dicot	Tree
110	*Ficus racemosa* L.	Moraceae	Dicot	Tree
111	*Ficus religiosa* L.	Moraceae	Dicot	Tree
112	*Ficus semicordata* Buch. – HamexSm.	Moraceae	Dicot	Tree
113	*Flacourtia indica* Merr.	Salicaceae	Dicot	Tree
114	*Flueggea virosa* Roxb.	Euphorbiaceae	Dicot	Shrub
115	*Fumaria indica* Pugsley.	Fumariaceae	Dicot	Herb
116	*Galium aparine* L.	Rubiaceae	Dicot	Herb
117	*Gamochaeta pensylvanica* (Willd.) Cabrera	Asteraceae	Dicot	Herb
118	*Geranium rotundifolium* L.	Geraniaceae	Dicot	Herb
119	*Gmelina arborea* Roxb.	Verbenaceae	Dicot	Tree
120	*Gnaphalium pulvinatum* Del.	Asteraceae	Dicot	Herb
121	*Gomphrena serrata* L.	Amaranthaceae	Dicot	Herb

122	*Grevillea robusta* A.Cunn.ex R.Br.	Proteaceae	Dicot	Tree
123	*Grewia optiva* J.R. Drumm	Tiliaceae	Dicot	Tree
124	*Grewia tenax* (Forssk.) Fiori	Tiliaceae	Dicot	Tree
125	*Gymnosporia royleana* Wall. ex M.A. Lawson	Celastraceae	Dicot	Shrub
126	*Helicteres isora* L.	Sterculiaceae	Dicot	Shrub
127	*Heteropogon contortus* Beauv.	Poaceae	Monocot	Grass
128	*Hibiscus lobatus* (Murr.) Kuntze.	Malvaceae	Dicot	Herb
129	*Hiptage benghalensis* Kurz.	Malpighiaceae	Dicot	Climber
130	*Holarrhena antidysenterica* Wall.	Apocynaceae	Dicot	Tree
131	*Hymenodictyon excelsum* Wall.	Rubiaceae	Dicot	Tree
132	*Hyptis suaveolens* (L.) Poit.	Lamiaceae	Dicot	Herb
133	*Imperata cylindrical* (L.) Beauv.	Poaceae	Monocot	Grass
134	*Indigofera trifoliata* L.	Fabaceae	Dicot	Herb
135	*Ipomoea cairica* (L.) Sweet.	Convolvulaceae	Dicot	Climber
136	*Ipomoea carnea* Jack.	Convolvulaceae	Dicot	Shrub
137	*Ipomoea muricata* Jacq.	Convolvulaceae	Dicot	Climber
138	*Ipomoea nil* (L.) Roth.	Convolvulaceae	Dicot	Climber
139	*Ipomoea purpurea* (L.) Roth.	Convolvulaceae	Dicot	Climber
140	*Jacaranda mimosifolia* D.Don	Bignoniaceae	Dicot	Tree
141	*Jasminum auriculatum* Wall.	Oleaceae	Dicot	Shrub
142	*Justicia adhatoda* Nees.	Acanthaceae	Dicot	Shrub
143	*Kydia calycina* Roxb.	Malvaceae	Dicot	Tree
144	*Lactuca dissecta* D. Don.	Asteraceae	Dicot	Herb
145	*Lannea coromandelica* Merr.	Anacardiaceae	Dicot	Tree
146	*Lantana camara* var.*aculeata* (L.) Moldenke	Verbenaceae	Dicot	Shrub
147	*Launaea procumbens* Roxb.	Asteraceae	Dicot	Herb
148	*Lepidagathis cuspidata* Nees.	Acanthaceae	Dicot	Shrub
149	*Leucaena leucocephala* (Lam.) de Wit	Mimosaceae	Dicot	Tree
150	*Leucas aspera* Spreng.	Lamiaceae	Dicot	Herb
151	*Leucas cephalotes* (Roth) Spreng.	Lamiaceae	Dicot	Herb
152	*Luffa acutangula* (L.) Roxb.	Cucurbitaceae	Dicot	Climber
153	*Macfadyena unguis-cati* L.	Bignoniaceae	Dicot	Climber
154	*Mallotus philippensis* Muell. Arg.	Euphorbiaceae	Dicot	Tree
155	*Malva parviflora* L.	Malvaceae	Dicot	Herb
156	*Malvastrum coromandelianum* Garcke.	Malvaceae	Dicot	Herb

157	*Martynia annua* L.	Martyniaceae	Dicot	Herb
158	*Mazus pumilus* (Burm.f.) Steenis	Phrymaceae	Dicot	Herb
159	*Medicago denticulate* Willd.	Fabaceae	Dicot	Herb
160	*Medicago lupulina* L.	Fabaceae	Dicot	Herb
161	*Melia azedarach* L.	Meliaceae	Dicot	Tree
162	*Melilotus alba* Medic.	Fabaceae	Dicot	Herb
163	*Melilotus indica* (L.) All.	Fabaceae	Dicot	Herb
164	*Mentha arvensis* L.	Lamiaceae	Dicot	Herb
165	*Merremia aegyptia* Urb.	Convolvulaceae	Dicot	Climber
166	*Merremia dissecta* Hall.f.	Convolvulaceae	Dicot	Climber
167	*Micromeria biflora* Benth.	Lamiaceae	Dicot	Herb
168	*Mimosa rubicaulis* Lamk.	Mimosaceae	Dicot	Shrub
169	*Mirabilis jalapa* L.	Nyctaginaceae	Dicot	Herb
170	*Mitragyna parvifolia* Korth.	Rubiaceae	Dicot	Tree
171	*Momordica charantia* L.	Cucurbitaceae	Dicot	Climber
172	*Moringa oleifera* Lamk.	Moringaceae	Dicot	Tree
173	*Morus alba* L.	Moraceae	Dicot	Tree
174	*Mucuna pruriens* (L.) DC.	Fabaceae	Dicot	Climber
175	*Murraya koenigii* Spreng.	Rutaceae	Dicot	Shrub
176	*Nyctanthes arbortristis* L.	Verbenaceae	Dicot	Tree
177	*Ocimum americanum* L.	Lamiaceae	Dicot	Herb
178	*Ocimum basilicum* L.	Lamiaceae	Dicot	Herb
179	*Oplismenus burmannii* P. Beauv.	Poaceae	Monocot	Grass
180	*Oplismenus composites* (L.) Beauv	Poaceae	Monocot	Grass
181	*Opuntia ficus-indica* (L.) Mill.	Cactaceae	Dicot	Shrub
182	*Oroxylum indicum* Vent.	Bignoniaceae	Dicot	Tree
183	*Oxalis corniculata* L.	Oxalidaceae	Dicot	Herb
184	*Parkinsonia aculeate* L.	Fabaceae	Dicot	Tree
185	*Parthenium hysterophorus* L.	Asteraceae	Dicot	Shrub
186	*Paspalidium flavidum* (Retz.) A.Camus	Poaceae	Monocot	Grass
187	*Pennisetum orientale* L.	Poaceae	Monocot	Grass
188	*Pentanema vestita* (Wall. exDC.) Ling	Asteraceae	Dicot	Herb
189	*Pergularia daemia* (Forssk.)	Asclepiadaceae	Dicot	Climber
190	*Peristrophe bicalyculata* (Retzius) Nees	Acanthaceae	Dicot	Herb
191	*Peristrophe paniculata* Brummitt.	Acanthaceae	Dicot	Herb

192	*Phalaris minor* Retz.	Poaceae	Monocot	Grass
193	*Phyllanthus emblica* L.	Euphorbiaceae	Dicot	Tree
194	*Physalis angulata* L.	Solanaceae	Dicot	Herb
195	*Pinus roxburghii* Sarg.	Pinaceae	Gym.	Tree
196	*Plantago lanceolata* L.	Plantaginaceae	Dicot	Herb
197	*Poa annua* L.	Poaceae	Monocot	Grass
198	*Pogostemon benghalensis* (Burm.f.) Kuntze	Lamiaceae	Dicot	Shrub
199	*Portulaca pilosa* L.	Portulacaceae	Dicot	Herb
200	*Potentilla supina* L.	Rosaceae	Dicot	Herb
201	*Premna barbata* Wall.	Verbenaceae	Dicot	Tree
202	*Premna latifolia* Roxb.	Verbenaceae	Dicot	Tree
203	*Pueraria tuberosa* (Willd.) DC.	Fabaceae	Dicot	Climber
204	*Punica granatum* L.	Punicaceae	Dicot	Shrub
205	*Pupalia lappacea* (L.) Juss.	Amaranthaceae	Dicot	Herb
206	*Pyrus pashia*	Rosaceae	Dicot	Tree
207	*Ranunculus muricatus* L.	Ranunculaceae	Dicot	Herb
208	*Rhamnus triquetra* Wall.	Rhamnaceae	Dicot	Tree
209	*Ricinus communis* L.	Euphorbiaceae	Dicot	Shrub
210	*Rosa multiflora* Lindl.	Rosaceae	Dicot	Shrub
211	*Saccharum bengalense* Retz.	Poaceae	Monocot	Grass
212	*Salvia plebeia* R.Br.	Lamiaceae	Dicot	Herb
213	*Saussurea heteromalla* Hand. - Mazz.	Asteraceae	Dicot	Herb
214	*Senna occidentalis* (L.) Link.	Caesalpiniaceae	Dicot	Herb
215	*Senna tora* (L.) Roxb.	Caesalpiniaceae	Dicot	Shrub
216	*Sesamum indicum* L.	Pedaliaceae	Dicot	Herb
217	*Setaria glauca* P. Beauv.	Poaceae	Monocot	Grass
218	*Setaria verticillata* (Linn.) P. Beauv.	Poaceae	Monocot	Grass
219	*Sida alba* L.	Malvaceae	Dicot	Herb
220	*Sida cordata* (Burn.f.) Borss. Waalk.	Malvaceae	Dicot	Herb
221	*Sida cordifolia* L.	Malvaceae	Dicot	Herb
222	*Sida spinosa* L.	Malvaceae	Dicot	Herb
223	*Silene conoidea* L.	Caryophyllaceae	Dicot	Herb
224	*Silybum marianum* (L.) Gaertn.	Asteraceae	Dicot	Herb
225	*Solanum erianthum* D. Don	Solanaceae	Dicot	Shrub
226	*Solanum nigrum* L.	Solanaceae	Dicot	Herb

227	*Solanum viarum* Dun.	Solanaceae	Dicot	Herb
228	*Solanum virginianum* L.	Solanaceae	Dicot	Herb
229	*Solena heterophylla* Lour.	Cucurbitaceae	Dicot	Climber
230	*Sonchus arvensis* F.	Asteraceae	Dicot	Herb
231	*Sonchus asper Garsault*.	Asteraceae	Dicot	Herb
232	*Sonchus brachyotus* DC.	Asteraceae	Dicot	Herb
233	*Stellaria media* (L.) Vill.	Caryophyllaceae	Dicot	Herb
234	*Syzygium cumini* Skeels.	Myrtaceae	Dicot	Tree
235	*Taraxacum officinale* Webber.	Asteraceae	Dicot	Herb
236	*Tephrosia pumila* Pers.	Fabaceae	Dicot	Herb
237	*Terminalia arjuna* Wight & Arn.	Combretaceae	Dicot	Tree
238	*Terminalia bellirica* Roxb.	Combretaceae	Dicot	Tree
239	*Tinospora cordifolia* Hk.f & T.	Menispermaceae	Dicot	Climber
240	*Toona ciliate* M.Roem.	Meliaceae	Dicot	Tree
241	*Trema politoria* (Planch.) Blume	Cannabaceae	Dicot	Tree
242	*Trichodesma indicum* R. Br.	Boraginaceae	Dicot	Herb
243	*Trichosanthes cucumerina* L.	Cucurbitaceae	Dicot	Climber
244	*Tridax procumbens* L.	Asteraceae	Dicot	Herb
245	*Trifolium repens* L.	Fabaceae	Dicot	Herb
246	*Urena lobata* L.	Malvaceae	Dicot	Shrub
247	*Urtica urens* L.	Urticaceae	Dicot	Herb
248	*Vallaris solanacea* Kuntze.	Apocynaceae	Dicot	Climber
249	*Verbascum thapsus* L.	Scrophulariaceae	Dicot	Herb
250	*Wendlandia heynei* (Schult.) Santapau & Merchant	Rubiaceae	Dicot	Tree
251	*Withania somnifera* Dunal.	Solanaceae	Dicot	Herb
252	*Woodfordia fruticosa* Kurz.	Lythraceae	Dicot	Shrub
253	*Wrightia tomentosa* Roem. & Schult.	Apocynaceae	Dicot	Tree
254	*Xanthium strumarium* L.	Asteraceae	Dicot	Herb
255	*Youngia japonica* (L.) DC.	Asteraceae	Dicot	Herb
256	*Zanthoxylum armatum* DC.	Rutaceae	Dicot	Shrub
257	*Ziziphus nummularia* (Burm.f.) Wight & Arn.	Rhamnaceae	Dicot	Shrub
258	*Zizyphus mauritiana* Lamk.	Rhamnaceae	Dicot	Tree
259	*Zizyphus oxyphylla* Edrew.	Rhamnaceae	Dicot	Tree

Prominent Flora of Ramnagar Wildlife Sanctuary

Emblica officinalis

Aegle marmelos

Ziziphus mauritiana

Flacourtia indica

Crissa bispinosa

Acacia catechu

Pinus roxburghii

Cassia fistula

Nyctanthes arbortristis

Woodfordia fruticosa

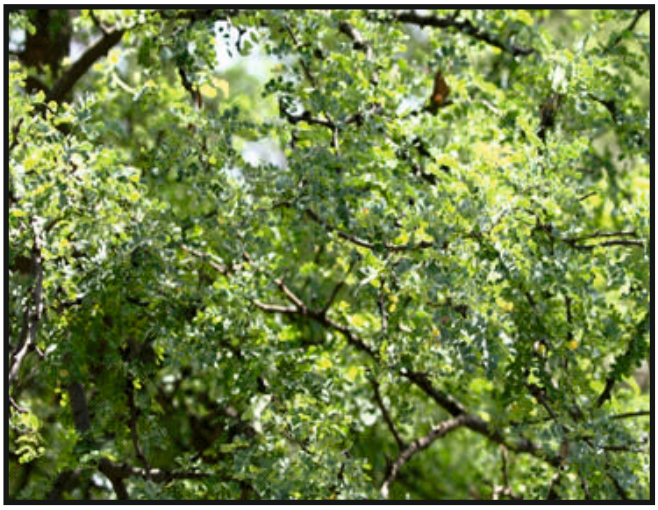
Bombax ceiba

Mallotus philippensis

Murraya koenigii

Ficus religiosa

Ficus benghalensis



Acacia modesta

Dalbergia sissoo

Adhatoda vasica

2.8.3 Fauna: The area hosts a wide variety of fauna, avifauna typical to the area, besides a variety of snakes and other reptiles are also found. The lower foot hills are characterized by the presence of scrub forests at lower elevations and mixed deciduous vegetation at higher elevations. Accordingly, locally common animals such as Leopard, barking deer, Indian porcupine and birds such as Red Jungle fowl, Jungle bush quail and reptiles such as Indian Rock Python, Cobra, Viper, Common krait, Grey rat snake and cat snake are common.

The diversity of mammals found in the wildlife sanctuary area are as under:

A. Mammals:

Table 2.9 Checklist of mammals of Ramnagar Wildlife Sanctuary

S.No.	Scientific Name	Common Name	Family	IUCN status
1	*Boselaphus tragocamelus*	Nilgai	**Bovidae**	LC
2	*Canis aureus*	Golden Jackal	**Canidae**	LC
3	*Felis chaus*	Jungle Cat	**Felidae**	LC
4	*Funambulus pennantii*	Northern Palm Squirrel	**Sciuridae**	LC
5	*Herpestes edwardsi*	Indian Grey Mongoose	**Herpestidae**	LC
6	*Hystrix indica*	Indian Crested Porcupine	**Hystricidae**	LC
7	*Lepus nigricollis ruficaudatus*	Rufous-tailed Hare	**Leporidae**	LC
8	*Macaca mulatta*	Rhesus Macaque	**Cercopithecidae**	LC
9	*Muntiacus muntjak*	Indian Muntjac	**Cervidae**	LC
10	*Panthera pardus*	Leopard	**Felidae**	VU
11	*Paradoxurus hermaphroditus*	Asian Palm Civet	**Viverridae**	LC
12	*Viverricula indica*	Small Indian Civet	**Viverridae**	LC
13	*Sus scrofa*	Wild Boar	**Suidae**	LC

B. Birds:

It has been said that birds could exist without human but that human would perish without birds. This observation has been further amplified by the remark that "But for the trees the insects would perish; but for the insects the birds would perish, but for the birds the trees would perish and to follow the inexorable laws of Nature to the conclusion of their awful vengeance, but for the trees the world would perish'. In J&K more than 550 species of birds are reported and more than 400 species are found in the Jammu Province.

Important Bird Area IN-JK -16:

Bird Life International has made a promising start in finding key areas by coming up a criteria that can be used to identify IBA's. A compendium of IBA's in India compiled by Bombay Natural History Society (BNHS) through the Indian Bird Conservation Network (IBCN).

The Ramnagar Wildlife Sanctuary has been categorized as A-1 i.e. it includes Threatened Species while A-2 stands for Restricted Range species, A-3 for Dionne species, A-4 means congregatory species. The site code for Ramnagar Wildlife Sanctuary is IN-JK-16, includes two critically Endangered Species i.e. White-rumped Vulture *(Gyps bengalensis)* and Slender Billed Vulture *(Gyps tenuirostris)*, an older record indeed.

Based on the preliminary investigations by BNHS, 37 species have been found in this Sanctuary. Among pheasants Red Jungle Fowl *(Gallus gallus)*, Kalij Pheasant *(Lophura leucomelanos)* and Peafowl *(Pavo cristatus)* are notable, Grey francolin *(Francolinus pondicerianus)* quite common.

Table 2.10 Checklist of Birds found in and around Ramnagar Wildlife Sanctuary (Based on direct sightings / calls)

S.No.	Scientific Name	Common Name	Family	IUCN status
1	*Abrornis humei*	Hume's Leaf Warbler	**Phylloscopidae**	LC
2	*Accipiter badius*	Shikra	**Accipitridae**	LC
3	*Acridotheres tristis*	Common Myna	**Sturnidae**	LC
4	*Actitis hypoleucos*	Common Sandpiper	**Scolopacidae**	LC
5	*Aegithina tiphia*	Common Iora	**Aegithinidae**	LC
6	*Alcedo atthis*	Common Kingfisher	**Alcedinidae**	LC
7	*Amaurornis phoenicurus*	White-breasted Waterhen	**Rallidae**	LC
8	*Anthus rufulus*	Paddy field pipit	**Motacillidae**	LC
9	*Ardea cinerea*	Grey Heron	**Ardeidae**	LC
10	*Ardea intermedia*	Intermediate Egret	**Ardeidae**	LC
11	*Ardeola grayii*	Indian Pond Heron	**Ardeidae**	LC
12	*Bubulcus ibis*	Cattle Egret	**Ardeidae**	LC
13	*Butastur teesa*	White-eyed Buzzard	**Accipitridae**	LC
14	*Buteo rufinus*	Long-legged Buzzard	**Accipitridae**	LC
15	*Cacomantis passerines*	Grey-bellied Cuckoo	**Cuculidae**	LC
16	*Certhia himalayana*	Bar-tailed Treecreeper	**Certhiidae**	LC
17	*Ceryle rudis*	Pied Kingfisher	**Alcedinidae**	LC
18	*Chelidorhynx hypoxanthus*	Yellow-bellied Fairy-fantail	**Stenostiridae**	LC

19	*Chrysomma sinense*	Yellow-eyed Babbler	**Paradoxornithidae**	LC
20	*Cinnyris asiaticus*	Purple Sunbird	**Nectariniidae**	LC
21	*Circaetus gallicus*	Short-toed Snake-Eagle	**Accipitridae**	LC
22	*Clamator jacobinus*	Pied Cuckoo	**Cuculidae**	LC
23	*Columba livia*	Rock Pigeon	**Columbidae**	LC
24	*Copsychus saularis*	Oriental Magpie Robin	**Muscicapidae**	LC
25	*Corvus macrorhynchos*	Large-billed Crow	**Corvidae**	LC
26	*Corvus splendens*	House Crow	**Corvidae**	LC
27	*Cyornis rubeculoides*	Blue-throated Flycatcher	**Muscicapidae**	LC
28	*Dendrocitta vagabunda*	Rufous Treepie	**Corvidae**	LC
29	*Dendrocopos canicapillus*	Grey-capped Pygmy Woodpecker	**Picidae**	LC
30	*Dendrocopos macei*	Fulvous-breasted Pied Woodpecker	**Picidae**	LC
31	*Dicrurus hottentottus*	Hair crested drongo	**Dicruridae**	LC
32	*Dicrurus leucophaeus*	Ashy Drongo	**Dicruridae**	LC
33	*Dicrurus macrocercus*	Black Drongo	**Dicruridae**	LC
34	*Dinopium benghalense*	Lesser Golden-backed Woodpecker	**Picidae**	LC
35	*Egretta garzetta*	Little Egret	**Ardeidae**	LC
36	*Elanus caeruleus*	Black-winged Kite	**Accipitridae**	LC
37	*Eudynamys scolopaceus*	Asian Koel	**Cuculidae**	LC
38	*Falco peregrinus peregrinator*	Shaheen Falcon	**Falconidae**	LC
39	*Falco Subbuteo*	Eurasian Hobby	**Falconidae**	LC
40	*Falco tinnunculus*	Eurasian Kestrel	**Falconidae**	LC
41	*Francolinus pondicerianus*	Grey Francolin	**Phasianidae**	LC
42	*Galerida cristata*	Lark, Crested	**Alaudidae**	LC
43	*Gallus gallus*	Red Junglefowl	**Phasianidae**	LC
44	*Geokichla citrine*	Orange-headed Thrush	**Turdidae**	LC
45	*Glaucidium cuculoides*	Asian Barred Owlet	**Strigidae**	LC
46	*Gymnoris xanthocollis*	Yellow-throated Sparrow	**Passeridae**	LC
47	*Gyps bengalensis*	White-rumped Vulture	**Accipitridae**	CR
48	*Gyps himalayensis*	Himalayan Vulture	**Accipitridae**	NT
49	*Halcyon smyrnensis*	White-throated Kingfisher	**Alcedinidae**	LC

50	*Hierococcyx varius*	Common Hawk Cuckoo	**Cuculidae**	LC
51	*Hirundo rustica*	Barn swallow	**Hirundinidae**	LC
52	*Lanius schach*	Long-tailed Shrike	**Laniidae**	LC
53	*Lonchura punctulata*	Scaly-breasted Munia	**Estrildidae**	LC
54	*Merops orientalis*	Green Bee-eater	**Meropidae**	LC
55	*Microcarbo niger*	Little Cormorant	**Phalacrocoracidae**	LC
56	*Milvus migrans*	Black Kite	**Accipitridae**	LC
57	*Monticola rufiventris*	Chestnut-bellied Rock Thrush	**Muscicapidae**	LC
58	*Motacilla alba*	White Wagtail	**Motacillidae**	LC
59	*Motacilla maderaspatensis*	White-browed Wagtail	**Motacillidae**	LC
60	*Myophonus caeruleus*	Blue Whistling Thrush	**Muscicapidae**	LC
61	*Neophron percnopterus*	Egyptian Vulture	**Accipitridae**	EN
62	*Niltava sundara*	Rufous-bellied Niltava	**Muscicapidae**	LC
63	*Nycticorax nycticorax*	Black-crowned Night Heron	**Ardeidae**	LC
64	*Ocyceros birostris*	Indian Grey Hornbill	**Bucerotidae**	LC
65	*Oenanthe fusca*	Brown Rock Chat	**Muscicapidae**	LC
66	*Oriolus kundoo*	Indian Golden Oriole	**Oriolidae**	LC
67	*Orthotomus sutorius*	Common Tailorbird	**Cisticolidae**	LC
68	*Parus cinereus*	Cinereous Tit	**Paridae**	LC
69	*Parus monticolus*	Green-backed Tit	**Paridae**	LC
70	*Passer cinnamomeus*	Russet Sparrow	**Passeridae**	LC
71	*Passer domesticus*	House Sparrow	**Passeridae**	LC
72	*Pavo cristatus*	Indian Peafowl	**Phasianidae**	LC
73	*Pellorneum ruficeps*	Puff throated babbler	**Pellorneidae**	LC
74	*Perdicula asiatica*	Jungle Bush quail	**Phasianidae**	LC
75	*Pericrocotus ethologus*	Long-tailed Minivet	**Campephagidae**	LC
76	*Pernis ptilorhynchus*	Oriental Honey-buzzard	**Accipitridae**	LC
77	*Phoenicurus fuliginosus*	Plumbeous Water Redstart	**Muscicapidae**	LC
78	*Phoenicurus ochruros*	Black Redstart	**Muscicapidae**	LC
79	*Phylloscopus xanthoschistos*	Grey-hooded Leaf Warbler	**Phylloscopidae**	LC
80	*Picumnus innominatus*	Speckled Piculet	**Picidae**	LC

81	*Pitta brachyuran*	Indian Pitta	**Pittidae**	LC
82	*Pomatorhinus erythrogenys*	Rusty-cheeked Scimitar babbler	**Timaliidae**	LC
83	*Prinia hodgsonii*	Grey-breasted Prinia	**Cisticolidae**	LC
84	*Prinia socialis*	Ashy Prinia	**Cisticolidae**	LC
85	*Psilopogon asiaticus*	Blue-throated Barbet	**Megalaimidae**	LC
86	*Psilopogon haemacephalus*	Coppersmith Barbet	**Megalaimidae**	LC
87	*Psilopogon zeylanicus*	Brown-headed Barbet	**Megalaimidae**	LC
88	*Psittacula cyanocephala*	Plum-headed Parakeet	**Psittaculidae**	LC
89	*Psittacula eupatria*	Alexandrine Parakeet	**Psittaculidae**	NT
90	*Psittacula krameri*	Rose-ringed Parakeet	**Psittaculidae**	LC
91	*Pycnonotus cafer*	Red-vented Bulbul	**Pycnonotidae**	LC
92	*Pycnonotus leucogenis*	Himalayan Bulbul	**Pycnonotidae**	LC
93	*Rhipidura albicollis*	White-throated Fantail	**Rhipiduridae**	LC
94	*Saxicola caprata*	Pied Bushchat	**Muscicapidae**	LC
95	*Saxicola ferreus*	Grey Bushchat	**Muscicapidae**	LC
96	*Saxicoloides fulicatus*	Indian Robin	**Muscicapidae**	LC
97	*Stachyridopsis pyrrhops*	Black-chinned babbler	**Timaliidae**	LC
98	*Streptopelia chinensis*	Spotted Dove	**Columbidae**	LC
99	*Streptopelia decaocto*	Eurasian Collared Dove	**Columbidae**	LC
100	*Streptopelia senegalensis*	Laughing Dove	**Columbidae**	LC
101	*Sturnia pagodarum*	Brahminy Starling	**Sturnidae**	LC
102	*Sturnus vulgaris*	Common Starling	**Sturnidae**	LC
103	*Sylvia curruca*	Lesser Whitethroat	**Sylviidae**	LC
104	*Tephrodornis pondicerianus*	Common Woodshrike	**Vangidae**	LC
105	*Terpsiphone paradise*	Indian Paradise-Flycatcher	**Monarchidae**	LC
106	*Turdoides striata*	Jungle Babbler	**Leiothrichidae**	LC
107	*Turdus boulboul*	Grey-winged Blackbird	**Turdidae**	LC
108	*Upupa epops*	Common Hoopoe	**Upupidae**	LC
109	*Vanellus indicus*	Red-wattled Lapwing	**Charadriidae**	LC
110	*Zosterops palpebrosus*	Oriental White-eye	**Zosteropidae**	LC
111	*Gyps tenuirostris*	Slender-billed Vulture	**Accipitridae**	CR

C. Butterflies of Jammu Region:

Butterflies are among nature's most beautiful gifts to mankind. They have been admired and studied for centuries not only by artists but also by poets and the scientist. Butterflies (order Lepidoptera: suborder Rhopalocera) are the most brilliantly coloured attractive insects and these together with mothsform one of the largest groups in animal kingdom perhaps second only to the beetles.

Butterflies are sun-loving insects and are found on the plants and flowers growing in open fields, gardens and parks, along the roadsides, etc. Sometimes they may be seen in shady and humid areas and they prefer to hover to young and bushy plants. They may live a solitary form or gregariously. They areactive fliers except few deniers, which are slow fliers. When at rest, they usually keep their wings folded erect upwards. If approached, the insects usually fly away.

Butterflies are ecologically very important. Though adults of almost all species are harmless, rather useful as pollinators, the larval or the younger stages cause much loss to a great variety of economically important plants including agricultural crops, fruit trees plantation and kitchen garden etc. A 'butterfly park' to be made in the vicinity or inside the sanctuary by planting flowering native plants by clearing the area of lantana weed. It will boost the biodiversity and the revenue of the sanctuary. A research on the butterflies of Jammu province has been done by Jammu University and has found the following species. A study has to be done to ascertain which of the following species found in the Ramnagar Wildlife Sanctuary.

Table 2.11 Checklist of Butterflies in Jammu region (based on direct sightings)

S.No.	Scientific Name	Common Name	Family
1	*Ariadne merione*	Common castor	**Nymphalidae**
2	*Athyma perius*	Common sergeant	**Nymphalidae**
3	*Belenois aurota*	Pioneer	**Pieridae**
4	*Caprona ransonneti*	Golden Angle	**Hesperiidae**
5	*Catopsilia Pomona*	Common emigrant	**Pieridae**
6	*Catopsilia pyranthe*	Mottled emigrant	**Pieridae**
7	*Celaenorrhinus leucocera*	Common spotted Flat	**Hesperiidae**
8	*Cepora Nerissa*	Common Gull	**Pieridae**
9	*Chilades lajus*	Lime blue	**Lycaenidae**
10	*Chilades pandava*	Plains cupid	**Lycaenidae**
11	*Colias erate*	Pale clouded yellow	**Pieridae**
12	*Curetis bulis*	Bright sunbeam	**Lycaenidae**
13	*Cyrestis thyodamas*	Common map	**Nymphalidae**
14	*Danaus chrysippus*	Plain tiger	**Nymphalidae**
15	*Danaus genutia*	Striped tiger	**Nymphalidae**

16	*Delias eucharis*	Indian jezebel	**Pieridae**
17	*Euchrysops cnejus*	Gram blue	**Lycaenidae**
18	*Euploea core*	Common crow	**Nymphalidae**
19	*Euploea mulciber*	Striped blue crow	**Nymphalidae**
20	*Eurema andersonii*	One spot grass yellow	**Pieridae**
21	*Hypolimnas misippus*	Danaid Eggfly	**Nymphalidae**
22	*Ixias pyrene*	Yellow orange tip	**Pieridae**
23	*Junonia almanac*	Peacock pansy	**Nymphalidae**
24	*Junonia atlites*	Grey pansy	**Nymphalidae**
25	*Junonia hierta*	Yellow pansy	**Nymphalidae**
26	*Junonia lemonias*	Lemon pansy	**Nymphalidae**
27	*Junonia orithya*	Blue pansy	**Nymphalidae**
28	*Leptotes plinius*	Zebra Blue	**Lycaenidae**
29	*Lethe Europa*	Bamboo treebrown	**Nymphalidae**
30	*Matapa aria*	Common branded Redeye	**Hesperiidae**
31	*Neptis hylas*	Common sailor	**Nymphalidae**
32	*Papilio demoleus*	Lime Swallowtail	**Papilionidae**
33	*Papilio polytes*	Common Mormon	**Papilionidae**
34	*Parantica aglea*	Glassy tiger	**Nymphalidae**
35	*Phalanta phalantha*	Common leopard	**Nymphalidae**
36	*Pieris brassicae*	Large cabbage white	**Pieridae**
37	*Prosotas nora*	Common line blue	**Lycaenidae**
38	*Pseudozizeeria maha*	Pale grass blue	**Lycaenidae**
39	*Rapala nissa*	Common Flash	**Lycaenidae**
40	*Sarangesa dashara dashara*	Indian common small flat	**Hesperiidae**
41	*Spindasis vulcanus*	Common Silverline	**Lycaenidae**
42	*Surendra quercetorum*	Common Acacia Blue	**Lycaenidae**
43	*Tarucus hazara*	Dark violet pierrot	**Lycaenidae**
44	*Telicota bambusae*	Oriental dark palm-dart	**Hesperiidae**
45	*Tirumala limniace*	Blue tiger	**Nymphalidae**
46	*Ypthima asterope*	Common three-ring	**Nymphalidae**

D. Reptiles:

Reptiles are the animals in the class Reptilia. Living reptiles comprise turtles, squamates (lizards & snakes) and rhynchocephalians (tuatara). Reptiles are tetrapod vertebrates, creatures that either have four limbs or like snakes that are descended from four-limbed ancestors. Unlike amphibians, reptiles do not have an aquatic larval stage. Most reptiles are oviparous, although several species of squamates are viviparous, as were some extinct aquatic clades the fetus develops within the mother, using a (non-mammalian) placenta rather than contained in an eggshell. As far as Ramnagar wildlife sanctuary is concerned it houses several reptiles like snakes, turtles, lizards, etc.

The entire tract is inhabited by a diverse variety of poisonous and non-poisonous snakes. Among poisonous snakes are Indian Cobra, Vipers, Kraits are commonly found in the area. Pythons are also spotted occasionally. A variety of lizards and turtles are also found in the area.

2.8.4 Description of Major fauna reported from Ramnagar Wildlife Sanctuary :

1. ***Boselaphus tragocamelus***

Class : Mammalia
Order : Artiodactyla
Family : Bovidae
IUCN Status : Least Concerned

The **Nilgai** *(Boselaphus tragocamelus)* is the largest Asian antelope and is ubiquitous across the northern Indian sub-continent. It is the sole member of the genus Boselaphus and was described by Peter Simon Pallas in 1766. The nilgai stands 1–1.5 m (3.3–4.9 ft) at the shoulder; males weigh 109–288 kg (240–635 lb), and the lighter females 100–213 kg (220–470 lb). A sturdy thin-legged antelope, the nilgai is characterised by a sloping back, a deep neck with a white patch on the throat, a short crest of hair along the neck terminating in a tuft, and white facial spots. A column of pendant coarse hair hangs from the dewlap ridge below the white patch. Sexual dimorphism is prominent – while females and juveniles are orange to tawny, adult males have a bluish-grey coat. Only males possess horns, 15–24 cm (5.9–9.4 in) long.

2. ***Muntiacus muntjac***

Class : Mammalia
Order : Artiodactyla
Family : Cervidae
IUCN Status : Least Concerned

The **Indian muntjac** *(Muntiacus muntjak)*, also called the southern red muntjac and barking deer, is a deer species native to South and Southeast Asia. This muntjac has soft, short, brownish or greyish hair, sometimes with creamy markings. It is among the smallest deer species. It is an omnivore and eats grass, fruit, shoots, seeds, bird eggs, and small animals, and occasionally scavenges on carrion. Its calls sound like barking, often when frightened by a predator,

hence the common name 'barking deer'. It is listed as Least Concern on the IUCN Red List.

3. ***Panthera pardus***

Class : Mammalia
Order : Carnivora
Family : Felidae
IUCN Status : Vulnerable

The **Indian leopard** *(Panthera pardus)* is a leopard subspecies widely distributed in the Indian subcontinent. The species *Panthera pardus* is listed as Vulnerable on the IUCN Red List because populations have declined following habitat loss and fragmentation, poaching for the illegal trade of skins and body parts, and repersecution due to conflict situations.

4. ***Sus scrofa***

Class : Mammalia
Order : Artiodactyla
Family : Suidae
IUCN Status : Least Concerned

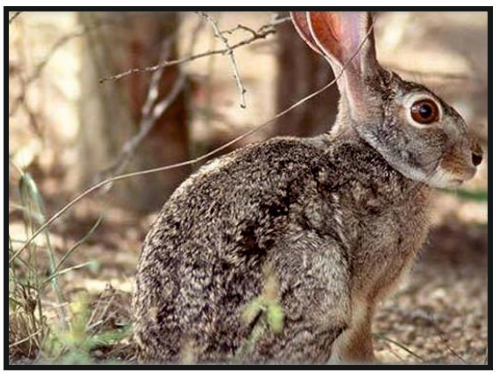
The **Indian boar** *(Sus scrofa)*, is native to India, Nepal, Burma, western Thailand and Sri Lanka. The Wild boar is an animal with an extremely wide distribution with the number of estimated wild boar subspecies ranging from 4 to 25. The wild boar is an extremely adaptable animal as it is found in a variety of different habitats, eats almost anything that will fit in its mouth and not only runs fast, but also swims well too. They are also commonly known as European wild pigs, hogs or simply Boars.

5. ***Canis aureus***

Class : Mammalia
Order : Carnivora
Family : Canidae
IUCN Status : Least Concerned

The **Golden jackal** *(Canis aureus)* is a wolf-like canid that is native to Southeast Europe, Southwest Asia, South Asia, and regions of Southeast Asia. The jackal is smaller and possesses shorter legs, a shorter tail, a more elongated torso, a less-prominent forehead, and a narrower and more pointed muzzle. The golden jackal's coat can vary in color from a pale creamy yellow in summer to a dark tawny beige in winter. It is listed as 'least concern' on the IUCN Red List due to its widespread distribution and high density in areas with plenty of available food and optimum shelter.

6. ***Lepus nigricollis***



Class : Mammalia
Order : Lagomorpha
Family : Leporide
IUCN Status : Least Concerned

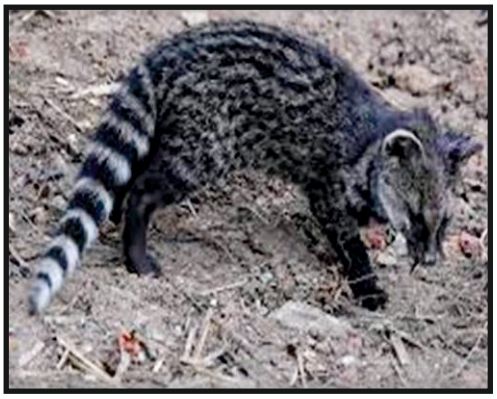
The **Indian hare** *(Lepus nigricollis)*, is native to Africa and Arabia extending into northern and central India. It has well-developed legs for leaping and running, and large eyes and ears to look for threats from its environment. Usually, a white ring surrounds the eye. It has a fine, soft coat which varies in colour from light brown to reddish to sandy grey.

7. ***Macaca mulatta***

Class : Mammalia
Order : Primates
Suborder : Haplorhini
Family : Cercopithecidae
IUCN Status : Least Concerned

The **Rhesus macaque** *(Macaca mulatta)*, colloquially rhesus monkey, is a species of Old World monkey. It is listed as least concern in the IUCN Red List of Threatened Species in view of its wide distribution, presumed large population, and its tolerance of a broad range of habitats. It is native to South, Central, and Southeast Asia and has the widest geographic range of all non-human primates, occupying a great diversity of altitudes and a great variety of habitats, from grasslands to arid and forested areas, but also close to human settlements. Species often creates menance in and adjoining populated areas, agriculture/horticulture fields, places of worship etc.

8. ***Viverricula indica***



Class : Mammalia
Order : Carnivora
Suborder : Feliformia
Family : Viverridae
IUCN Status : Least Concerned

The small **Indian civet** *(Viverricula indica)* is a civet native to South and Southeast Asia. It is listed as Least Concern on the IUCN Red List because of its widespread distribution, widespread habitat use and healthy populations living in agricultural and secondary landscapes of many range states.

9. ***Paradoxurus hermaphroditus***

Genus : Paradoxurus
Species : P. hermaphroditus
Class : Mammalia
Family : Viverridae
IUCN Status : Least Concern

The **Asian palm civet** *(Paradoxurus hermaphroditus)*, also known as **common palm civet, toddy cat** and **musang**, is a viverrid native to South and Southeast Asia. Since 2008, it is IUCN Red Listed as Least Concern as it accommodates to a broad range of habitats.

The Asian palm civet's long, stocky body is covered with coarse, shaggy hair that is usually greyish in colour. It has a white mask across the forehead, a small white patch under each eye, a white spot on each side of the nostrils, and a narrow dark line between the eyes. The muzzle, ears, lower legs, and distal half of the tail are black, with three rows of black markings on the body. Its head-to-body length is about 53 cm (21 in) with a 48 cm (19 in) long unringed tail. It weighs 2 to 5 kg (4 to 11 lb). Its anal scent glands emit a nauseating secretion as a chemical defense when threatened or upset.The Asian palm civet is thought to lead a solitary lifestyle, except for brief periods during mating. It is both terrestrial and arboreal, showing a nocturnal activity pattern with peaks between late evening until after midnight.

10. ***Vulpes vulpes***

Class : Mammalia
Order : Carnivora
Family : Canidae
IUCN Status : Least Concerned

Vulpes is a genus of the sub-family Caninae. The members of this genus are colloquially referred to as true foxes, meaning they form a proper clade. The word 'fox' occurs in the common names of species. True foxes are distinguished from members of the genus Canis, such as domesticated dogs, wolves, jackals and coyotes, by their smaller size (5–11 kg), longer, bushier tail, and flatter skull. They have black, triangular markings between their eyes and nose, and the tip of their tail is often a different color from the rest of their pelt. The typical lifespan for this genus is between two and four years, but can reach up to a decade.

11. ***Herpestes edwardsii***

Class : Mammalia
Order : Carnivora
Suborder : Feliformia
Family : Herpestidae
IUCN Status : Least Concerned

The **Indian grey mongoose** *(Herpestes edwardsi)* is a mongoose species native to the Indian subcontinent and West Asia. It is listed as Least Concern on the IUCN Red List. The grey mongoose inhabits open forests, scrublands and cultivated fields, often close to human habitation. It lives in burrows, hedgerows and thickets, among groves of trees, and takes shelter under rocks or bushes and even in drains. It is very bold and inquisitive but seldom venturing far from cover. It climbs very well. Usually found singly or in pairs. It preys on rodents, snakes, birds' eggs and hatchlings, lizards and variety of invertebrates. It breeds throughout the year.

12. ***Hystrix indica***

Class : Mammalia
Order : Rodentia
Family : Hystricidae
IUCN Status : Least Concerned

The **Indian crested porcupine** *(Hystrix indica)* is a hystricomorph rodent species native to southern Asia and the Middle East. It is listed as Least Concern on the IUCN Red List. It belongs to the Old World porcupine family, Hystricidae. Indian crested porcupine is a large rodent weighing 11-18 kg. Their body (from nose to the base of the tail) measures between 70 - 90 cm with the tail adding an additional 8-10 cm. The life span of wild Indian crested porcupine is unknown, but the oldest known captive individual was a female that lived to be 27.1 year old.

13. ***Bungarus caeruleus***

Class : Reptilia
Order : Squamata
Suborder : Serpentes
Family : Elapidae
IUCN Status : Threatened

The **Common Krait** *(Bungarus caeruleus)*, also known as the blue krait, is a species of highly venomous snake of the genus Bungarus native to the Indian subcontinent. It is a member of the "big four" species, inflicting the most snake bites on humans in

Bangladesh and India. This common krait is distributed from Sindh to West Bengal, throughout South India and Sri Lanka at elevations up to about 1,600 m (5,200 ft).[1] It has also been recorded in Afghanistan, Bangladesh, and Nepal. It lives in a wide variety of habitats, from fields and low scrub jungle, as well as settled areas. It rests in termite mounds, brick piles, rat holes, even inside houses. It is frequently encountered in water or in proximity to a water source.

14. ***Naja naja***

Class : Reptilia
Order : Squamata
Suborder : Serpentes
Family : Elapidae
WPA Status : Protected

The **Indian Cobra** *(Naja naja)*, also known as the spectacled cobra, Asian cobra, or binocellate cobra, is a species of the genus Naja found, in India, Pakistan, Bangladesh, Sri Lanka, Nepal, and Bhutan, and a member of the "big four" species that inflict the most snakebites on humans in India. It is distinct from the king cobra which belongs to the monotypic genus Ophiophagus. The Indian cobra is revered in Indian mythology and culture, and is often seen with snake charmers. It is now protected in India under the Indian Wildlife Protection Act (1972). It is placed in CITES Appendix-II.

15. ***Python molurus***

Class : Reptilia
Order : Squamata
Family : Pythonidae
IUCN Status : Near threatened

Rock python *(Python molurus)* is a large, non venomous python species native to tropical and subtropical regions of the Indian subcontinent and Southeast Asia. The rock python's color pattern is whitish or yellowish with the blotched patterns varying from tan to dark brown shades. This varies with terrain and habitat. *P. molurus* occurs in India, southern Nepal, Pakistan, Sri Lanka, Bhutan, Bangladesh, and probably in the north of Myanmar. It lives in a wide range of habitats, including grasslands, swamps, marshes, rocky foothills, woodlands, open forest, and river valleys. It needs a permanent source of water. Like all snakes, Indian pythons are strict carnivores and feed on mammals, birds, and reptiles indiscriminately, but seem to prefer mammals. Oviparous, up to 100 eggs are laid by a female, which she protects and incubates. The Indian python is classified as lower risk/near threatened on the IUCN Red List of Threatened Species.

Pictures of Prominent Fauna of Ramnagar Wildlife Sanctuary

Leopard

Neelgai

Small Indian Civet

Indian Procupine

Wild Boar

Indian Muntjac

(Photo Credit: Department of Wildlife Protection J&K)

Prominent Birds of Ramnagar Wildlife Sanctuary

Lesser Golden-backed woodpecker

Shikra

Himalayab Bulbul

Bulbul Red-Vented

Laughing Dove

Rose-ringed Parakeet

Purple Sunbird (female)

Yellow-footed Green Pigeon

Purple Sunbird (Male)

Jungle Babbler

Eurasian collared Dove

Asian koel

Black drongo

Oriental Turtle Dove

Brwon headed barbet

Rock pigeon

Indian Grey hornbill

Rufous treepie

Green Bee-eater

Indian white eye

Eurasian Hoopoe

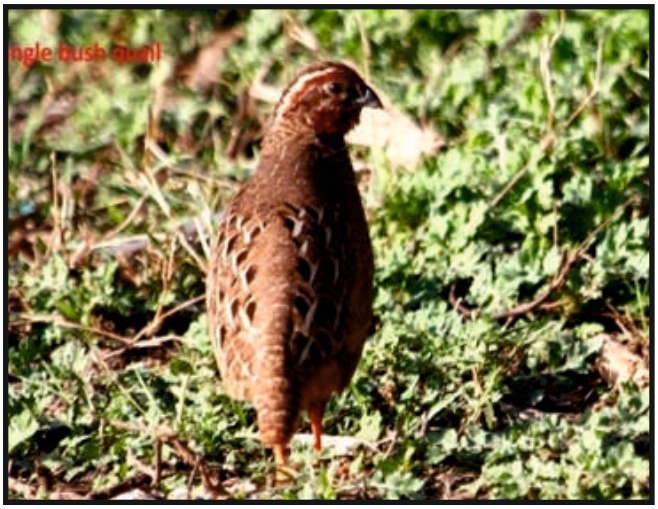
White browed wagtail

Black Kite

Sind sparrow

Indian Peafowl

Common Myna



Jungle bush quail

Egyptain vulture

Slender billed vulture

White backed vulture

Indian eagle-owl

Red Jungle fowl

Prominent Reptiles of Ramnagar Wildlife Sanctuary

Monitor lizard

Banded kukri Snake

Common krait

Rat Snake

Water snake

Python

Black Cobra

Spectacled Cobra

Sand boa

Indian wolf snake

Russel viper

Cat snake

Royal snake

Trinket Snake

(Photo Credit: Department of Wildlife Protection J&K)

Common Butterflies found in Ramnagar Wildlife Sanctuary

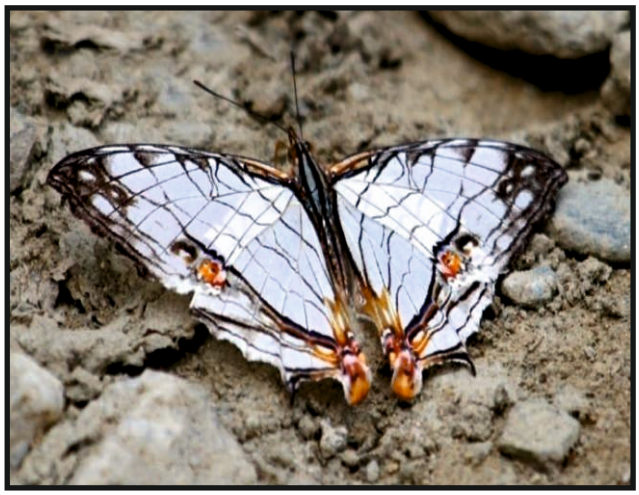
Acacia blue

Blue tiger

Bamboo tree brown

Common crow

Common lascar



Common map

(Photo Credit: Dr. Neeraj Sharma)

CHAPTER - 3
HISTORY OF MANAGEMENT AND PRESENT PRACTICES

3.1 General:

The Maharaja of the erstwhile state established the area on a Private Rakh under the Game Preservation Act 1942 and named it after the Ramnagar ridge. To ensure the availability of shooting for his favorite pastime the Maharaja has enforced strict game laws. These laws covered all areas (game reserve or rakhs) where hunting was permitted seasonally and controlled.

Some game guards were deputed to police and patrol the reserve and penalty for poaching was very severe. The Ramnagar Wildlife Sanctuary was notified as Wildlife Sanctuary by the J&K Government vide SRO 136 dated 10/04/1990. The Sanctuary covers an area of 31.5 sq.km as per the SRO. The area comprises of demarcated forest and is roughly wedge shaped.

For protection and control of wildlife in the erstwhile state of J&K rules and regulation were passed in the form of the Jammu & Kashmir Games Preservation Act 1998 (1942 A.D), Act No. XXIV of 1998. Thereafter with a few to protect and preserve the wildlife the Jammu & Kashmir Wildlife Protection Act 1978 was passed by the state legislator. Till the 31st Oct 2019 the wildlife protection activities guided under this act. After the Re-Organization Act 2019 the Indian Wildlife Act 1972 got its implementation in the UT of Jammu and Kashmir.

The sanctuary is surrounded by city of Jammu which is densely populated and expanding very fasting with new areas are coming up under the constructions/habitation as people from all over the union territory are migrating and settling at Jammu.

A comparative study of phyto-diversity shows that this small patch of forest is much more diverse and richer than surrounding forest areas of Jammu. The faunal species, some of which include Leopard, Barking deer, Wild boar, Nilgai, Porcupine, Red jungle fowl, Peafowl, Python, Russell viper, Cobra owe their existence and protection to this patch of wildlife protected area.

The best time in the year to visit is March-April or September to March because these are the months when birds and animals of this beautiful Sanctuary come out and the view is remarkable.

3.2 Review of Past Management:

There is no Approved Management Plan for Ramnagar Wildlife Sanctuary. However, a Management Plan for 2011-12 to 2015-16 was drafted by Wildlife Division Jammu but was not approved by the competent authorities.

Following were the objectives of draft management plan 2011-12 to 2015-16:

I. To conserve and protect the lower Shivalik biodiversity including threatened and endangered species of flora and fauna along with their habitats.
II. To protect the catchment areas of all the nallahs originating within Wildlife sanctuary.
III. To minimize conflict between the local people and wildlife and maintain a ecological harmony and ecosystem stability.
IV. To reduce local people dependency on the natural resources of the PA and enhance enterprise-

based livelihood opportunities without changing the traditional and cultural values.

V. To restore the areas degraded due to biotic pressure by minimizing grazing/fire and weed spread.

VI. To evolve a system of participatory Wildlife Sanctuary management and promote long term research and monitoring of endangered species and their habitat.

VII. To conserve roosting/nesting sites of vultures by monitoring, minimizing the use of banned drugs in and around the sanctuary.

VIII. To maintain existing water holes and creating new sources in water deficient areas.

IX. To maintain and strengthen protection measures against poaching, forest fires, illegal and destructive collection of forest produce, encroachments, cattle disease, illegal fishing etc.

X. To promote /conduct research, studies, investigations activities in order to promote better scientific management of the area.

XI. To maintain and increase appropriate interpretation and conservation education facilities, for awareness and education of people, especially the local population to solicit their support in conservation of the wildlife and biodiversity of the area.

3.3 Major management activities:

3.3.1 Plantation: In fringe areas and in open blanks which are degraded and deforested are being rehabilitated by plantation of suitable species of local plants preferably fruit bearing and fodder species. These activities are required to be taken up as per site requirement and species to be planted to be finalized very carefully, keeping in view the animal requirement in the area. Planted saplings require proper protection from wild animals as well as domestic animals.

Table 3.1 Plantation activities in Ramnagar Wildlife Sanctuary (2015-16 to 2019-20)

Year	Scheme	Compartment No.	Saplings (in No.)
2015-16	CAMPA	Co.1/R and 3/R	15000
	CSS	Co.2/R	2000
2016-17	CAMPA	Co.1/R and Co.4/R	13000
	CAPEX	Co.1/R and 2/R	1500
2017-18	CAMPA	Co.1/R, Co.2/R Co.3/R Co.4/R	6800 No.
	CAPEX	Co.1/R	820
2018-19	CAMPA	Co. 1/R-to 4/R & 1/P	7000 No.
	CSS	Co. 1/R-to 4/R & 1/P	2000
2019-20	CAMPA	Co. 1/R-to 4/R & 1/P	9500

3.3.2 Anti-poaching activities: Wild animals are always under constant threat of poaching. Poaching is done by people for protection of their crops, live-stock, game hunting and occasionally for trade in wild animal derivatives or their body parts. The department is fighting vehemently against

theses poachers. Constant vigil requires to be kept on these poachers. Watch towers are being erected inside protected area near water holes and at vital places. Establishment of anti poaching posts adjacent to protected area and with deployment of Informers inside and adjacent to protected area will help to nab the culprits. Sometimes poacher took advantage of feeble legal process against them; cases against them are to be fought properly by engaging legal counsels departmentally. Most important factor to strengthen the anti-poaching operations against poachers is the mobility in and outside protected area and a close liaison with police, courts and with anti poaching squads, informers for surprise raids and timely results.

In Ramnagar Wildlife Sanctuary except for illegal grazing, unsettled rights and few cases of tree felling/lopping, other illegal activities are under check and control so far. The department regularly appeals to the public not to kill/endanger wild animals. The field staff regularly conducts patrolling of the area to check any illegal activity. However, staff is required to be further strengthened to increase the frequency of patrolling in the fringe areas along with camping in the sensitive areas in the odd hours so that complete check could be maintained. Moreover, input generation of information by way of local support/enagagement of informers is required to be strengthened.

Table 3.2 Detail of hunting cases since 2015-16 in and around Ramnagar Wildlife Sanctuary

S.No.	Year	No. of Cases	Name of Species hunted
1	2015-16	Nil	-
2	2016-17	Nil	-
3	2017-18	Nil	-
4	2018-19	Nil	-
5	2019-20	Nil	-

3.3.3 Habitat Improvement activities: The Wild habitats are always subjected to degradation through biotic and abiotic interferences. The natural calamities like floods, forest fires, thunders, lightening, and drought are some natural miseries but man's greed in the form of poaching, tree felling, encroachment, diversion of Wildlife area for agricultural practices, annihilates the Wildlife and its habitat. These detrimental activities are to be arrested by initiating some management interventions. The protected area requires some soil conservation activities like Dry Rubble Stone Massonary works (D.R.S.M), gully plugging works to contain top soil run-off by way of vegetative structures, concrete check dams, crate works etc. The degraded habitats are to be rehablitated by way of plantation of fruit bearing plants, patch showing, planting of grass slips, dibbling and treatment of land slide areas with soil binding species.

The Wildlife habitats are to be protected against devastating forest fires which sometimes engulf chunk of wildlife areas and even perishes precious wild animals. The clearance of old fire lines, besides making of new fire lines is a must in the protected area. Skilled labours are to be engaged in the fire protection squads. The fire-control equipments like jig-saw, Shovels, Helmets, Gas-Cartridges, Recks etc are to be purchased to extinguish the forest fires in time. Participation of the local people is to be given

top priority as in many cases local tribals turned fruitful in dousing forest fires before Government agencies could reach the area. Weed infestation had caused the depletion of local grasses and shrubs, therefore require special attention and management practice to revive the degraded grass lands. The large area of the Sanctuary is infested with weeds like *Lantana* and *Parthenium*. Although, the *Lantana* provides shelter to many animals but have negative impact on natural grasslands. The natural grasslands are also infested with *Parthenium* which is a challenge for management. There are very few open blanks in the Ramanagar Wildlife Sanctuary except in the landslide areas and areas degraded due to accessive grazing by the nomads. These areas are covered with lantana and parthenium weed, therefore habitat improvement activities should be concentrated and scientific approach is to be adopted to rehablitate the area.

3.3.4 Weed Removal: The large area of the Sanctuary is infested with weeds like *Lantana* and *Parthenium*. Although, the *Lantana* provides shelter to many animals but have negative impact on natural grasslands. The natural grasslands are also infested with *Parthenium* which is a challenge for management. The weed removal has been proposed to be continued activity to be taken up regularly along with rehabliattion of weed eradicated area by way of plantation of fast-growing fruit and fodder species and grass slips of native species.

Table 3.3 Removal of Lantana in Ramnagar Wildlife Sanctuary (2015-16 to 2019-20)

Year	Scheme	Comptt. No.	Area treated (in Ha)
2015-16	CAMPA	Co. 1/R - 4/R	30 Ha
2016-17	CAMPA	Co. 1/R - 4/R	20 Ha
	CAPEX	Co.1/R - 3/R	10 Ha
2017-18	CAMPA	Co.1 - 4/R	23 Ha
	CSS	Co.1 - 4/R	5 ha
2018-19	CAMPA	Co.1 - 4/R	22 Ha
	CAPEX	Co.1 - 2/R	2.5 Ha
	CSS	Co.1 - 4/R	10 ha
2019-20	CAMPA	Co.1 - 4/R	18 Ha
		Co.2/R	2 Ha

3.3.5 Forest Protection: Boundaries of Ramnagar Wildlife Sanctuary are demarcated. West and Southward of the sanctuary is Jammu city (constructed area) and is covered by way of boundary wall and chain link fencing. Northern boundary of the sanctuary is shared by Keran Walli Rakh which is a forest area continuous with Sanctuary Forest. Towards the east the boundary of the sanctuary is shared with Khanpur and Jagti private habitations where proper demarcation and appropriate fencing is required. Since, some of the notified area of the sanctuary i.e., Co. 2/P, 3/P and some part of Co. 1/P and 3/R is still with the Territorial Forest Department, which is required to be taken over and further fencing and demarcation is required to be immediately done. Towards the south of the sanctuary is

River Tawi where demarcation is done by way of installation of boundary pillars. Demarcation of the sanctuary boundary and fixing of boundary pillars is required to be completed during the plan period so that any further encroachment could be identified and arrested in time.

3.3.6 Construction of Inspection paths/Patrolling routes: For the effective monitoring of the sanctuary and patrolling of the area, different patrolling paths has been constructed by the department which are being maintained regularly in order to keep them walkable. A 3.0 Kms nature/Bird watching trail has been constructed within the Ramnagar Wildlife Sanctuary in Co.1 and Co.4 for the bird watching and patrolling with having different facilities like view points, sheds etc. This trail is also being used by the inhabitants of the surroundings areas for morning and evening walk.

3.3.7 Development of Water holes: Water holes are constructed with in the Sanctuary for providing water facility to the wild animals living within as well as outside the Sanctuary area. Keeping in view the water scarcity in the area a rationale approach is required to adopted while deciding the location of the area for construction of water holes. It has been observed that in few compartments there is no water hole and in few compartments water holes are constructed very close to each other.

Table 3.4 Construction of Water holes in Ramnagar Wildlife Sanctuary

S.No.	Type of Water body	Source	Location	Geo-coordinates
1	Pacca pond	Leakage of water supply pipe	Co. 1/P	N 32° 46' 21.72'' E75° 51' 50.62''
2	Pacca pond	Rain water	Co. 1/R	N 32° 45' 55.41'' E75° 52' 15.30''
3	Pacca pond	Leakage of water supply pipe	Co. 1/R	N 32° 45' 07.59'' E75° 52' 00.80''
4	Pacca pond	Leakage of water supply pipe	Co. 1/R	N 32° 45' 06.44'' E75° 52' 13.08''
5	Pacca pond	Leakage of water supply pipe	Co. 1/R	N 32° 45' 55.26'' E75° 52' 13.63''
6	Kaccha pond	Water overflow	Co. 1/R	N 32° 45' 02.10'' E75° 52' 10.48''
7	Pacca pond	Water connection	Co. 1/R	N 32° 45' 42.08'' E75° 52' 19.95''
8	Kaccha pond	Leakage of water supply pipe	Co. 1/R	N 32° 44' 59.40'' E75° 52' 00.01''
9	Pacca pond	Leakage of water supply pipe	Co. 1/P	N 32° 45' 08.17'' E75° 52' 02.77''
10	Kaccha pond	Rain water	Co. 4/R	N 32° 45' 46.48'' E75° 51' 43.54''
11	Pacca pond	Rain water	Co. 4/R	N 32° 45' 35.47'' E75° 51' 36.31''
12	Pacca pond	Rain water	Co. 4/R	N 32° 45' 33.67'' E75° 51' 37.30''

3.3.8 Construction of observation posts/watch towers: Watch towers and observation posts are very important for the management and monitoring of the wildlife in any protected area. Two Watch towers merged with the surroundings are constructed in the Ramnagar wildlife sanctuary in Co.1/R & Co.4/R to observe the animals undisturbed in the natural habitat. These watch towers are of great help while conducting census and survey or studying the animal behavior in their natural habitat. These are also being used for effective watch and ward of the area. There is need for more such watch towers in other compartments preferably at the top locations of Co.2/P and Co.3/P. Exact location of these watch towers can be finalized with active consultation with field staff.

3.3.9 Construction of infrastructure for field staff: In order to manage the area effectively field staff is required to be facilitated and proper accommodation is to be provided. Guard huts in four beats have been constructed, guard hut of Khanpur need immediate repair so that it can be put to re-use. Moreover, three more guard huts which are required for the effective management of the area are proposed one each at Kamala, Roopnagar and Chinore area.

3.3.10 Soil & Water Conservation measures: The soil conservation work is being carried out throughout the Sanctuary in erosion prone areas. The Sanctuary falls under lower Shivalik zone and is characterized with recent zoological formations and is prone to erosion and slides.

In order to check soil erosion following works are being regularly carried out in the sanctuary.

- Construction of check dams.
- Gully plugging by way of DRSM structures/Biological structures.
- Nallas training works.
- Land slide control.
- Catchment area treatment works

Table 3.5 Soil Conservation Works in Ramnagar Wildlife Sanctuary

Year	Scheme	Comptt No.	DRSM (in Cum)	Ponds (in No.)	Crate Work (in nos.)
2017-18	CAMPA	Co.1 - 4/R	290 cum	—	—
	CSS	Co.3/R & -1/P	30 cum		
	CAPEX	Co.2/R & -3/R	25 cum	—	—
2018-19	CAMPA	Co.1 - 4/R	410 cum	—	30
	CAPEX	Co.1 - 4/R	250 cum	—	5
	CSS	Co.1 - 4/R	—	—	30
2019-20	CAMPA	Co.1 - 4/R & 1/P	360 cum		43
	CAPEX	Co.1 - 2/R	120 cum		

3.3.11 Wild animal rescue operations: Wild animals came in conflict with humans either inside the protected area or outside the protected area causing danger to human life as well as to the animal. In such cases for the safe rescue of the animals the rescue teams from the Control room Manda came to

action and rescue the animal safely and release it in wild away from humans as well as habitations to avoid further such incidents. Rescue teams of Manda are working on 24x7 for such operations. Due to increase in the frequency of such incidents when the animals from the protected area are entering the adjoining city/habitations, Control room Manda is required to be strengthened with experienced man power and latest rescue equipments.

3.4 Dependency on area:

3.4.1 NTFP (Non-Timber forest produce): Sanctuary is surrounded from three sides by the habitations of Jammu city and villages. The population of villages is mainly dependent on agriculture for their livelihood. The forest dependency is mainly for the collection of firewood, collection of minor forest produce like myrobalans, wild fruits etc and grazing of their cattles.

3.4.2 Nomadic Livestock Grazing: As the winter approaches, the Gujjar and Bakarwal tribes migrate from the hills to the sanctuary every year. They construct temporary shelters locally called 'dhoks' and stay in the sanctuary till summer arrives. Their livestock feeds on the flora available in the sanctuary therefore, causing shortage of forage for the resident wildlife. Moreover, routine practices like washing and bathing adopted by the nomads further worsen the scenario. The leaf litter and worn out twigs of plants are removed from forest floor as a source of fuel, for heating houses and cow sheds during winter months and as manure. This practice brings about changes in physicochemical properties of soil by halting the process of decomposition. Moreover, in Kandi areas, it disturbs the ground water regime, as this thick layer of sponge (litter) is removed periodically. The soils are washed away in gullies during monsoon months. Interference of the nomads (Gujjar/Bakarwals) and nearby residents has been noticed in the sanctuary. Both the grazers and browsers owned by the nomads are left in the forest in the morning for the whole day which has found to cause great damage to the herbaceous flora of the sanctuary.

Excessive lopping of the species like *Acacia modesta, Acacia catechu, Bauhinia variegata, Butea monosperma, Grewia optiva, Ficus palmata* and *Leucaena leucocephala* is done by nomads for rearing their goats, horses and sheep which has resulted in excessive biotic pressure to the area. The removal of branches is also performed by people of poor community living near by the sanctuary premises for meeting the level of fuel wood. The heavy lopping weakens the physiological processes of tree. The trees along the sanctuary fringes are found weaker, stunted and exposed to diseases and fungal attacks. Moreover, excessive looping adversely affects the production of fruits and seeds, and also poses a negative impact on regeneration. Subsequently, lopping reduces the density of the forest and exposes the soil to erosion causing a major chance for spread of weeds within the sanctuary and has potential to transmit livestock diseases to wild animals.

3.4.3 Domestic livestock grazing: Available stretches of grass lands in the Sanctuary are still being used by villagers for cattle grazing. Number of nomads alongwith their cattles undergoes grazing inside the sanctuary mostly in Co.2/P, 3/P and 3/R. Thus, increasing the cattle pressure on the sanctuary.

Such unregulated grazing may cause spread of many communicable diseases to the wildlife,

habitat disturbance, competition for the feed to the wild animals of the Sanctuary. Therefore, proper check is required to be maintained in the fringe areas so that a minimum inviolate area could be maintained for the wild animals of the area, also stall feeding to domestic animals could be promoted in the fringe villages. Keeping in view the small area of the sanctuary these nomads are required to be shifted out of the sanctuary, so that disturbance to the wild animals could be avoided. However, there are directions from the Hon'ble High Court, J&K, Jammu for shifting of these nomads from the sanctuary area, compliance is required to be made during the plan period.

3.4.4 Fire wood collection: The villagers and migratory labourers living adjoining to the area collect fire wood from the sanctuary. However, it has been observed that this dependency has reduced to some extent due to change in the life style of the people living around. The local labour class and nomads are still using the traditional firewood chulahs for cooking purpose. Department has not maintained any record of such people who are using firewood, which is required to be recorded and quantification of firewood collected should be done. Therefore, it is proposed to aware these people regarding the harms of these chulahs and they should be provided with some alternative appliances so that they could gradually shift towards eco-friendly cooking options like LPG, electric and solar appliances etc.

3.4.5 Morning walkers: Walking tracks in the sanctuary have fragmented the forest as well as animal population. Since, the Ramnagar Wildlife Sanctuary is located in the vicinity of Jammu city, number of people go for morning and evening walk in the sanctuary in an unregulated manner. Early morning walks also disturb animal activities when wild animals go for feeding. Moreover, leopard has also shown its presence in the area, therefore, morning walkers should avoid walk in the sanctuary. To ascertain impact of morning walking on wildlife and Ramnagar Wildlife Sanctuary, ecology study has to be conducted keeping carrying capacity as one of its objectives. There is requirement to work out some alternative route for the morning and evening walkers so that disturbance to wild animals could be minimized and risk to people life could be avoided. The national highway and the link road passing through the sanctuary is also being used by the locals for walk, therefore, it could be one of the suitable alternative and it will help in getting the wild animals sufficient inviolate area.

3.5 Current Land use Practices and Problems:

3.5.1 Agro-Pastoralism: The Ramnagar Wildlife Sanctuary is surrounded by the settlements of Janipur and Shangan on the west side and Khanpur village on the Eastern side. The residents are mainly farmers and their agricultural lands extend right up to the boundaries of the sanctuary. There are few permanent settlements on the southern side very close to the sanctuary. Constant vigil by the field staff has been kept to prevent any intrusion but in the absence of a reliable fencing, the threat of encroachment looms large.

The area experiences enormous grazing pressure during winter season from the domestic cattles, sheeps and goats owned by the nomads. Owing to the ever-increasing livestock population, grazing pressure on the sanctuary is immense. The extent of grazing is far beyond carrying capacity of sanctuary and is adversely affecting the natural regeneration of the forests. The over grazing results in degradation

of the habitat, distruction of germinating trees, shrubs and grasses and threat to wild animals. There are various types of nomadic grazier communities called as nomadic tribes who move along with their herds of livestock from sub-tropical winter grazing areas to high altitude pastures in summer. These include Gujjars, Barkarwals, Gaddis, Dodhi Gujjars and Chaupans. Livestock grazing by nomadic communities is a socio-economic issue as well.

3.5.2 Forest Fires: Forests fires are global phenomenon and cause extensive loss to biodiversity. Forest fires are seasonal and they usually start in the dry season. Owing to the long spell of dryness during the summer and autumn season (April-June and November-December) the dried-up grasses and leaves are prone to natural and manmade fires which cause damage to forests and wildlife.

Activities like regular patrolling of sensitive areas, construction of fire lines, cleaning and clearing the road side areas from dry leaves and inflammable material, installation of watch towers, engagement of fire watchers, informers are being carried out by the department to reduce the chances of forest fires and also reduce the negative effects of forest fire. Constant vigil and preventive measures adopted by the department has resulted in zero fire incidences in last 5 years.

Table 3.6 Fire incidents since 2015-16 in Ramnagar Wildlife Sanctuary

S.No.	Year	Date of Offence	Location/ Comptt	Area Burnt	Remarks
1	2015-16	-	Nil	-	No such case reported
2	2016-17	-	Nil	-	No such case reported
3	2017-18	-	Nil	-	No such case reported
4	2018-19	-	Nil	-	No such case reported
5	2019-20	-	Nil	-	No such case reported
6	2020-21	-	Nil	-	No such case reported

Fire line : Various fire lines/inspection paths are made in the Ramnagar Wildlife Sanctuary.

Table 3.7 List of Fire lines since 2015-16

S.No.	Year	Name of fire line	Length in KM	Remarks
1	2015-16	Co.1 - 4/R	2 kms	
2	2016-17	-	-	
3	2017-18	Co.1 - 4/R	10 kms	
4	2018-19	Co.1 - 4/R & 1/P-	10 kms	Maintenance
5	2019-20	Co.1 - 4/R	13.67 kms	Maintenance

3.5.3 Dumping of Waste Material: Developmental activities have led to increased garbage

dumping outside the city, mostly along the roads passing through the Sanctuary resulting in increase in population of monkeys and stray dogs. The increase in their population lead to man-animal conflicts and also they attract the leopard, as they are easy prey for them. Although no such incident has been reported so far but such possibilities cannot be overruled. Hence, department needs to check the illegal dumping of hotel and residential eatable residues and other waste material in and around the sanctuary. Number of cases of dumping of construction material, garbage/hotel refuse in the nallahs of the sanctuary is reported. Moreover, the incidences of dumping of construction and other wastes inside the sanctuary are being reported along the national highway and link road during odd hours/night times due to non-availability of proper check posts. It is therefore proposed to establish two ckeck posts at the entrance of the sanctuary near Manda and Panjtirthi with sufficient staff deployment so that round the clock vigil on the movement of vehicles could be maintained. Also night patrolling on the roads is required to be made a regular practice. Open areas along the highway are required to be fenced, installation of proper display broads and installation of camera traps on the sensitive areas so that regular check is maintained.

3.5.4 Hit and Run Cases on the roads passing through Sanctuary: National Highway NH-44 passes through the sanctuary while the physical footprint of the high way is around 15 kms, the *ecological footprint* of the road ex-tends much further. Direct affects of roads include road mortality, habitat fragmentation and loss, and reduced connectivity. Severity of these effects depends on the ecological characteristics of a given species and direct road kill.

Road cause habitat fragmentation because they break large habitat areas into small, isolated patches which support few individuals. These small populations lose genetic diversity and are at risk of local extinction. In addition to these obvious effects, roads create noise and vibration that interfere with ability of reptiles, birds, and mammals to communicate, detect prey, or avoid predators. Roads also increase the spread of exotic plants, promote erosion create barriers and pollute water sources.

Despite there being norms of speed limits for the vehicles, number of cases of hit and run are witnessed resulting in the death of wild animals including monkeys, Indian monitor lizard, Indian mongoose, cobra etc. It is proposed that speed breakers, animal crossings and speed limit signages, animal under passages are required to be installed/constructed along both the roads crossing the sanctuary. Strict enforcement of speed limits through various means by taking onboard Highway Authorities are very crucial.

3.5.5 Manda deer park and Visitors therein: A small deer park and rescue centre has been established at Manda where different rescued animals are kept. The deer park/ Rescue center at Manda has tremendous tourism potential. The rescue center has number of mammals' species like Cheetal/Spotted Deer, Sambar, Barking deer, Leopard, Bear, Nilgai and many bird species like peafowl, eagles, owls etc. The average number of visitors is around 1.5 lakh yearly. A Nature Interpretation Centre has been constructed for the awareness programs regarding Wildlife conservation which is proposed to be upgraded with basic facilities and equipment. Different programmes for the awareness regarding wildlife and biodiversity of the area to the general public as well as students are required to be organized on a regular basis. The infrastructure of Manda deer park including enclosures, display

boards, judicious tapping of leakages from PHE reserviour is required to be improved. Enclosures are required to be developed and extened as per CZA designs and guidelines.

3.5.6 Development Activities: The Ramnagar Wildlife Sanctuary is in the vicinity of Jammu city and is surrounded by villages and suburbs from all the sides; the sanctuary is almost like an island of biodiversity in the concrete surroundings. The development activities like construction of buildings, development of roads, electric lines, increase in vehicular movement in the surroundings of the sanctuary has put a lot of pressure on fragile ecosystem and the wildlife of the area.

3.5.7 Climate Change: It is a well-known and established fact that the climate change has a net negative impact on the flora and fauna of the area. It directly affects the wildlife in the form of high temperature, high wind speed, torrential rains, high intensity forest fire, etc.

Torrential rains cause flash floods in the nallahs present in the sanctuary, leading to uprooting of the trees, soil erosion, damages to plantations and soil moisture conservation works such as bunds, crates etc. Spread of weeds in the sanctuary could also be the result of climate change needs to be scientifically studied.

3.5.8 Human-Animal Conflict: Most of the cases of the human animal conflict in and around the Ramnagar Wildlife Sanctuary are about attack by Monkeys, snakes entering habitations and damage of crops by wild boar. Monkey menace is almost reported from all fringe areas of city bordering sanctuary. The incidences of monkeys attacking people are as a result of feeding to monkeys by the locals and tourists along the roads and when they do not get food, they snatch packets from passerby, in that act people get injured.

Many tourists and the local residents feed monkeys on roadside, which has changed the habits of monkeys, they have become almost like beggars and that can be witnessed along the roadside. The department is trying its best to stop feeding but because of lack of adequate staff strength incidents of feeding are still taking place. Again, major cause of death of monkeys in road accidents is mainly because of the feeding by tourist and local residents. People travelling in cars throw food on roads and monkeys while crossing the road to collect those food items get accidently killed by the cars and other vehicles. Movement of leopards and other herbivore animals outside the sanctuary area and in the habitations has also been noticed which poses a great threat to humans as well as wildlife.

3.5.9 Wildlife Health: A small veterinary unit is established at Manda with a single Veterinary Officer who is looking after the injured/ sick wild animals brought from all over the Jammu province. Due to increase in conflict incidents the work load and pressure on Veterinary Unit has increased manifold. There are some diseases which can be propagated to wild animals from the domestic animals therefore, proper vaccination of the domesticated animals by the Animal Husbandry Deptt. is required to be regularly done so that wild animals can be prevented from spread of such diseases. Department is required to regularly fallow the matter with Animal Husbandry Department for vaccination of all domestic animals living along the fringes of protected area particularly among nomads.

3.5.10 Disputed public and private infrastructure: There are number of private and Govt. structures existing inside the notified boundary of the protected area which are disputed and their rights and titles are required to be settled under the relevant provisions of the Wildlife Protection Act 1972.

These constructions are existing prior to the notification of the area as wildlife sanctuary.

Even there are some areas of the sanctuary which are under the possession /occupation of Army/ Govt. Departments. Complete mapping of the all these structures/assests has been done. Process driven timely settlement of these disputes is required to be taken up on priority basis so that time bound decision could be taken in this record.

3.5.11 Infrastructure: Infrastructure required for manning the sanctuary area properly is not upto the mark and is required to be improved with construction of guard huts in beats where these are not available and proper communication facilities are required to be provided to the field staff so that day and night patrolling could be done effectively and management of the area could be improved. There is requirement for maintenance of patrolling paths so that the field staff could move in the area freely and even research activities can be promoted.

Detail of infrastructure available in the sanctuary is as under: -

Infrastructure includes Range Office, Chowkidar Hut, Guard Hut, Inspection Hut, Control Room and Rescue Centre.

Building Details: -

S.No.	Building Name	Geo-refrences
1	Range Office, Manda Jammu	N32 45 01.42 E 74 52 08.01
2	BO Hut Sitlian	N32 45 01.42 E 74 52 08.01
3	Guard Hut Dountaly	N32 45 01.42 E 74 52 08.01
4	Guard Hut Janipur	N32 45 01.42 E 74 52 08.01
5	Guard Hut Sitlian	N32 45 01.42 E 74 52 08.01
6	Guard Hut Khanpur	N32 45 01.42 E 74 52 08.01
7	Inspection Hut Manda Jammu.	N32 45 01.42 E 74 52 08.01
8	NIC Manda Jammu	N32 45 01.42 E 74 52 08.01
9	Veterinary unit	N32 45 01.42 E 74 52 08.01
10	Manda Control Room	N32 45 01.42 E 74 52 08.01
11	Rescue Centre/Manda Deer Park	N32 45 01.42 E74 52 08.01

3.5.12 Roads: There are three roads inside the Sanctuary:

1.	NH Jammu –Srinagar	7 Kms
2.	Link road Panjtirthi to Sidhra/Sitlian.	5 Kms
3	High court to Kamala (used by army/wildlife staff)	2 kms

3.5.13 Vehicles: For the effective management of the area there is required effective conviance and communication facilities to the field staff. At present, there is one Bolero, two pick up vans and four bikes and are being used extensively for management of wildlife in the division. There is requirement of one more pickup van for the range officer and 3 motocyles for field staff for the effective management of the protected area.

3.5.14 Communication: An effective tele-communication is highly essential for timely information and response. Construction of patrolling paths in the areas where there is more biotic interference and provisioning for providing smart phones to the field staff is proposed.

Postal Address:

Wildlife Warden Wildlife Division Jammu -181101 Telephone No. 0191520223 Email address: wlwjammu@gmail.com	Range Officer Wildlife Range Jammu-181101 Email address:

3.5.15 Training: The present staff has undergone only limited form of training in Wildlife management, use of advanced equipments like GPS, Camera traps etc and maintenance and use of firearms and wireless. The lack of trained staff seriously affects the Sanctuary management. Department has to organize regular workshops and training for the capacity building of the field staff.

3.5.16 Research monitoring and training: The Research in Wildlife and Forest Ecology is being carried by the different agencies including Department of Zoology, Botany and Environmental Sciences, University of Jammu. Well organized research on biological and socio-economic aspects helps in arriving at appropriate management decisions. A few ecological studies and floral and faunal surveys conducted in Sanctuary by different departments have helped in basic understanding of the Sanctuary. However, several long term and short term studies are yet to be carried out in the Sanctuary.

3.5.17 Administrative set up: Presently, Ramnagar Wildlife Sanctuary is one of the administrative units of Wildlife Division Jammuand is under the overall management of Wildlife Warden Jammu. Sanctuary is managed by Range Officer, Ramnagar with headquarter at Ramnagar who is assisted by 3 Foresters stationed at Ramnagar. Day-to-day activities and protection of Sanctuary is being carried out through Wildlife Guards, watchers and Need based labourers. Manda Rescue centre and Control room is administered by a separate Range officer who is assisted by two block officers and forest guards and watchers etc.

3.5.18 Patrolling and protection: Main focus of the patrolling is anti-poaching, anti-grazing activities and fire control measures. Fencing of the planted areas close to the fringe villages. Routine patrolling is being done by available field staff. Inspection paths are constructed in the sanctuary which are being used in the patrolling of the area. Anti- poaching and fire watchers are engaged to strengthen the protection of the Sanctuary.

3.5.19 Education and Awareness: Awareness of general public regarding existing bio diversity of

the area and its ecological significance plays an important role in its conservation and protection. Therefore, awareness programmes / Wildlife Week celebration etc are being conducted in the nearby schools and villages on regular basis. Hoardings / publicity boards displaying information on wildlife and about the Sanctuary are installed at prominent places in and around the sanctuary for public awareness. There is need for taking these drives regularly in the fringes of the sanctuary to sensitize the locals. Also, sufficient hoardings and display boards are also required to be installed along the fringes and along the roads crossing through the sanctuary.

3.5.20 Weed infestation: Natural vegetation of the region is adulterated by a number of unwanted plant species (weeds), which have notoriously acclimatized to the lengths and breadths of the sanctuary. *Lantana camara* and *Parthenum hysterophorous* have left no space unoccupied and have been reported in all the compartments of the sanctuary. Other notorious weeds like *Ageratum conyzoides*, *Cannabis sativa* and *Argemone mexicana* have been found growing mainly along with the national highway passing through the sanctuary. The dense growth of *Lantana camara* poses a great obstruction in the movement of wild animals. Moreover, *Lantana camara* draw-up moisture from various layers of soil and render the soil stratum dry and also pose significant threat to germination of local species. *Justicia adhatoda* being unpalatable to livestock and with the ability to colonize waste places and disturbed areas has become a weed in the sanctuary covering over a vast area.

3.5.21 Scarcity of water: As no permanent source of water is present in the sanctuary, various earthen ponds have been constructed to quench thirst of the wild animals. But these get dried up during the hot summer season, therefore causes great water scarcity in the area. Moreover, proper allocation and distribution of the water holes has not been done. At few places water holes are constructed within half kms of distance, whereas at other places viz. Co-2/R, Co.3/R and Co-1/P, 2/P and 3/P no water holes are present at all. However, the leakage of water pipes passing through the sanctuary serves as a source of water during dry periods in these compartments. The only perennial source of water i,e, river Tawi passing through the southern corner of the sanctuary is the source of water during dry spell which exposes animals to risk, as to reach the river animals have to cross two roads passing through the southern portion of the sanctuary. There is an urgent need that the already existing ponds be renovated and new should be constructed after regular distance in all the compartments rationally. Arrangement can be made with PHE to get assured and fixed amount of water for the ponds on daily basis. Moreover, artificial refilling of these water holes should also be provisioned. Location of water holes should be finalized keeping in view the animal's movement and at the places where there is sufficient fodder/feed is available.

3.5.22 Expansion of transport network: National highway (1A) passing through the sanctuary cause disturbances to the forest, and in some way to curtailing free physical movement of the wild animals. Roads also have other undesirable deleterious consequences to forest ecology such as weed proliferation, biotic pressure due to littering, unregulated movement and others.

These transportation arteries built for the convenience of man arbitrarily divide wild habitats, potentially separating existing animal populations from food and water sources, forcing them to cross the road and endure the dangers entering traffic entails .Moreover, continuous movement of vehicular

traffic, blowing of pressure horns and obnoxious exhausts could alter the reproductive, feeding and social behaviour of the animals. In addition to this, circular road along the eastern fringe and the army road in the middle of the sanctuary pose large number of direct and indirect impacts to the sanctuary ecosystem. The prevalent practice of throwing bread and fruits to monkeys is not only altering their feeding habits but also making them prone to accidents.

3.5.23 Contamination of environment: The dumping of non-biodegradable and construction waste along the roadsides by the locals during the night hours has been noticed in the sanctuary. In addition to this littering done by moving vehicular traffic is posing a serious threat which further contaminates and degrades the environment. To prevent these activities, it is proposed to have two check posts, watch towers, animal friendly fencing, night patrolling, installation of video cameras etc.

3.6 Summary of threats to wildlife:

Since, the area lies just adjacent to the Jammu city which is thickly populated thus disturbances to the wild animals due to noise pollution, air pollution, man-animal interface are there which causes a great threat to the wildlife of the area. Due to the grazing of domestic animal inside the sanctuary, threat to the wild animals due to domestic animal is also there. There are issues of dumping of waste inside the sanctuary; vehicle traffic through the sanctuary, movement of morning walkers and public through the sanctuary causes threat to the wildlife which impact the Wildlife distribution, movement and phycological problems in wild animals.

Major threats are: -

1. Invasive alien species, such as Lantana spp., Parthenium spp. etc.
2. Firewood collection
3. Human-wildlife conflict
4. Soil erosion
5. Encroachments
6. Grazing of domestic animals.
7. Unregulated Biotic interferences
8. Roads and traffic


Fig. 3


Fig. 6

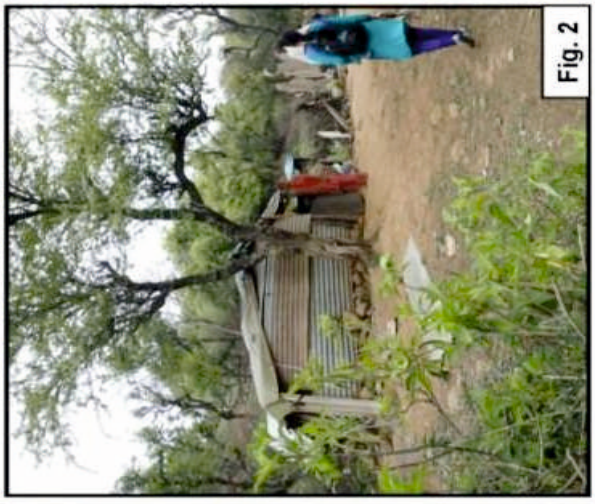


Fig. 2


Fig. 5


Fig. 1


Fig. 4

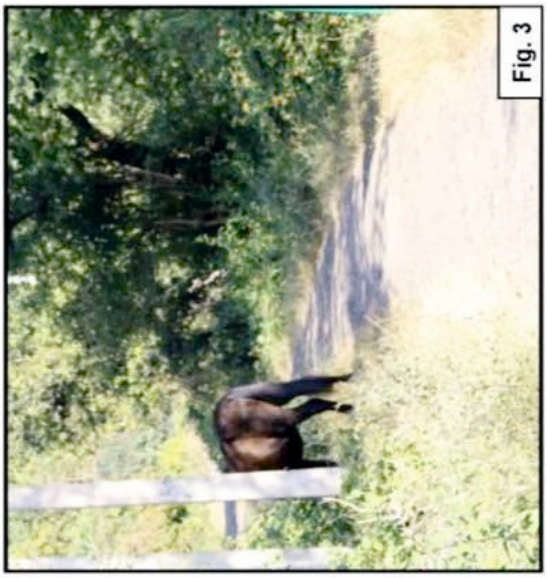


Fig. 3


Fig. 2

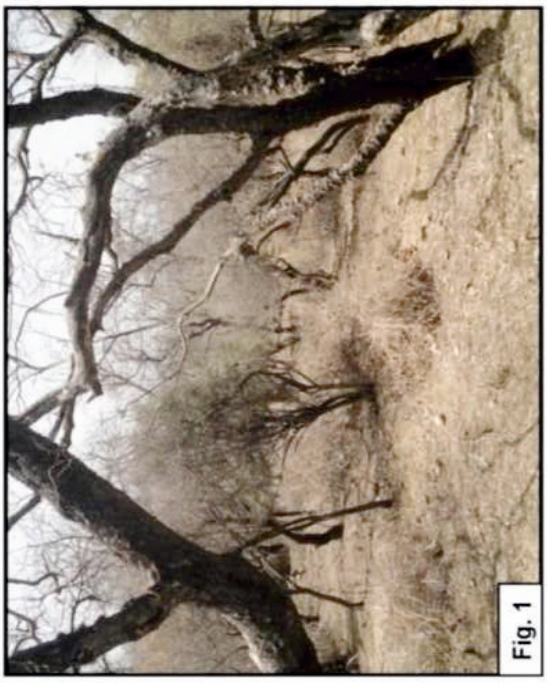


Fig. 1


Fig. 6


Fig. 5


Fig. 4


Fig. 3


Fig. 2


Fig. 1


Fig. 7


Fig. 6


Fig. 5


Fig. 4


Fig. 2


Fig. 4


Fig. 1


Fig. 3

Pictures Displaying Habitat Management Interventions in Ramnagar Widlife Sanctuary

Soil & Moisture Conservation Works (DRSM work)

Patch Sowing

Plantation work

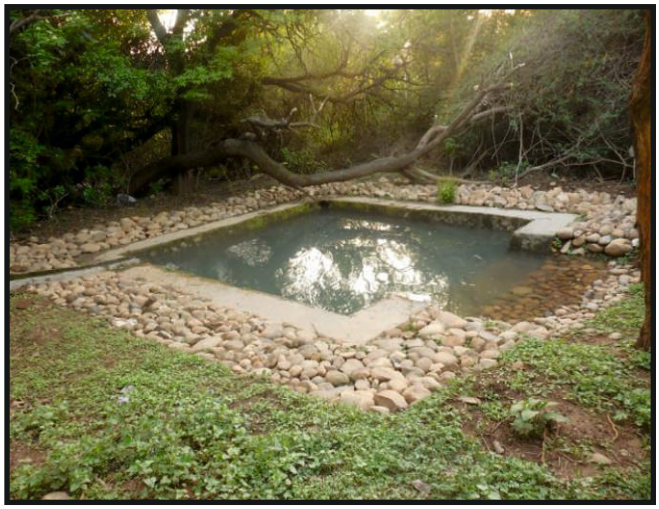
Fruit Plantation

Plantation of Grass slips

Const. of inspection path

Const. of water hole

Const. of water hole



Const. of water hole

Plantation of Grass slips

Climber cutting

Wildlife Habitat Management interventations in Ramnagar Wildlife Sanctuary

Creation of fireline

Fencing work

CHAPTER - 4
THE PROTECTED AREA AND THE INTERFACE LAND USE SITUATION

4.1 The existing situation in the zone of influence:

As the rights remain unsettled, it is not possible to distinguish between genuine right holders and encroachers. The zone of influence within sanctuary varies from the activities of those who occupy the lands within, to those outside who use the sanctuary for livelihood purposes. There are number of villages located surrounding the boundaries of the sanctuary. The livelihood of villagers is agriculture, animal husbandry, poultry and Dairy activities. Prior to declaration of sanctuary, people used to be dependent on the natural resources of the area such as livestock grazing, firewood collection. The villages located near to the sanctuary have some negative impacts like crop raiding and loss of livestock due to straying of wild animals from the sanctuary. Traditionally the fringe residents are conservation oriented therefore extent of alienation is not very significant but today because of increase in human-wildlife conflicts and livestock depredation by leopard and crop damage by wild boars, monkeys etc, the attitude is changing. The zone of influence of Ramnagar Wildlife Sanctuary is identified between 1-5 kms of the legal boundaries of the sanctuary.

4.2 PA- People interface:

In the past, the area was mainly used by the villages for grazing their cattles. People enter the sanctuary for firewood and cattle grazing. The various resources from the sanctuary meet their various purposes. Now, fringe village people frequently suffer crop raiding by wild animals especially wild boar, monkeys, conflicts due to leopard and reptiles. Thus PA-People interface has increased in negative sense due to conflicts and restrictions imposed due to declaration of sanctuary as Protected Area.

4.3 Human-Wildlife conflict:

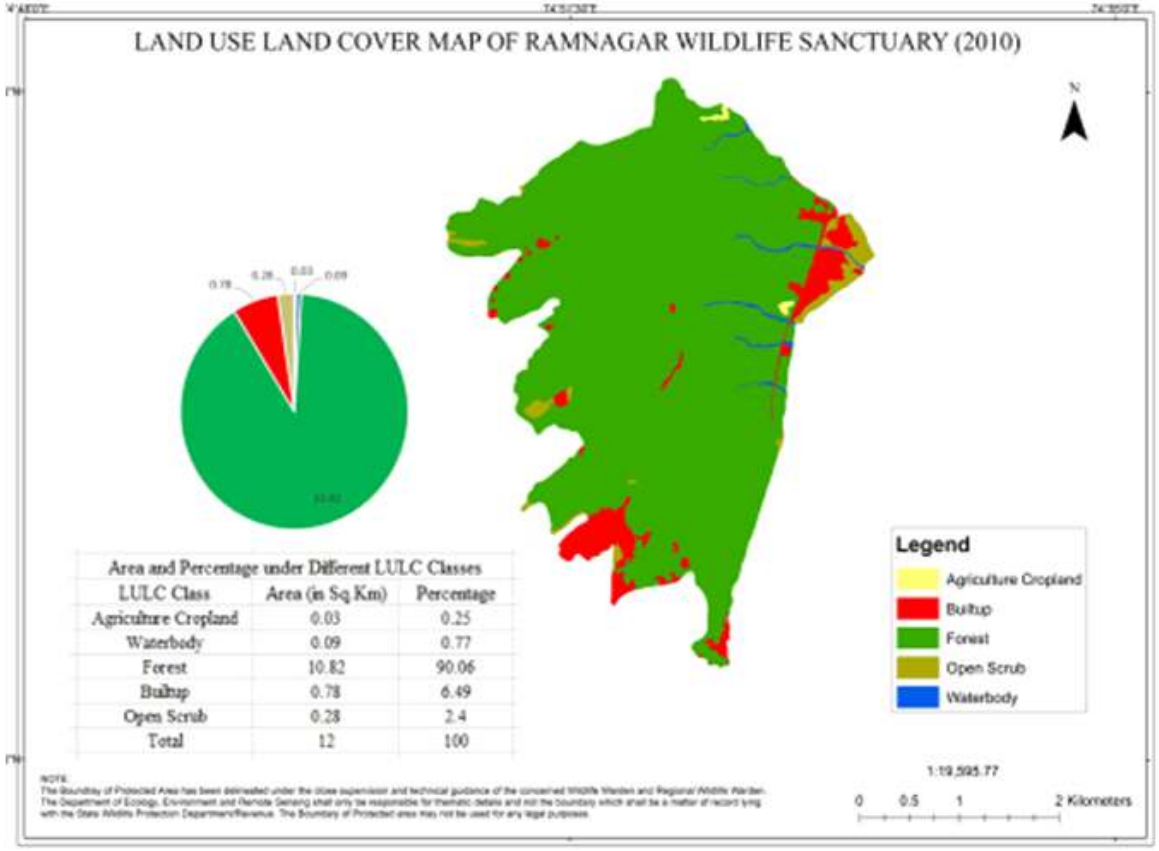
With every passing year, human-wildlife conflicts are rising, especially in the fringe villages. Frontline staff of the Wildlife Department posted in the area, continuously monitor vulnerable spots to engage with local community to prevent conflicts. The main species of conflict has been the Wild boar, leopard, porcupine, monkeys and reptiles like monitor lizard, snakes etc which often enter the city/village habitations and comes in conflict. The Department also supplies crackers to the locals to ward-off conflict animals during the crop seasons. Whenever, an animal enters a human locality, it is being rescued by the Rescue Team of Control Room Jammu within minimum possible time and after its proper checking and treatment, rescued animals are rehabilitated back to wild. In case of any human attack, the compensation is decided under the relevant slab based on the type of injury and provided to affected family within the least possible time subject to availability of funds.

4.4 Livestock Grazing:

There are about 30-40 families of nomadic Bakerwals with the huge livestock of 800-1000 cattle heads, who are grazing their cattles inside the sanctuary during winter. The concentration of these graziers is maximum in Co.1/P,2/P,3/P,3/R and 4/R.In addition to the grazing by nomadic Bakerwals; locals living in nearby habitations also use the forest areas for grazing. There are specific proposals in this plan to increase the availability of forages outside the sanctuary area to promote stall feeding, to generate for change in their life styles so that the domestic animals may not enter the sanctuary area.

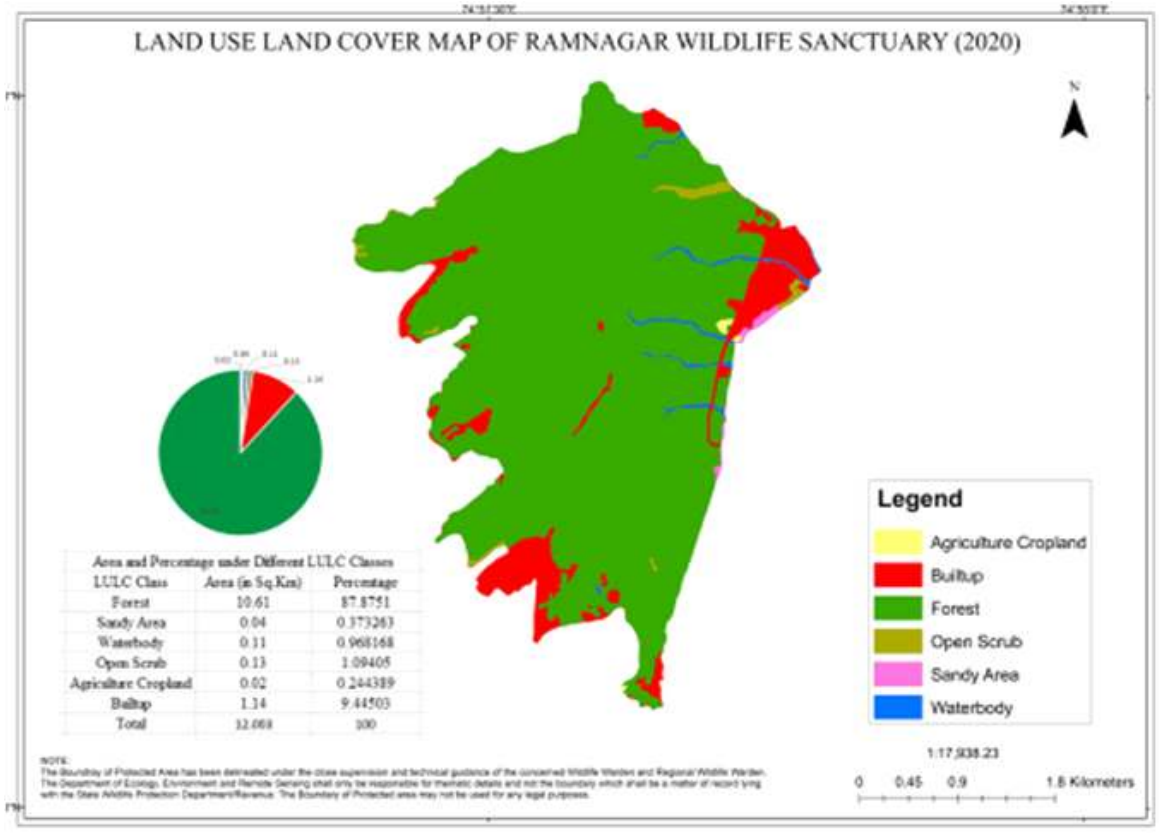
Grazing animals cause below mentioned problems to wild animals

(i) Interference in habits and habitat.
(ii) Reduction in food availability for herbivores.
(iii) Disease propagation.
(iv) Reduction in area of wilderness needed for the wildlife.



Area and Percentage under Different LULC Classes

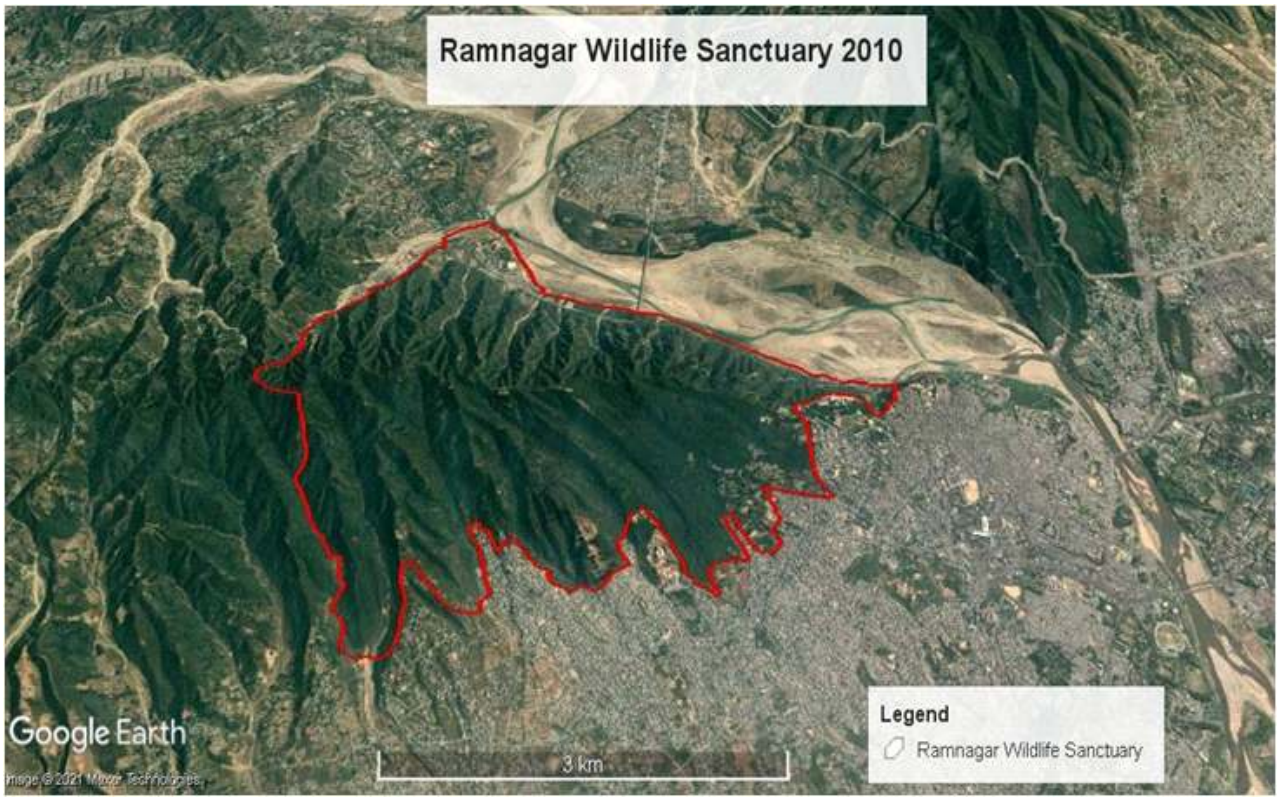
LULC Class	Area (in Sq Km)	Percentage
Agriculture Cropland	0.03	0.25
Waterbody	0.09	0.77
Forest	10.82	90.06
Builtup	0.78	6.49
Open Scrub	0.28	2.4
Total	12	100



Area and Percentage under Different LULC Classes

LULC Class	Area (in Sq Km)	Percentage
Forest	10.61	87.8751
Sandy Area	0.04	0.373263
Waterbody	0.11	0.968168
Open Scrub	0.13	1.09405
Agriculture Cropland	0.02	0.244389
Builtup	1.14	9.44503
Total	12.088	100

(Figure: Comparative Google Images of 2010 and 2020)



Land use change in Ramnagar Wildlife Sanctuary (2010 – 2020)

LU/LC CLASS	RAMNAGAR WILDLIFE SANCTUARY (2010)		RAMNAGAR WILDLIFE SANCTUARY (2020)		Change in sq. kms
	Area Sq.kms	Percentage	Area Sq.kms	Percentage	
Agriculture Cropland	0.03	0.246	0.02	0.16	-0.01
Built up	0.82	6.75	1.14	9.38	0.32
Forest	10.93	89.96	10.71	88.15	-0.22
Open Scrub	0.28	2.3	0.17	1.4	-0.11
Water	0.09	0.74	0.11	0.90	0.02
Total	12.15	100	12.15	100	

Possible reasons for change in land use pattern are: -

(i) In fringe areas, due to increase in population as a result of migration towards cities, new colonies emerging and land use has changed from agricultural land to built up area. Moreover, new public infrastrucutres have also been added in and around the sanctuary like construction of highways, water reservoirs, electric grids and transmission lines etc.

(ii) Degradation of forest covers along the fringes due to heavy lopping and grazing pressure.

(iii) Diversion of forest area for the construction of public infrastructure like roads, transmission lines etc.

4.5 The development programmes and conservation issues:

Major activities around the sanctuary are expanding agriculture and city infrastructure constructions. Agriculture also requires massive inputs in the form of fertilizers and insecticides. Another major issue is extensive construction in the surrounding area which needs to be planned so as to ensure its compatibility with the area. The department looks for betterment and development of Sanctuary area by taking up several activities like construction of water harvesting structures, plantation, watch towers, inspection paths, other habitat improvement activities etc. and other facilities for tourist visiting in the area.

4.6 Summary of problems faced by people that affect the management of the protected area:

Few of people's issues that affect the PA management directly and indirectly are detailed as under:

1. Non settlement of rights and boundary demarcation.
2. Unemployment among fringe communities.

3. Crop protection from monkey, porcupine, wildboar.
4. Scarcity of fodder for cattle.
5. Regulation of traditional access to forest resources in the sanctuary.
6. Non availability of suitable land for grazing by the nomads.

Unemployment seems to be the main problem faced by locals. Local villagers are dependent on their own private agriculture land. Traditionally they are rearing cattles as source of income.

Crops raiding by the wild animals is another problem. porcupine, wild boar and monkeys are the main wild species that damage crops.

4.7 Eco developmental initiatives:

Though dialogues have been initiated for eco-development activities, it has not taken shape due to certain conflicts related to settlement of rights. Efforts towards meaningful eco-development initiatives are still going on. The sanctuary does not have a trained team for the planning, implementing and coordinating of eco-development activities.

Table 4.1 Year wise Eco-Development Activities in Ramnagar Wildlife Sanctuary are

Year	Eco-development Activity	Scheme	Financial (in lacs)	Expenditure
2015-16	-	-	-	-
2016-17	-	-	-	-
2017-18	-	-	-	-
2018-19	-	-	-	-
2019-20	The scheme remained as non started for lack of financial provisioning, however, efforts are needed to revive.	-	-	-

Part - II

Proposed Management

CHAPTER - 5
VISION, OBJECTIVES AND PROBLEMS IN ACHIEVING THE OBJECTIVES

5.1 Vision:

"Conservation of Wildlife with Special Emphasis on Wildlife Habitat and Watershed Management."

Like every other management plan, this management plan also envisions a well-protected and efficiently managed Ramnagar wildlife sanctuary. The plan strives to ensure that there is a sustainable flow of ecosystem services from the Protected area alongwith Conservation of wildlife with Special Emphasis on Wildlife Habitat and Watershed Management.

Broad management strategies will be:

(i) Setting aside a few inviolate zones,
(ii) Maximizing management inputs within the sanctuary.
(iii) Minimizing the threats/disturbances to the area.

5.2 Management objectives:

Objective 1 : To conserve and protect the Wildlife habitat, restore the Bio-physical integrity of the area in addition to restoring the degraded portion of the sanctuary so that endangered and endemic flora and fauna inhabiting the area are adequately protected and propagated.

The primary objective of the management plan shall be to strengthen the framework for better protection of the sanctuary and wide array of species of flora and fauna found here. This can only be achieved by following a holistic approach and providing comprehensive protection to all communities of wild plants and animals found within and around the sanctuary. These objectives mandate complete stoppage of all such human activities which threaten the ecological integrity of the sanctuary. There is also need to strengthen the mechanisms for involvement of stakeholders especially the local communities living in the vicinity of the sanctuary.

Objective 2 : To mitigate human-wildlife conflicts in and around the Protected area and creation of awareness among the locals.

To mitigate man-animal conflicts and to create awareness among the people in general and children in particular about habits of wild animals found in the area with particular emphasis on their ecological role. Human-wildlife conflict is emerging as one of the greatest threats that the humankind has ever faced apart from climate change. Any conflict between human society and wildlife has the potential to derail the best of the conservation initiatives. The management plan shall, therefore, provide for strategies which should be used to prevent and mitigate human-wildlife conflict in and around the Ramnagar Wildlife Sanctuary. The plan also suggests the consideration of compensation for crop losses incurred due to crop raiding/depredation by the wild animals under relevant schemes of the Govt.

Objective 3 : To develop a model of responsible tourism which augments the conservation of Protected area and ensures prosperity and well being of the local community.

To promote Eco-tourism for conservation, awareness, education and scientific exploration without

affecting the sensitive ecosystem adversely. All over the world, the protected areas offer significant opportunities for tourism and recreation while at the same time generate revenue for the government, tourism industry, and for the local communities as well. This management plan also proposes strategies for setting up of an ecologically responsible tourism model for the Sanctuary which ensures that the local community has an active involvement and economic benefits of ecotourism trickle down to the needy. The objective also focuses on capacity building for locals and other resource persons for promotion of ecotourism. It has been observed that number of visitors/tourists visits the Manda deer park and Manda eco-trail daily. A regulated and guided eco-tourism in the Ramnagar Wildlife Sanctuary can be initiated in order to generate awareness to visitors, bird watching, nature walk/trek etc.

Objective 4 : To reduce dependence of people on forest-based resources in the zone of influence, with sensitivity to cultural and economic well-being of the communities, through eco-development activities.

Objective 5 : Capacity building of staff and locals

To improve capacity building of staff and local communities for efficient management of the sanctuary through better training and infrastructure. Regular training of staff and locals including PRI members should be organized regarding use of monitoring equipments like Camera traps, night vision binoculars, GPS, cameras, drones etc. Also, regarding Census and crime investigation etc. so that with this limited staff maximum output could be generated.

Objective 6 : To promote scientific and ecological studies that will help the sanctuary management in assessing physical and biological resources, planning for conservation of these resources and monitoring the health of the habitat.

To promote scientific and ecological studies that will help the sanctuary management in assessing physical and biological resources, planning for conservation of these resources and monitoring the health of the habitat. The management plan also suggests to carry out long term research and monitoring of the Sanctuary. The research findings should help in further streamlining of the Sanctuary management after thorough review of the management in the next phase. Partnerships must be developed with various research institutions for conducting inter-disciplinary research on various aspects related to the Sanctuary.

5.3 Problems / constraints in achieving the objectives of management and strategies:

Objective 1 : To conserve and protect the habitat, restore bio-physical integrity of the area in addition to restoring the degraded portion of the sanctuary so that endangered and endemic flora and fauna inhabiting the area are adequately protected and propagated.

Challenges	Proposed Strategies
1. Un-demarcated and Porous Boundary	• Settlement of rights and identification and removal of encroachments. • Proper demarcation & 100% fixation of B.P in Wildlife area during the Plan period. • Coordination with FPF/ Territorial staff/ Revenue/ Police personal. • Capacity building and training. • Fencing of sensitive open portions.

2. Rights not determined/Settled	• Fallowing the matter with concerned authorities regularly for settlement of rights on priority. • Involvement of panchayats. • Formulation of Eco-development committees.
3. Pressure of grazing by seasonal nomads	• Alternate grazing lands outside the Sanctuary to be identified. • Nomads along with cattles to be shifted out of the Sanctuary in a phased manner. • Enrichment of open blanks with native grass species. • Enrichment of ESZ areas for grazing. • Identification of minimum inviolate areas for the wild animals. • Grazing should be regulated and controlled. • Promote stall feeding.
4. Management of weeds	• Regular de-weeding fallowed by planting of local grass/fodder species. • Catchment area treatment. • Managing Sanctuary areas with suitable ground cover for wild animals for hiding and breeding of the wild animals.
5. Fire	• Strengthening of Control Room. • Construction/maintainance of Fire Lines. • Engagement of seasonal fire watchers. • Awareness camps. • Procurement and Servicing of firefighting Equipments. • Involvement of local/Panchayats.
6. Tough terrain	• Creation and maintainance of Inspection paths. • Up-gradation of natural Trails. • Construction of water points/water holes/ salt licks. • Construction of watch towers installed with latest equipments for monitoring.
7. Biotic pressure	• Regulated movement of public/nature lovers inside the sanctuary. • Porous boundaries towards city and villages should be strengthened by way of proper boundary walls/chain-link fencing. • Establishment of proper Check Posts at the entries and exits.

	• Check posts, display boards and speed control barriers to be installed along the highways and other link roads. • Underpasses to be constructed for the animals for safe passage on the highway and link road. • Installation of proper signages and boards. • Use of modern equipments for monitoring of animals and human movement.
8. Taking over of balance area of Sanctuary from Forest Department (Teritorial)	• Notified Sanctuary area still with Forest Department (Teritorial) is to be taken over in a time bound manner to bring it under management plan provision.

Objective 2: -To mitigate human-animal conflict and to create awareness among the people in general and the children in particular about nature and wildlife with particular emphasis on the ecological role of the sanctuary area.

Challenges	Proposed Strategies
1. Challenge posed by wild boar, porcupine, monkeys etc.	• Census/population estimation of monkeys. • Monkey menace needs to be mitigated on scientific basis. • Plantation of native wild fruit crops. • Awareness among public to stop feeding monkeys along the roadside. • Identification of monkey rescue pan areas for its part/temporary relocation away from habitations. • Crop loss compensation arrangements as admissible.
2. Wild Animal movements in human habitation	• Awareness among public in respect of habits of Leopards, reptiles and other wild animals. • Do's and don'ts display boards. • Removal of weed for free movement of animals. • Closing of open boundaries with proper fencing. • Avoid unregulated grazing. • Crackers/ drum beating. • Sensitization of locals. • Develop the area as sink for rescued animals especially reptiles and birds.

3. Up-gradation of Manda Deer park/ Rescue Centre	• Construction of new species specific enclosures as per CZA norms. • Remodeling and upgradation of existing enclosures as per CZA norms. • Capacity building of animal keepers and other staff. • Deployment of sufficient staff.
4. Up-gradation of Veterinary Care Facility at Manda	• Procurement of latest equipments. • Extention and upgradation of infrastructure. • Deployment of sufficient veterinary staff.
5. Strengthening of Manda Control Room	• Procurement of latest equipments. • Extention and upgradation of infrastructure. • Deployment of sufficient staff.

Objective 3 : To promote Eco-tourism for conservation, awareness, education and scientific exploration without affecting the ecosystem adversely.

Challenges	Proposed Strategies
1. Lack of resource person	• Capacity building for locals and other resource persons as part of Eco-tourism promotion initiative. • Awareness camps among the people.
2. Nature interpretation facility	• Interpretations are required at grass root level in collaboration with panchayats members. • Celebration of important days like World wetlands day/ Environment day/ Wildlife week. • Regular programme in different schools to inculcate the feeling of responsiveness among children. • Awareness through media-print electronic media/ Posters. • Provision for upgradation of Nature Interpterion Centre. • Strengthening of infrastructure for Eco-tourists. • Organising different guided tours/programs.

Objective 4 : To reduce the dependence of the people on forest-based resources in the zone of influence and promote well-being of the dependent communities, through eco-development activities.

Challenges	Proposed Strategies
1. Rights of locals not settled.	• Following the matter with concerned authorities regularly for settlement of rights on priority. • Identification and Demarcation of boundaries. • Removal of encroachments.
2. Ensuring Co-operation from panchayats and other departments.	• Regular meeting at different hierarchical level and implementation of decisions made in consultation with PRI's. • Taking up eco development activities in consultation with PRIs
3. Zone of influence not demarcated.	• Demarcation of land in zone of influence is required to be identified and management should be planned accordingly.
4. Crop damaged by wildlife animal like wild boar, monkey, nilgai and cattle lifting by large carnivores.	• Production of Sufficient food/fodder requirement for wild animals within protected area. • Management of herbivore population. • Provisioning for compensation for damages.
5. Agriculture and Animal Husbandary are major means of livelihood.	• Generation of alternative livelihoods for locals. • Capacity building of locals. • Organising tours of locals to other PAs of country.

Objective 5 : To improve capacity building of staff and local communities for efficient management of the sanctuary through better training and infrastructure.

Challenges	Proposed Strategies
1. Inadequate training and capacity building of staff	• Regular training programme in the relevant institutions. • Practical training on use of equipments, case framing, investigation of crimes, sample collection etc. • Visits to well established protected areas out of UT etc.
2. Lack of information on Biodiversity	• Periodic baseline survey in Wildlife of the area. • Ethno botanical knowledge sharing by locals. • Updation of People Biodiversity registers.

Objective 6 : To promote scientific and ecological studies that will help the sanctuary management in assessing physical and biological resources, planning for conservation of these resources and monitoring the health of the habitat.

Challenges	Proposed Strategies
1. No census / inadequate studies of wildlife and habitat	• Regular population estimation of wildlife. • Promote University researches in regular studies of the area on different topics. • Consolidation and compilation of earlier studies conducted by various research institutions.
2. Inadequate data on impact of Tourism	• To study tourism/visitor pressure on sanctuary. • Guided trek routes should be identified. • To work out carrying capacity of the sanctuary with respect to visitors. • Provision for Sanctuary access fees.

5.4 Review of Management of the Protected Area:

A Management Evaluation Exercise (MEE) was conducted for the year 2018-19 for all the protected areas of the Jammu & Kashmir. During the exercise, the management of Ramnagar Wildlife Sanctuary was reviewed for its effectiveness. Ramnagar Wildlife Sanctuary, Jammu & Kashmir got MEE Score- 57.50% (Fair).Following actionable points were suggested in the evaluation exercise.

Immediate Actionable Points:

1. Management plan under preparation, should be in accordance with the guidelines of Wildlife Institute of India and include assessment of threats and strategy to mitigate challenges due to degradation of the habitat, protection, tourism and climate /ecology change management issues.
2. The remaining area of 23 Sq.km notified as sanctuary should be immediately transferred to the Wildlife Warden, Jammu for better management.
3. The chain link fencing within the sanctuary is to be removed to permit unhindered movement of wildlife.
4. Adequate funds are to be provided for removal of *Lantana camara*, and the area is to be planted with indigenous plants.
5. Three Forest Guards need to be stationed, on the trail daily to enforce the laws of the sanctuary and to prevent the morning walkers from creating a disturbance.
6. The feeding of monkeys within and at the periphery of the sanctuary needs to be stopped immediately.
7. Six camera traps need to be installed within the sanctuary to study its biodiversity and to provide

protection.

8. The rich biodiversity of the sanctuary serves as a lung for the Jammu city and should be protected by deploying adequate staff and infrastructure enhanced for effective functioning.
9. A minimum of two anti-poaching camps need to be established within the sanctuary so that the protection is improved and and the habits and habitats of the wild animals can be studied regularly within the sanctuary.
10. The concerns of the frontline subordinate staff regarding their promotions and special pay, on par with the staff of the Forest Protection Force, need to be attended on priority.
11. Our assessment is that six camera traps, five pairs of binoculars, two sets of drones, 11 GPS, one four-wheel vehicle (for the Range Officer), and one rescue van and motor cycle for each forester serving in the sanctuary are needed. These need to be provided immediately.
12. Research and documentation need to be promoted. Periodic biodiversity assessments of the sanctuary need to be undertaken with the help of the field staff and students of Jammu University under the guidance of wildlife-trained faculty members of Jammu University. The Research Officer posted in the office of the CWLW should take up other research projects according to the requirements of the management.
13. Since, the local villagers are already supporting the Wildlife Staff in protecting the wildlife and its habitat, an eco-development committee needs to be constituted immediately under JFM in the adjacent villages. The DFO needs to seek funds under various schemes for eco-development activities.
14. The school of Khanpur village, located in the foothills in the sanctuary needs to be saved from landslides and erosion. These problems need to be addressed immediately as the villagers are supporting the staff in protecting and conserving the wildlife and habitats.
15. There is a need to create cattle pounds to control illicit grazing and impounding cattle violating sanctuary rules.

All the actionable points observed by the Management Evaluation Exercise (MEE) Commettee has been dully considered and given priority to be addressed during the plan period in the management plan.

During next review of the Management Plan, change in species richness, diversity and pattern is also required to be reviewed and incorporated based on the different studies conducted by different organisations over the area.

CHAPTER - 6
THE STRATEGIES AND ACTION

Boundaries, Zonation, zone plans and Theme plans:

The main emphasis will be laid on the improvement and conservation of the natural ecosystem of the sanctuary for promotion, protection and propagation of wildlife while ensuring the well being of local communities. This will be achieved by eliminating all tendencies leading to degradation of the flora & fauna, and restoration of the degraded patches of the wildlife habitat in the sanctuary.

6.1 Boundaries:

Ramnagar Wildlife Sanctuary is surrondred by Jammu city on the south and west directions, on the east ward there is village Khanpur, Nagrota and Sidhra. Since, rights have not been settled so there is huge pressure of encroachment/biotic interferences in the Protected Area. The Wildlife Protection department shall facilitate for settlement of rights. Matter is required to be taken up with concerned authorities for settlement of rights at the earliest, so that interferences could be minimized at the earliest.

6.2 Zonation and Zone Plan:

Since, the area of the sanctuary is very small and is being traversed by National Highway and link roads therefore, zonation is not practically feasible. However, some inviolate zones are proposed where minimum interferences will be allowed except habitat improvement activities. The objective of proposing these inviolate zones are to provide a geographical framework to manage the sanctuary biodiversity and its critical wildlife habitats.

Sanctuary zonation scheme has been developed to:

- ❖ Provide a geographical framework to manage the Sanctuary.
- ❖ Indicate which management practice is required in a particular part of the Sanctuary.
- ❖ Indicate the type and level of use is appropriate throughout the Sanctuary which can assist in minimizing existing and potential conflicts between users and activities, or between these and the protection of Sanctuary values.
- ❖ Provide a basis for assessing the suitability of future activities and development proposals.

Zonation: In order to achieve the objectives, the sanctuary is divided into the following zones:

A) Inviolate zone: The "no disturbance/Least disturbance zone". In other words, no public moment, grazing, lopping etc. will be allowed in this zone. Majority Portion of Compartment 1/R and 4/R, are proposed in this zone comprising of total area **320 ha.** However, in the inviolate zone, the following activities can be carried out during the plan period.

- ❖ Fire protection measures.
- ❖ Construction and maintenance of Water holes.
- ❖ Consolidation and maintenance of boundary.
- ❖ Protection camps i.e anti-poaching camps.

- ❖ Communication facilities.
- ❖ Habitat improvement and Management activities.

❖ Removal of all type of fencing which is restricting the free movement of animals inside the sanctuary.

B) Eco-restoration zone: This zone primarily comprises of existing plantations, weed infested and degraded areas within the sanctuary where there is more public interference and heavy grazing pressure has disturbed the area. All Compartments except inviolate zones are proposed under Eco-Restoration Zone, which includes Co.2/R,3/R,1/P,2/P and 3/P and balance portion of Co.1/R and 4/R.

6.3 Plan for Eco-restoration zone:

Eco-restoration zone of the Sanctuary is proposed to consists of **Eco-tourism zone, Eco-restoration zone and Eco-Development zone.**

Plan for Eco-Restoration Zone: In order to protect the natural resources of the protected area the following strategies and activities are proposed.

- ❖ Consolidation and maintenance of boundary.
- ❖ Establishments of new administrative units.
- ❖ Establishment of anti-poaching camps.
- ❖ Proper patrolling schedule for the staff.
- ❖ Regulation of cattle grazing.
- ❖ Fire Management strategies.
- ❖ Habitat improvement by way of plantation, weed eradication, construction of waterholes, fencing etc. wherever required etc
- ❖ Catchment area treatment of micro-watersheds of the sanctuary
- ❖ Deployment of staff and construction of basic infrastructure for the field staff
- ❖ Protection and monitoring equipments.
- ❖ Communication facilities.
- ❖ Watch towers.
- ❖ Regulate public interferences.
- ❖ Awareness activities in the fringe areas.

For regulating and control over grazing and firewood collection, the following strategies are proposed.

1) Grazing:

- ❖ Regulation of grazing by nomads; if possible, should be shifted out of the sanctuary.
- ❖ Study and monitor the number, extent and impact of grazing.
- ❖ Maintain adequate pasture cover by better stock management.
- ❖ Weed clearance should be done on regular basis and before the monsoon season so that sufficient grasses could come up.
- ❖ Capacity building of locals/tribals who are grazing their cattles inside the sanctuary.

- ❖ If required vaccination of cattle- twice a year.
- ❖ Eco-sensitive zone areas should be properly enriched with fodder and grass species so that domestic animal grazing can be shifted outside the sanctuary area and mixing of wild and domestic animals could be avoided.
- ❖ To reduce number of cattles by providing alternate livelihood and encourage stall feeding.

2) Firewood collection:

- ❖ Study the extent and impact of firewood collection.
- ❖ Prevent collection of indigenous species as fuel wood.
- ❖ Exotic species may be permitted to be collected as fuel wood with mutual commitments as part of phased removal of exotics.
- ❖ Propose fuel wood plantation, wherever required within community land/ Eco-development zone.
- ❖ Providing energy saving devices among the fringe communities.

6.4 Plan for Eco-Tourism and Interpretation zone:

Although tourism is considered as an important source of employment to a large number of travel agents, local guides and local communities but within the Ramnagar Wildlife Sanctuary it has to be managed in a way that it should not become taxing on the natural resources of the Sanctuary. Large parties of tourists often require equally large infrastructure including camping gear and support staff.

Hence, all tourism activities within the premises of sanctuary needs to be organized by sanctuary management through community-based organizations. Major activities proposed for management of tourism in the sanctuary include identification and designation of trekking sites, bird watching sites etc away from sensitive wildlife habitats, better garbage disposal to manage tourism in an organized manner.

Activities under Eco-tourism:

It is proposed to establish visitor information centre and develop simple en-route signages for the benefit of visitors regarding important wildlife of the area, their behavior and importance, do's and don'ts in protected areas etc.

Strategies and Activities:

- ❖ Environmental conservation awareness.
- ❖ Facilitating nature-based regulated tourism.
- ❖ Identification and development of new trek routes for bird watching, research etc.
- ❖ Capacity building and training to the locals regarding eco-tourism.
- ❖ Creation of eco-friendly basic infrastructure for the eco- tourists.
- ❖ Upgradation of NIC and Manda Rescue Centre.
- ❖ Regulation of multiple entries to the Sanctuary.

6.5 Plan for Eco-development zone:

The major issues related to People-Protected Area interface are human wildlife conflict. People in the villages/city around the sanctuary are dependent on the Protected Area. The Eco development

programmes are yet to take off mainly due to hostility of local people regarding settlement of rights, non-compensation for crop damages and absence of trained staff and support team. To strengthen people Protected Area interface, the following strategies and activities are proposed.

- ❖ Development of appropriate barriers to prevent wildlife especially wild boar and porcupine entering into farmlands/habitations, timely assessment of wildlife danger and damages.
- ❖ To conduct habitat improvement programmes within the sanctuary to prevent the animal from drifting outside.
- ❖ Designing and implementing community-based eco-development programmes.
- ❖ Imparting training to staff and locals for their capacity building.
- ❖ Provisioning for supply of wood saving appliances.
- ❖ Local communities can play an important role in the management of sanctuary. They have great traditional knowledge. Awareness must be created among the locals about the importance and the conservation of wildlife and biodiversity which can be done by performing street plays, dramas, awareness drives in schools and colonies etc. They should be involved in decision making, so that they don't feel neglected and in this way they will have a better communication with the department. Small groups of local people should be formed and they should be trained for various activities like bee-keeping, raising private nurseries, plantations, as tourist guides etc so that they can generate some income for their livlihood. Local communities are to be encouraged to take up stall feeding in a big way.

6.6 Theme Plans:

- ❖ Theme Plan for Protection.
- ❖ Theme Plan for Habitat improvement.
- ❖ Theme Plan for Fire management.
- ❖ Watershed /Catchment area treatment.
- ❖ Theme Plan for Awareness.

6.6.1: Theme Plan for Protection :

Infrastructure related to Protection:

1) **Antipoaching Camps:** Antipoaching camps are required to be established in sensitive areas and at certain corridors where there are threats of poaching. Special teams are proposed to be constituted for these camps who can collect the primary and secondary evidences in case of any poaching incident is noticed along with monitoring of wildlife movement as well as tresspassers. Special trained staff should only be deployed in such camps on rotation and roster basis. Assistance of Forest Protection Force can also be seeked for deployment of FPF personals for joint teams.
2) **Check posts:** To check the illegal dumping of waste, illegal transport of forest produce, to regulate the grazing and unauthorized entry into the sanctuary two check posts are proposed to be established in Ramnagar Wildlife Sanctuary at Manda and Panjtirthi area of the sanctuary. These check posts will be properly manned by the officials of the department and also, if possible, it could be joint check posts manned by wildlife staff and FPF Personels. The staff posted in these check posts will keep eye on the illegal activities on national highway and its surroundings during day

and night hours. Staff posted in these check posts should be properly trained for the duties.

3) **Roads & Patrolling paths:** There are two roads passing through the sanctuary on which heavy traffic crosses through the area. There are no speed breakers/speed limiters installed on these roads, therefore speed breakers are required to be installed after regular intervals so that over speeding can be regulated and threat to wildlife could be minimised. Moreover, animal passages through/over these roads are required to be constructed keeping in view the species of the area, so that animals could cross these roads without coming into conflict with vehicles/humans. There is also requirement of installation of sufficient display boards for speed limits after regular gaps. Also some internal patrolling paths and roads are proposed to be developed preferable in Co. 1/P, 2/P, 3/P and 3/R so that staff could move and monitor the area effectively.

4) **Vehicles:** Proper survelliance of the area can only be possible, if proper convience facilities are provided to field staff. In this regard maintenance and timely replacement of old and grounded vehicles is required on priority. Field staff are required to be provided with all terrain bikes along with sufficient provisioning for POL for effective mobility and patrolling of the sanctuary. There is need for one pick up rescue vans for evacuation of injured animals and one patrolling vehicle for the Range Officer.

5) **Communication:** In order to have better communication between staff, there is requirement of providing Official smart/android mobiles with SIM cards to the field staff upto the level of Range Officer so that communication between staff could be strengthened. Also staff is required to be sensitized about the use of smart phones.

6) **Protection Equipment:** All latest animal rescue equipments and other required equipments for management of the sanctuary are proposed to be procured so that staff can effectively act when there is any requirement in the field. Moreover, maintenance of Existing equipments like Tranquilizing Guns (Non-functional) including darts, Camera traps with accessories is also very important. Procument of camera traps, night vision binoculars, drones, radio collars for animal set care required to be enhanced. Distribution of crackers, monkey scaring devices etc in and around the Sanctuary.

7) **Infrastructure/Buildings:** Field staff is required to be properly facilitated and provided with proper living/resting places. Construction of Guard huts, BO Quarters and Anti-Poaching Camps sites/Maintenance of existing infrastructure is proposed in the areas where there is no building/infrastructure for the staff and regular maintenance of existing infrastructure is required. Three new guard huts and one BO Quarter is proposed to be constructed at Kamala, Roopnagar and Chinore and BO quarter. Also maintenance of Khanpur guard hut is to be taken on priority to make it functional. Also two watch towers are also proposed to be constructed in compartment 2/P & 3/P at top positions from where it is easy to keep eye on the movement of animals etc.

8) **Camping Equipments:** Camping equipments / field gears such as sleeping bags, tents, carry bags, torches, camera, binoculars, search lights, night vision equipments, GPS et care proposed to be procured and supplied to the field staff of the Sanctuary so that anti poaching camps could be established on regular basis. Moreover, it is also proposed that sites of these camping sites should also be regularly rotated.

9) **Use of advance technology:** Provision for computers, CCTV cameras including accessories, internet facilities, software, weather monitoring equipments, thermo regulators, water quality testing kits, soil quality testing kits, use of modern tool and technology including drones and other advanced technological inputs are proposed to be procured and used for better and efficient monitoring and management of the Sanctuary.

10) **Boundary Consolidation:** The Boundaries on fringe areas, especially near habitations shall be delineated and consolidated by way of installation of boundary pillars (BP) along with construction of boundary wall/chain-link fencing of appropriate height completely during the period of current management Plan.

11) **Staff Welfare:** The optimum staff strength and their basic requirements for day-to-day activities for welfare shall be considered and fulfilled on priority always.

12) **Capacity building:** Staff will be trained in matters related to the implementation of provisions of Wildlife and Forest Acts, Rules and Regulations, identification of wildlife articles in trade, weapon handling and maintenance, intelligence gathering and wildlife crime investigation and follow up in the Hon'ble Courts.

13) **Wildlife Veterinary care:**

- ❖ Establishment of a veterinary hospital with sufficient veterinary staff equipped with latest equipment animal specific is proposed. Moreover, there is urgent requirement of strengthening of veterinary staff and doctors so that veterinary unit can remain active 24 hours.
- ❖ Procurement of tranquilizing equipments.
- ❖ Capacity building and training programmes for field staff posted at veterinary care unit.
- ❖ Deputation of more doctors and staff in veterinary unit.
- ❖ Rescue Vans and Ambulances.
- ❖ Procurement of latest equipments for better diagnosis and treatment of the animals.

14) **Hit and Run Cases on the roads passing through Sanctuary:**

- ❖ The National Highway NH-44 passes through the sanctuary, while the physical footprint of the high way is around 15 kms is relatively small, the *ecological footprint* of the road extends much farther. Direct effects of roads include road mortality, habitat fragmentation and loss, and reduced connectivity to wild animals. The severity of these affects depends on the ecological characteristics of a given species and direct road kill.
- ❖ Although we may not often think of roads as causing habitat loss, a single highway, typical width 10 m. Road cause habitat fragmentation because they break large habitat areas into small, isolated habit patches which support few individuals; these small populations lose genetic diversity and are at risk of local extinction. In addition to these obvious effects, roads create noise and vibration that interfere with ability of reptiles, birds, and mammals to communicate, detect prey, or avoid predators. Roads also increase the spread of exotic plants, promote erosion, create barriers and pollute water sources with roadway chemicals.
- ❖ Despite there being norms of speed limits for the vehicles, number of cases of hit and run are being witnessed resulting in the death of wild animals including Barking Deer, Monkeys, Indian Monitor Lizard, Indian Mongoose, Cobra, Python etc.

- ❖ Construction of under and over passes species specific are required to be constructed along the national highways and other link roads passing through sanctuary.
- ❖ Concerned department looking after the maintenance of these roads be approached for the construction of animal passages as per the species-specific behavior, also the use of camera traps should be done in these passes in order to monitor the movement of animals. In order to freeze the location of these passes natural nallahs leading to Tawi river on the eastern boundary of the sanctuary are the main crossing areas of the wildlife of the area. Passes are required to be established on both the roads passing through the sanctuary. Exact location of these passes can be fixed in consultation with field staff based on their observations.
- ❖ Proper display boards, signages, hoardings are required to be installed along these roads at prominent places in order to aware the public regarding crossing of animals, for not feeding the monkeys, speed limit inside the sanctuary etc. It is proposed that after every 500m the speed limitors/breakers of standard specifications as per national standard for protected areas should be constructed along these roads.

Recommendations of the Sub-Committee on Guidelines for Roads in Protected Areas. An exhaustive set of management measures have been recommended in the NBWL's draft guideline document for the existing roads within protected areas which are reproduced as below:

- ❖ Strong regulations controlling timings and traffic volumes need to be built in for all roads through Protected Areas and critical habitats.
- ❖ Speed reduction is a must to reduce wild animal mortality, and can be achieved through imposed speed limits and speed breakers.
- ❖ Vehicles should not be allowed to stop within Pas.
- ❖ No use of horns within the PA, and no littering.
- ❖ Speed restrictions and other guidelines that spell out rules and avoidance of disturbance to wildlife and habitats along roads in PAs, must be prominently conveyed through well-designed signboards, at entry and exit points and all other relevant locations.
- ❖ Establishment of check posts by the forest department, at both entry and exit points.
- ❖ Wherever possible, natural animal crossings existing across roads should be retained or encouraged. For instance, overlapping tree canopy in closed canopy evergreen/semi evergreen forests is an essential attribute for the movement of arboreal species. Passage to waterholes and daily movements of animals must also be safeguarded.
- ❖ Underpasses: well-designed tunnels, culverts, pipes, and other structures can function as underpasses below roads and bridges, for a wide-range of terrestrial and aquatic species. Underpasses can also be deployed below railway lines highways for passage of large bodied animals, viz deers, leopard etc.
- ❖ During maintenance works on existing roads, the underlying principle should be that work must be carried on in a speedy manner, with minimal disturbance to wildlife and with adherence to all rules and regulations that govern wildlife and Protected areas.
- ❖ No work should be allowed between 6 pm to 8 am (just before dusk to just after dawn).
- ❖ The labour force required for road maintenance must have their camps outside, the concerned PAs.
- ❖ No firewood cutting or fuel collection from within the PA.

- ❖ Waste/debris should not be dumped in the PA/or adjoining rivers/nallahs/waterbodies.
- ❖ No taking of any material like sand, gravel etc from the P A. All materials for construction, road maintenance etc should be brought from outside.
- ❖ No vegetation/tree should be cut or damaged/ during the maintenance. These guidelines are required to be fallowed with respect to Ramnagar Wildlife sanctuary in letter and spirit.

15) **Visitors in Deer Park, Manda:** The deer park/ Rescue center at Manda has tremendous tourism potential. The rescue center has number of mammals' species like Cheetal/Spotted Deer, Sambar, Barking deer, Leopard, Bear, Nilgai and many bird species like Peafowl, eagles, owls etc. The number of visitors is around 1.5 lakh yearly. A Nature Interpretation Centre has been constructed for the awareness programs regarding Wildlife conservation which is proposed to be upgraded with basic facilities and equipments. Enclosures of this park are to be established as per the CZA guidelines and improvement/enrichment activities should be taken up in the park to increase the public attraction.

16) **Morning Walkers:** As the Ramnagar Wildlife Sanctuary is located in the vicinity of Jammu, so a number of local people, who are conscious about their health, go for morning walk in the sanctuary on the pretext that they get fresh air. But they don't realize the fact that early morning is the time when wild animals go for feeding and these morning walkers disturb the wild animals. Also, as the sanctuary is home to leopards so it is advisable for morning walkers not to venture in the sanctuary on the pretext for health or else it might prove to be dangerous for them. Moreover, no study has been made to find out the carrying capacity of the sanctuary and impact on the wildlife of morning walkers on the sanctuary. It is therefore proposed to have regulated movement of people inside the sanctuary and sufficient staff is required to be deployed on all such treks/paths so that people entering sanctuary could not disturb animals and litter the Sanctuary.

17) **Taking over the balance area:** Some portion of notified Sanctuary area is with Forest Department. Three compartments of the Ramnagar wildlife sanctuary i.e., compartment 2/P, 3/P and portions of Co.1/P and 3/R are still under the administrative control of Jammu Forest Division (territorial) which are required to be managed at par with the rest of the sanctuary. In this regard it is proposed to take over the balance area of the sanctuary from the territorial department and to be managed keeping in view the wildlife of the area on the similar lines of the portion which is with Wildlife Protection department.

18) **Extention of sanctuary area:** Since this sanctuary has a very little area that as per notification it is 30.50 sq. kms but as per GIS calculations the area of the sanctuary is coming around 12.15 sq kms only. There is a forest area adjoining to this sanctuary in the north of its boundary which is known as Keran wali Rakh which is being administered by territorial department. Thus, by adding new areas to the sanctuary its management with respect of wildlife and biodiversity could be enriched by way of better management. Department should take up matter with Territirial department for adding this area to sanctuary. Moreover, the existing small corridor between Nandini wildlife sanctuary and Ramnagar Wildlife Sanctuary is required to be protected and developed. It is therefore, proposed to protect and develop this corridor so that animal could move between these protected areas without coming into conflict with human population.

19) **Settlement of rights under Forest Rights Act (FRA), 2006:** A comprehensive exercise for settlement of rights of the graziers under the provisions of the Forest Rights Act (FRA), 2006 has been initiated by the Govt by way of constitution of different state level, district level and sub division level committees. Claims will be submitted by the applicant in the concerned Gram Sabha. The exercise must have involvement of multiple stakeholders including prominent members/elders from the graziers' community, legal experts, FRA experts from NGOs, policy makers and independent observers. This exercise is required to be conducted on priority before any management initiatives are undertaken. After the settlement of rights those who are unauthorisally living/grazing their cattles are required to be shifted out of the sanctuary area to some other forest land so that biotic pressure on the sanctuary could be reduced and protection and management of Sanctuary could be done in a better way. During winter the number of domestic cattles increases inside the protected area which cause wild animals to rush outside the area which cause conflicts. Thus, settlement of rights is to be taken up on priority.

20) **Replacement of open/naked conductor wires with insulated wires:** The sanctuary being located adjacent to Jammu city, there are number of electric lines passing over the sanctuary. Some electric lines are low lying and some times touches the below growing trees tops. These may harm to any wild animal. Also, sometimes due to sparking/short circuit leads to forest fires. There are clear directions/circulars that electric lines passing through any protected area should be insulated wires and regular monitoring and maintenance should be done to all such lines passing through. Matter needs to be taken up with concerned PDD Department so that replacing of open conductors wires with insulated conductor wires be initiated on priority basis.

6.6.2 : Theme Plan for Habitat Improvement:

1) **Habitat improvement and Management:**

- ❖ The habitat is proposed to be restored by way of weed control, plantation, patch sowing, grass slips and low-cost seed balls.
- ❖ Construction and maintenance of appropriate water holes and provisioning for water supply to water holes during dry season by water tanks.
- ❖ The landslide prone areas to be treated by planting soil binding species like Agave, bamboo, grass species, and local fodder plant hard wood cuttings such as Grewia, Moringa, Mulberry, Bauhinia, Terminalia spps. etc.
- ❖ Habitat enrichment activities like developing stone heaps, wooden log mounds, hummas mounds etc which are suitable for various nocturnal animals as well as reptiles and insects etc are required to be undertaken in the moist and at the places of their presence in addition to the habitat improvement activities for big animals like leopard, barking deer, neelgai, wild boar etc.
- ❖ The eradication of weeds should be followed by plantation of native species, grass slips, fruits and fodder saplings like Grewia, Bauhinia, Siris, Moringa, Cassia fistula, Terminalia spps etc.
- ❖ All type of fencing erected inside the sanctuary is required to be removed in a phased manner so that animals could move freely without further fragmentation of the area.
- ❖ Removal of exotic species from the PA in a phased manner and substitution by plantation of native species.

2) **Management of Weeds:**

- ❖ Eco-restoration activities will be taken up immediately in weed eradicated areas.
- ❖ Continuous monitoring shall be done in areas where weeding was once done. Studies on the dependence of certain species of birds and animals on these weeds should be conducted.
- ❖ Possibility to be worked out of making use of the materials from these weeds by the local people with the help of necessary training is proposed.
- ❖ Weed management in the plantations and other degraded forest areas in the buffer zone can be converted into a labour generating programme for the local communities.
- ❖ Concentrated and regular efforts are required to be given so that area could be freed from the weed once for all.
- ❖ Dried Lantana refuse should also be put to use in gully plugging, brush wood fencing, also locals should be trained to make furniture items from lantana waste.

3) **Management of Plantations and Grasslands:**

- ❖ The weed removal shall be followed by plantation of saplings of fruits, fodder and palatable grass slips of *Seteria sphaceleta, Panicum maximum, Cenchrus ciliaris, Cenchrus setigrus, Pennisetum purpureum, Pennisetum pedicellatum* to ensure the sustained availability of grasses for young fawn/calves.
- ❖ The local leguminous species are to be encouraged alongwith grass slips.

4) **Management of waterholes and ponds:** The existing ponds and water holes are required to be properly maintained. The plan proposes the construction of water-holes at some of the selected spots in the eco-restoration zone i.e. Co. 1/P, 2/P, 3/P, 2/R & 3/R. The exact location of these water-holes should be determined on the basis of field assessment and animal movement. These water holes to be constructed wherever the water availability is inadequate and feed is available in adequate quantity preferably at spots where its recharging can be done during dry spell artificially. These water holes must be shallow and not constrain the movement of animals. There should be proper provisioning for recharging and maintenance of these waterholes.

List of Natural/Artificial Water Sources in Ramnagar Wildlife Sanctuary

S.No.	Type of Water body	Source	Location	Geo-coordinates
1	Pacca pond	Leakage of water supply pipe	Co. 1/P	N 32º 46' 21.72'' E75º 51' 50.62''
2	Pacca pond	Rain water	Co. 1/R	N 32º 45' 55.41'' E75º 52' 15.30''
3	Pacca pond	Leakage of water supply pipe	Co. 1/R	N 32º 45' 07.59'' E75º 52' 00.80''
4	Pacca pond	Leakage of water supply pipe	Co. 1/R	N 32º 45' 06.44'' E75º 52' 13.08''
5	Pacca pond	Leakage of water supply pipe	Co. 1/R	N 32º 45' 55.26'' E75º 52' 13.63''

6	Kaccha pond	Water overflow	Co. 1/R	N 32º 45' 02.10'' E75º 52' 10.48''
7	Pacca pond	Water connection	Co. 1/R	N 32º 45' 42.08'' E75º 52' 19.95''
8	Kaccha pond	Leakage of water supply pipe	Co. 1/R	N 32º 44' 59.40'' E75º 52' 00.01''
9	Pacca pond	Leakage of water supply pipe	Co. 1/P	N 32º 45' 08.17'' E75º 52' 02.77''
10	Kaccha pond	Rain water	Co. 4/R	N 32º 45' 46.48'' E75º 51' 43.54''
11	Pacca pond	Rain water	Co. 4/R	N 32º 45' 35.47'' E75º 51' 36.31''
12	Pacca pond	Rain water	Co. 4/R	N 32º 45' 33.67'' E75º 51' 37.30''

5) **Habitat Assessment studies:** Regular studies are proposed to be conducted to understand the dynamics of biomass and habitat quality. The studies shall focus on determining the availability of feed, water and overall conditions required to support the existence of the important wildlife species. Studies must also focus on ways to curb the propagation of unwanted weeds in the habitat which otherwise degrade the habitat.

6) **Health Monitoring (Vaccination of fringe animals):** In order to keep the wild animals healthy and fit, regular health monitoring of domestic animals living in fringes should be conducted on regular basis. They should be properly vaccinated for all type of communicable diseases so that wild animals could not get affected due to their diseases. Animal Husbandry department should be approached for regular survey of the fringe areas in order to check the health of domestic animals living in the fringes.

7) **Sanctuary as sink for rescued animals:** Number of rescued animals are brought to Manda Rescue Centre for treatment from all over the Jammu province due the reason that veterinary facilities are available at Manda Rescue Centre only. Also Manda control room is rescuing number of animal from in and around the Ramnagar Wildlife sanctuary. Majority of the animals rescued by the Manda Control Room are reptiles and birds. These rescued animals are being released in Ramnagar wildlife sanctuary. Therefore, this sanctuary can be developed as a sink for rescued animals especially birds and reptiles. Keeping in view the rescued animals special habitat improvement activities are to be taken in the area so that these animals can easily adopt in the area.

6.6.3 : Theme Plan for Fire Protection:

i) **General guidelines for preparation and implementation of Fire Management Plan:**

- ❖ Identify the cause and consequences of fire.
- ❖ Provide adequate training to fire-fighting squad in fighting fires and self-defense.
- ❖ Develop infrastructure by procuring necessary equipment and materials required for fire protection based on annual assessment.

- ❖ Ensure timely implementation of interventions.
- ❖ Using existing roads and patrolling paths as fire lines.

ii) Fire Management Strategies:

a) Fire Prone Areas:

- ❖ **High fire prone areas:** Co. 1/R, 2/R &3/R are high prone areas as through these compartments roads are passing. There remains the risk of fires due to live cigrettes thrown from the running vehicles.
- ❖ Low fire prone areas: Co. 1/P, 2/P,3/P & Co.4/R, are away from any habitations and human interferences therefore are less prone to fires except in fringes.

iii) Deploying fire watchers:

- ❖ **Fire watchers** will be engaged throughout the season for efficient fire protection activities. The number of persons engaged for ths purpose will be decided based on the intensity of fire and severity of drought.
- ❖ **Construction and maintenance of fire lines:** Construction and maintenance of fire lines should be a regular exercise by the department. The existing roads and treks passing through the sanctuary should be treated as existing fire lines and these should be regularly cleared and keep safe from inflameable substances. Appropriate width of these fire lines should be maintained all along the fringes and along the boundary shared with the habitations.

iv) Awareness and Training:

- ❖ Awareness campaigns are to be arranged for fringe area people and representatives of societies on the impact of fires on forests. This may be done by mass involvement of people, talks, information display boards, banners, etc. Panchayats based awareness campaigns highlighting fire preventive and containment measures among children and youth in the localities should be arranged during the fire season. Creative programmes in this regard should be conducted.

v) Training programmes:

- ❖ Training programmes for staff, watchers and other members of the community involved in fire protection should be organized.

vi) Fire watchtowers and communication network:

- ❖ The present infrastructure and communication facilities will be made use of in fire protection to prevent the fire incidents and to mobilize additional forces in case of necessity. There is requirement for construction of few watchtowers and observation posts in the remaining areas for proper watch and ward.

vii) Firefighting equipment:

- ❖ The equipments like gum boots, fire resistant suits, masks, helmets with torches, fire exintguisher etc. may be procured and made available to the fire management groups for effective tackling of fire incident.

viii) Fire Reporting/Mapping:

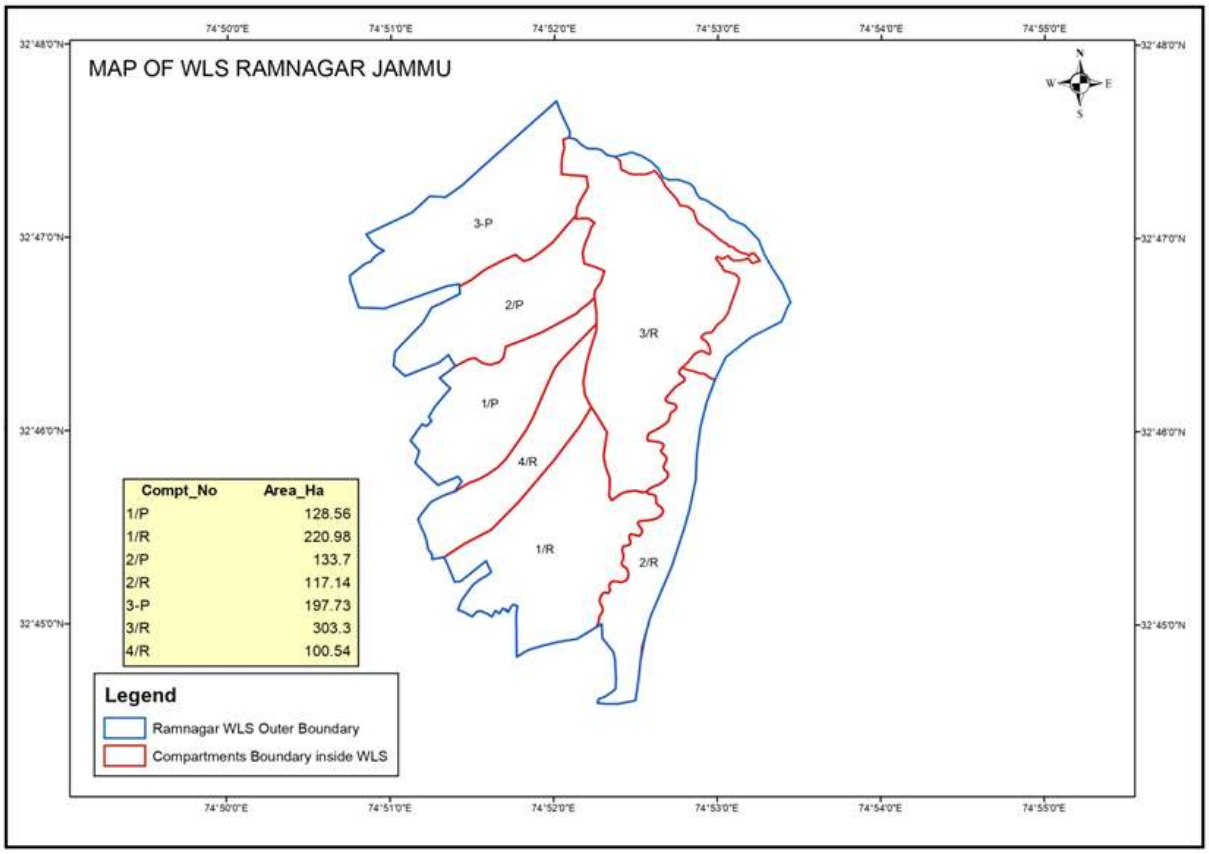
- ❖ The daily reporting of the fire incidents should be recorded as per format given in the control form.

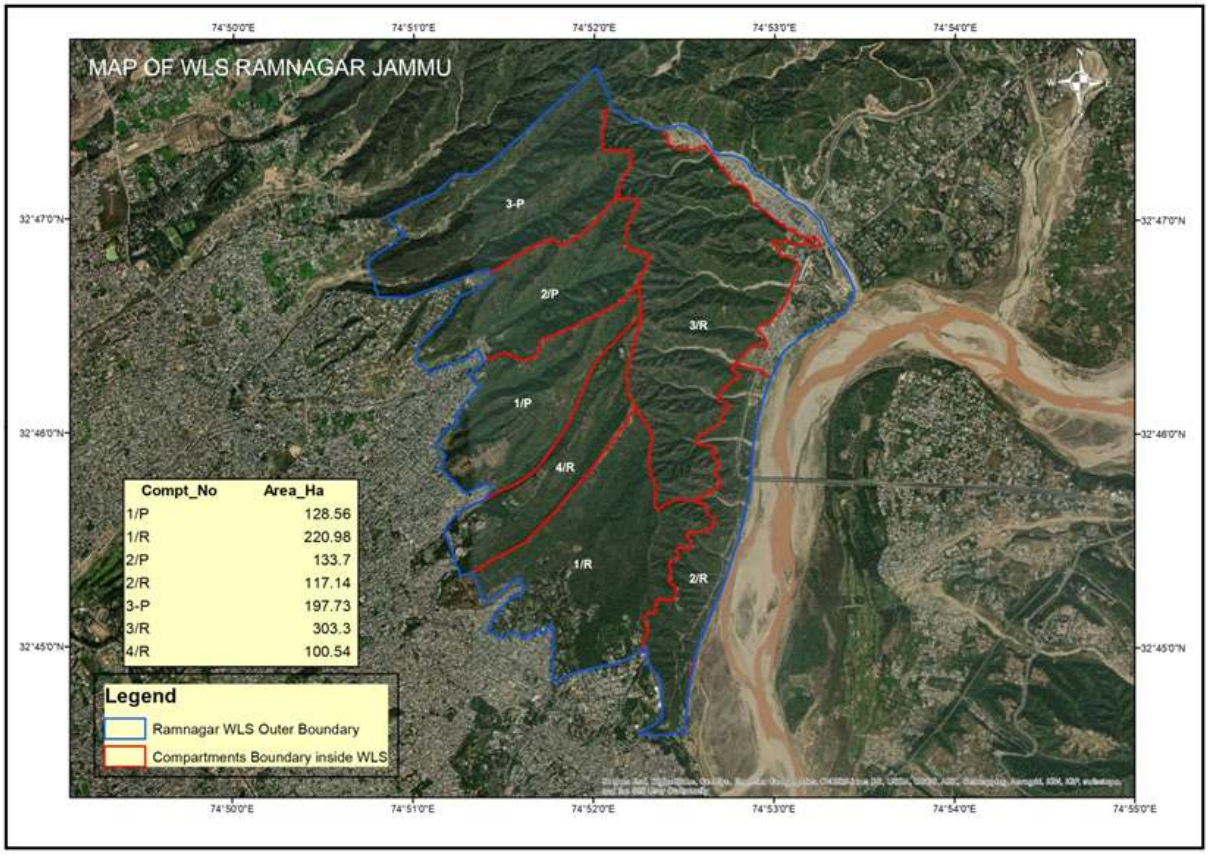
6.6.4 : Theme plan for Watershed Management/Catchment area treatment:

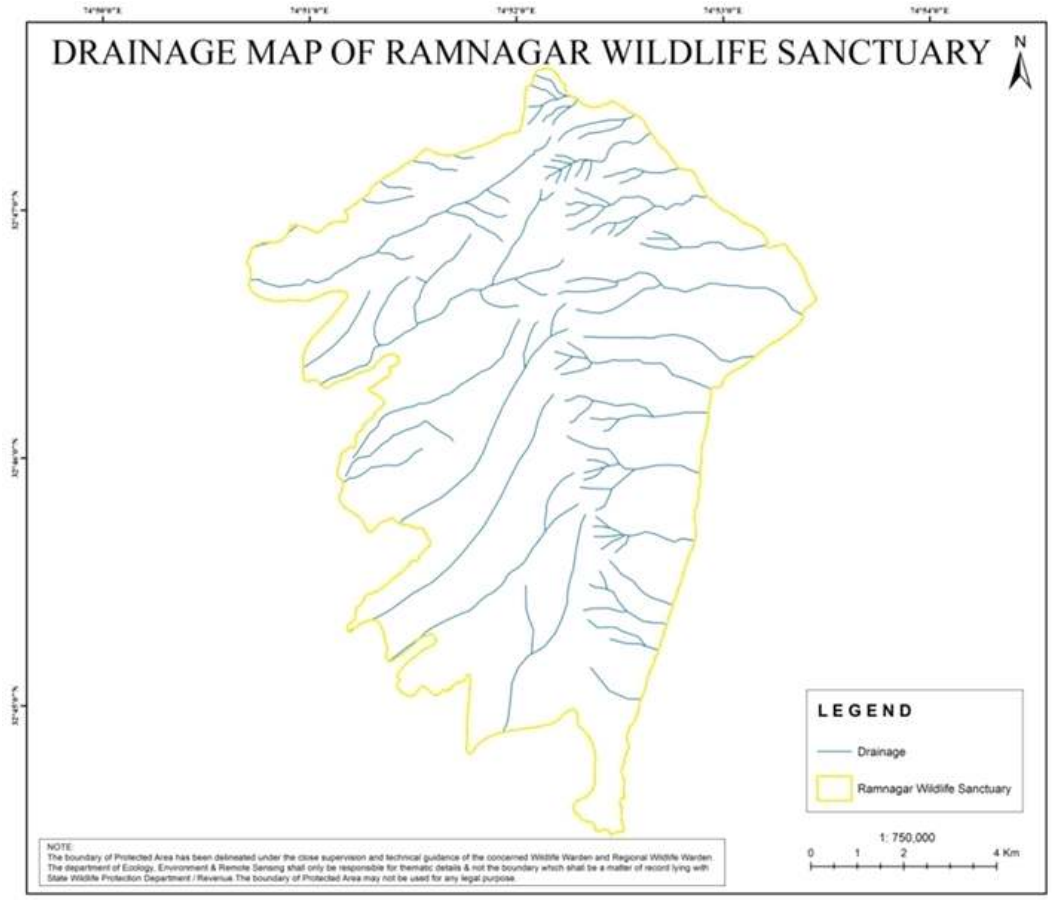
- There are five major seasonal nallahs draining out of the sanctuary which are being converted into small drains after they enter in city area due to encroachments and constructions. Due to construction and blockage of natural nallahs there is every apprehension that this may invite flash flooding in the city. Matter is required to be taken with Municipality so that sufficient opening/way of water/flood to be kept keeping in view the rain and flood. This may create flooding in city area at any time. One such incident which happened in 2018 at Janipur (Daily excelsior lane) when due to choking of the nallah, run off water entered into the houses of the area and caused huge damages to the property of the locals of the area. There is emergent requirement for treating the catchments of all such nallahs by way of construction of check dams and other structures which can slow down the run off and ensure maximum percolation.

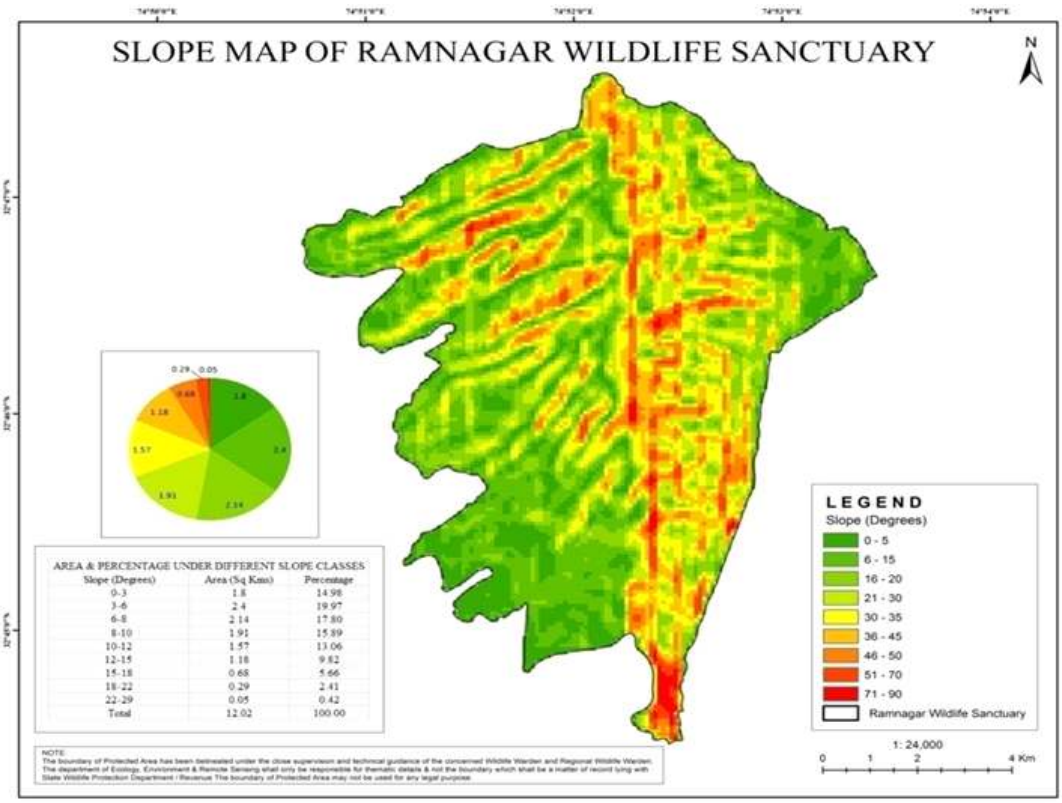
Following activities are proposed to treat these micro as well as macro catchments.

- Mapping and Monitoring of water sources – water holes, check dams, Ponds, streams, natural nallahs and other natural sources.
- Micro as well as macro-Catchments of these seasonal nallahs draining out of the sanctuary are required to be treated from top to bottom in order to reduce the erosion of the top soil of the area, to check landslides, to reduce run off water during rainy seasons.
- Encouraging local inhabitants, Muncipalities, Revenue authorities, irrigation & Flood control departments to restore these natural drains to their original size out of the sanctuary boundary.
- Updating of drainage map and vegetation map on regular basis.
- Construction and maintenance of water properly designed harvesting structures suitable for the area.
- The landslide areas shall be treated by crate works and plantation of soil binding species like *Agave spp., Bamboo spp.,* Hardwood cuttings of fodder trees like *Bahunia spp., Moringa spp., Bamboo spp.* etc.
- Concentrated and scientific efforts are required to be taken up in all the micro-catchments.
- Proper scientific structures made of concrete should be designed and constructed in the lower portion of these nallahs in order to slow down the excess run off.
- The seasonal nallahs like Janipur Khad, Khanpur nallah, Chinore nallah, Siltian nallah etc are draining out in the city area, where the span of these nallahs has been reduced to small drains due to encroachments within the city. Therefore, inorder to reduce the run off and its pressure and flow these nallahs shall be treated by construction of series of concrete check dams, DRSM stuctures, crates, along with plantation of soil binder species which can control soil erosion and increase percolation of water into the soil during the plan period. Along these nallahs and in the catchment bamboo plantation is proposed to taken up which can prove helpful in percolation of extra run off including reducing its speed/velocity.


MAP OF WLS RAMNAGAR JAMMU
74°50'0"E
74°51'0"E
74°52'0"E
74°53'0"E
74°54'0"E
74°55'0"E
32°48'0"N
32°47'0"N
32°46'0"N
32°45'0"N
N
W
E
S
3-P
2/P
3/R
1/P
4/R
1/R
2/R
Compt_No Area_Ha
1/P 128.56
1/R 220.98
2/P 133.7
2/R 117.14
3-P 197.73
3/R 303.3
4/R 100.54
Legend
Ramnagar WLS Outer Boundary
Compartments Boundary inside WLS


MAP OF WLS RAMNAGAR JAMMU
74°50'0"E
74°51'0"E
74°52'0"E
74°53'0"E
74°54'0"E
74°55'0"E
32°47'0"N
32°46'0"N
32°45'0"N
3-P
2/P
3/R
1/P
4/R
1/R
2/R
Compt_No Area_Ha
1/P 128.56
1/R 220.98
2/P 133.7
2/R 117.14
3-P 197.73
3/R 303.3
4/R 100.54
Legend
Ramnagar WLS Outer Boundary
Compartments Boundary inside WLS


DRAINAGE MAP OF RAMNAGAR WILDLIFE SANCTUARY
N
LEGEND
Drainage
Ramnagar Wildlife Sanctuary
1: 750,000
0 1 2 4 Km
NOTE:
The boundary of Protected Area has been delineated under the close supervision and technical guidance of the concerned Wildlife Warden and Regional Wildlife Warden.
The department of Ecology, Environment & Remote Sensing shall only be responsible for thematic details & not the boundary which shall be a matter of record lying with
State Wildlife Protection Department / Revenue.The boundary of Protected Area may not be used for any legal purpose.


SLOPE MAP OF RAMNAGAR WILDLIFE SANCTUARY
N
0.29
0.05
0.68
1.18
1.57
1.91
2.14
2.4
1.8
AREA & PERCENTAGE UNDER DIFFERENT SLOPE CLASSES
Slope (Degrees) Area (Sq Kms) Percentage
0-3 1.8 14.98
3-6 2.4 19.97
6-8 2.14 17.80
8-10 1.91 15.89
10-12 1.57 13.06
12-15 1.18 9.82
15-18 0.68 5.66
18-22 0.29 2.41
22-29 0.05 0.42
Total 12.02 100.00
LEGEND
Slope (Degrees)
0 - 5
6 - 15
16 - 20
21 - 30
30 - 35
36 - 45
46 - 50
51 - 70
71 - 90
Ramnagar Wildlife Sanctuary
1: 24,000
0 1 2 4 Km
NOTE:
The boundary of Protected Area has been delineated under the close supervision and technical guidance of the concerned Wildlife Warden and Regional Wildlife Warden.
The department of Ecology, Environment & Remote Sensing shall only be responsible for thematic details & not the boundary which shall be a matter of record lying with
State Wildlife Protection Department / Revenue.The boundary of Protected Area may not be used for any legal purpose.

6.6.5 : Theme plan for Awareness:

Awareness Programs:

- Relevant awareness campaigns to be organized for the local communities and the sanctuary visitors so as to enhance their awareness regarding wildlife and Protected areas and bring them to play an important role in participatory conservation.
- The communities shall be made well aware of how to respond when (a) A wild animal is seen in the forest while grazing livestock. (b) When a wild animal is seen around the village (c) If a wild animal enters the village/building. (d) If a wild animal attacks/kills livestock. (e) If the wild animal attacks humans.
- People must be sensitized about seasonability of the conflict and the do's and don'ts that one must strictly abide by during seasons of high conflict. If extra care is being taken during critical months, the loss of life and property could be minimized.
- Awareness campaigns may be arranged for fringe area people and representatives of societies on the impact of fires on forests. This may be done by mass involvement of people, talks, information display boards, banners, etc. Panchayats based awareness campaigns, highlighting fire preventive and containment measures among children and youth in the localities should be arranged during the fire season.
- Creative programmes in this regard should be conducted like nukkad nataks, seminars, rellies, taking on tour to some stake holders, like children, nomad members, prominent locals etc to some other national parks and sanctuaries.

Distribution of awareness material:

For creating awareness among the students and other literate locals living along the fringes of sanctuary, proper awareness material in the form of posters, brouchers, stickers etc can be published and distributed. Small vedio, audio documentaries can be prepared on the wildlife and released on the various social media platforms so that public at large could be made aware regarding the wildlife, its habits and need for its conservation.

CHAPTER - 7
HUMAN-WILDLIFE CONFLICT

7.1 Human-Wildlife conflict:

Human-Wildlife conflict refers to the interaction between human and Wild animals and resulting into negative impact on human and his resources or animal and its habitat. Conflicts between human and animals have occurred since the dawn of humanity. However, it has intensified ever more frequently in recent times.

With changing times and an ever-increasing population, the lines between human settlements and forests have started to blur, resulting into more conflicts. The result of this conflict is severe which result into the loss of crops to farmers, human beings getting injured or killed and concerns for wildlife conservation as well.

Several strategies have been employed by people to minimize their loss. Wildlife department is using different tactics to minimize these conflicts. However, the most of these methods and strategies have been proved ineffective in minimizing the conflicts.

This has increased a need to understand why and how such conflicts happens and what could be done to minimize these conflicts and protection of both human and animal.

7.2 Kind of Human-Wildlife conflicts:

The incidents of Human-Animal Conflicts can be categorized into following major types:

- Human beings get killed or injured by wild animals.
- Livestock/Cattle reared by humans get killed or injured.
- Crop raised by man get damaged.
- Wild animals get killed or injured.

7.3 Causes of conflict:

- **Fragmentation and shrinking of habitat:** The conversion of forest land for non forest purposes, result into wildlife habitat shrinking. This makes that landscape unavailable for wild animals as their needs are not fulfilled. Resulting into the animals straying out of habitat in search of food, water or shelter bringing them in conflict with humans.
- **Road Kills:** In recent times, expansion of road network through Wildlife areas has resulted in animals getting killed or injured in accidents on roads or railway tracks. There is NH-44 passing through the sanctuary and one link road is also passing through the sanctuary. There is heavy vehicular traffic on these roads day night and there are no speed breakers installed. Over speeding sometimes causes road kills mostly of reptiles, monkeys and sometimes big animals also.
- **Land use transformations:** In recent times, with growing demand for food there is rapid conversion of forest lands into farm fields for cultivation. Also, forest is being cleared for

mining and developmental activities resulting in destruction of habitat of wildlife. This results into herbivores straying out of the forest and causing distruction of crops.

- **Infestation of wildlife habitat by weeds:** Infestation of wildlife habitat by the invasive exotic weeds like Lantana, Parthenium etc. have resulted in decreased availability of edible grasses for the wild herbivores. As a result, herbivores come out of forest area in search of food/fodder and cause depredation of agricultural crops on the fringes
- **Impact of human activities: -** The increasing population has led to many human settlements coming up near the peripheries of protected areas and encroachment in the forest lands by local people for cultivation and collection of food and fodder etc, thus increasing pressure on limited natural resources in the forests.
- **Livestock grazing:** Livestock grazing in the forest areas has increased human-animal conflicts as carnivorous are attracted to easy prey thus becoming the direct enemy of man. Livestock grazing has also led to the shortage of food for wild herbivores as they have to compete with livestock for food.
- **Decreased prey base caused by poaching of herbivores:** Due to illegal poaching in forest areas the prey base is declining as a result carnivore are forced to roam into nearby villages in search of food. This leads to the killing of cattle by these carnivores, thus bringing them into conflict with humans.
- **Feeding of wild animals:** Local people and tourists feed the animals with their food especially monkeys along the road sides which result in changing their eating habits and cause conflicts when not fed adequately.
- **Dumping of garbage:** Sometimes people living in the fringe areas dump their waste food and other garbage adjoining to the boundary of the sanctuary which attracts the animals and leads to human animal conflicts.
- **Unregulated movement of locals inside the sanctuary:** Internal roads and treks are being used by the locals for morning and evening walks. People walk in groups and sometimes make noises which scare the animals and in search of safe place sometimes animals enter in conflicts.
- **Kite flying:** People are using banned Chinese thread for kite flying which is very strong, not easly decomposable and sharp thread which is sharp like a blade/knife. Flying birds when come in contact with these threads get seriously injured and sometimes get entangled. Most of the times these threads remained hanging from the towers, buildings and trees, birds flying in the city and forests get entangled in these threads and got injured and sometimes got entangled on trees and dies during struggle to get free. Number of such incidents are increasing day by day. Therefore, proper awareness drives through different mediums are required to be arranged so that people could understand the ill affects of these threads.

7.4 Consequences for humans:

The aftermaths of the human-wildlife conflicts are more serious in the tropics and in developing

countries where livestock holdings and agriculture are an important part of livelihood and income of people in rural areas.

- **Injury or loss of human lives:** People living near forest areas and buffer zones are mostly at risk of attack by carnivores, straying out of forest areas in search of food.
- **Crop depredation:** The destruction of crops by wild animals like wild boar etc. can result in loss of income of rural households and it can also threaten the household food security.
- **The killing of livestock:** The killing of livestock by carnivores destroys income source of agro-pastoralists who depend exclusively on cultivation and production of livestock. The loss of a family's small herd of cattle to predators can effectively destroy that family's wealth and way of life.

7.5 Consequences for wildlife and environment:

- **The killing of wild animals:** The killing of wild animals in retaliation for incidents of human-wildlife conflict is a common reaction, even though the identification of the real culprit is seldom possible. This has also resulted into wiping out of the whole population of some species from certain areas and also endangering their existence.
- **Destruction of habitat:** Due to increase in demand for land for housing and cultivation, lands with good tree cover are increasingly being transformed into farm fields and housing projects etc. resulting in the destruction of habitat for wildlife outside protected areas.
- **Destruction of an ecosystem:** Due to the killing of wild animals and diversion of forest land for non-forest purposes many ecosystems across the world are on the verge of being destroyed. Therefore, diversion of forest area for developmental products may also lead to human-animal conflicts as destruction of habitat leads to migration of wild species to safer places which leads to conflicts.

7.6 Proposed strategies:

Department has already taken up many possible mitigation measures, such as construction of chain-link fencing of sensitive areas, establishment of 24x7 Control room for rescue operations, engaging local labour for man-animal conflict resolution, additional staff deployment, improving communication facilities, public awareness programmes, installation of "Do's & Don'ts" boards etc. to deal with human-animal conflicts.

Following measures are proposed to be taken up during the plan period for addressing human wildlife conflict issues.

- In fringe areas of Sanctuary cracker shall be distributed to the locals to scare wild animals from entering habitations.
- Construction of chain-link fencing in encroachment prone area and the areas from where wild animals enter cities/adjoining habitations.
- Bio fencing by planting Agave, Wild rose, Euphorbia spp, Bamboo spps. etc at the areas where fencing could not be taken up.

- ❖ Provision for deploying animal scaring squads consisting of staff, watchers and local people with vehicle and arms.
- ❖ Provision for improving existing forest roads, trek paths and construction of new one.
- ❖ Effectivity of existing conflict mitigation methods should be assessed and necessary modifications shall be made.
- ❖ Monitoring of problematic animals should be carried out.
- ❖ Installation of camera traps at the senstive sites from where the animals cross towards habitations.
- ❖ Habitat improvement activities will be taken up in the buffer areas to provide sufficient space and fodder within Sanctuary.
- ❖ To enlist public support in conservation, awareness programs should be conducted for general public and media persons on various aspects of human-wildlife conflict issues.
- ❖ Encouraging people to change crop patterns.
- ❖ Use of technology like drones, camera traps, thermal scanners, etc is proposed to be enhanced.
- ❖ Installation of display boards and hoardings regarding do's and don'ts along the sensitive areas and along the roads.
- ❖ Strengthening of staff and equipments in the Rescue Centre and Control Room Manda.
- ❖ The management shall provide professional counseling support of affected communities to calm down the psychological impact, post conflict incident.

Human-animal conflicts have bad consequences not only for the mankind and the society but also for the wildlife. Though we cannot completely avoid the human-animal conflict, it can be minimized and controlled to a large extent by adopting following preventive measures if adopted sincerely.

7.6.1 To control poaching : Poaching of wild animals should be strongly checked so that the number of wild animals can be stabilized and equilibrium between number of prey animals and predators in the forest ecosystem can be maintained. There are very rare incidents of poaching being reported, but regular patrolling, engaging informers/whistleblowers and regular awareness programs are required to be taken up sincerely. Surprise nakkas along the sensitive areas are also to be established frequently in order to completely curb poaching and wild trade.

7.6.2 To strengthen the Wildlife corridors and passages : The National Highway NH-44 passes through Ramnagar Wildlife Sanctuary, which fragments the Sanctuary and restricts the movement of the animals towards the river Tawi which is the only perennial source of water. The movement of heavy traffic on this highway obstructs the wildlife movement and sometime leads to death of reptiles, wild animals like monkeys and other big animals as well. Therefore, it becomes necessary to make safe passages for the movement of wildlife across highway. Wildlife corridors provide a safe pathway to animals in the human-inhabited and developed areas. This will not only protect the animals from road kills but it can also keep them away from the human population thus prevent the man-animal conflict.

Clearly the most corridor-friendly road policy is to avoid building any new roads in a wildlife corridor. Where there are over-riding reasons to build or expand roads in corridors, wildlife crossing structures can facilitate wildlife movement across roads, these structures include wildlife overpasses &

green bridges, bridges, culverts, and pipes. While many of these structures were not originally constructed with ecological connectivity in mind, many species benefits from them (Clevenger et al. 2001; Forman et al. 2003). No single crossing structure will allow all species to cross a road. For example, rodents and reptiles prefer to use pipes and small culverts, while deer species prefer vegetated overpasses or open terrain below high bridges. A concrete box culvert may be readily accepted by a leopard and foxes. but not by a deer or any antelope. Small mammals prefer small culverts to wildlife overpasses (McDonald & St Clair 2004).

Wildlife underpasses include via-ducts, bridges, culverts, and pipes, and are often designed to ensure adequate drainage beneath highways. For ungulates such as deer that prefer open crossing structures, tall, wide bridges are best. The well-designed and located *culverts* can mitigate the effects of busy roads for small and medium sized mammals (Clevenger et al. 2001: McDonald & St Clair 2004).Construction of under and over passes species specific are required to be constructed along the national highways and other link roads passing through sanctuary.

7.6.3 Awareness Programmes : It is important to create awareness among people and sensitize them about the Do's and Don'ts in the forest areas to minimize the conflicts between human and animal. People should be educated about the need of conservation. For this a proper communication strategy in local dialect should be developed based on it following means can be used as tools to achieve the desirable results: -

1. Regular interaction with villagers.
2. Wildlife days celebration.
3. Meetings, workshops, rallies etc.
4. Film shows, nukkad-nataks etc
5. Broachers, pamphlets, posters etc.
6. Rewards for good conservation initiatives.

7.6.4 Solar Fencing around agriculture fields : Agriculture fields situated near wildlife habitat/forest areas can be protected by way of traditional stone fencing, hedge-fencingas well as solar fencing.

7.6.5 Paying Compensation to the people : Compensation should be paid promptly to the victims of wildlife attack so as to maintain harmony between human and wildlife. In case of crop loss/ damage due to wild animals, there is requirement for taking up the matter with higher authorities for framing a policy for crop compensation damaged due to wild animals.

7.6.6 Eco-development activities : Eco-development activities in villages around Protected Areas to have the cooperation of the local community in the management of the Protected Areas can also help in minimizing the conflict. Such activities are required to be undertaken in consultation with local communities.

7.6.7 Eco-Tourism : Eco-Tourism in the wildlife areas can also help to create an alternate source of income for local people and boost the local economy. Thus it can also help in minimizing human-animal conflict on account of crop damage or livestock killing.

7.6.8 Use of ICT : Information communication technology tools like GPS, high-frequency

thermal recorders, radio collars, camera traps, radio collars, drones etc. can help to track the movement of animals and warn the local population. It can also monitor hotspots of man-animal conflict. Identifying conflict hot spots helps to pinpoint required manpower and funding to pro actively address the issue of man-animal conflict.

7.6.9 Radio collaring: A collar with an attached radio transmitter is put on a wild animal so that its movements in its natural habitat can be remotely monitored. Radio tracking involves fitting the study animal with a radio collar. These collars are designed to minimize impact on the animals behaviour and to maximize their detectability. The use of tracking collars is one of the most common method of monitoring wild animals.

1. It allows researchers and managers to collect baseline data like home range sizes, daily movements, behavioural data and diet pattern of wild animals.
2. They come in a variety of belt and battery sizes; in general, the weight of the collar should be no more than 4 to 5 percent of the animal's body weight for mammals, depending on the species. For example, the weight of a collar for a wild dog shouldn't exceed 450 grams.

Depending on the species of animal, the collars can be customized with sensors to recognize different movement activity, temperature and even mortality. When the movement sensor detects no movement, after a pre-programmed period of time, it changes the pulse rate to a higher or lower rate indicating change in behaviour (e.g., resting or stationary). In Ramnagar Wildlife Sanctuary, Radio collaring of RET and Rescued species is prescribed for effective Monitoring of Wildlife.

7.7 Strengthening of Rescue/Control room:

The Recue/Control Room Manda is dealing with all the human animal conflicts taking place in and around the sanctuary area. Teams are giving their best to deal with all such operations. In order to have minimum response time, control room is required to be adequetly equipped with all latest tools for animal rescue, safety kits for the team and proper communication devices. Teams are also required to be provided regular weapon and equipment handling trainings. For strengthening of existing man power of the control room, taking the assistance of forest protection force personals is also proposed.

7.8 Strengthening of Rescue centre:

Animals rescued during man animal conflicts may get injured during rescue operation, thus require treatment and proper care and isolation from other animals. In this regard Rescue Centre Manda is required to be strengthened with animal specific structures/enclosures equipped with basic facilities for feeding, drinking etc so that animal could be relieved from mental trauma and can recover at the earliest.

7.9 Identification of Conflict hotspots:

Since, the sanctuary is surrounded by the habitations of Jammu city as well as villages, therefore the incident of wild animal coming into conflict with humans are supposed to happen due to porous boundaries of the sanctuary. However, the reporting of such incidents is more in city areas than in

villages. The conflicts due to reptiles and wild boar are more in city area, however, the conflicts due to leopard, wild boar and monkeys are more in the villages. Therefore, identification of hot spots of conflicts and working on the possible mitigation measures is required to be taken up keeping in view the species of conflict.

Detail of Human-Wildlife conflicts incidents reported (due to leopard) for the last five years in and around Ramanagr WLS

S.No.	2015	2016	2017	2018	2019	2020	2021
Death	-	-	-	-	-	-	-
Injury	-	-	-	-	03	-	03
Compensation paid	-	-	-	-	-	-	-

Incidents of conflicts due to other species are not being compiled by the Department. It is therefore proposed that all details regarding all type of human-wildlife conflicts like conflicts due to snakes, wild boar, nilgai, porcupine etc is required to be recorded by the Department for further planning in the matter.

CHAPTER - 8
RESCUE CENTRE MANDA AND VETERNIARY CARE

8.1 Rescue Centre Manda:

Rescue centre is a place where injured and rescued wild animals are kept for sometime, provided injury and animal specific treatment by the expert veterinary doctors and then released in their natural habitats keeping in view the conditions of the treated animals.

Rescue Centre Manda is established and maintained on the similar lines. Animals rescued during human-animal conflicts may get injured during rescue operation, thus require treatment and proper care and separation from other animals. The injured animals are brought to this centre from all over the Jammu region and are being provided treatment by the Veterinary Surgeon of the department and then kept under observation in the animal specific recovery enclosures. As the condition of the animal improves and if it is fit for its release in natural habitat, then released in the same territory or near to that from where the animal was rescued so that it could adjust easily after being reintroduced in the area.

Manda Rescue Centre is the only Recue Centre where veterinary facilities are available in Jammu region, therefore, it isover burdened due to shifting of rescued injured animals all divisions of Jammu Region to this centre. Moreover, old enclosures constructed for the animals are not as per CZA norms. Accordingly Rescue Centre Manda is required to be strengthened with animal specific structures/enclosures equipped with basic facilities for feeding, drinking etc as per CZA norms for early recovery.

8.2 Objectives of Rescue Centre:

1. To provide appropriate treatment to the rescued injured wild animals.
2. To house wild animals which are declared man-eater and those unfit to be released in the wild.
3. To provide a temporary shelter/quarantine to recued wild animals till they are fit to be released back in wild.
4. To provide shelter to the wild animal who became incapable to survive in wild due to injury/infirmity.

8.3 Facilities available in the Rescue Centre:

Veterinary Unit : A small veterinary unit is established at Manda having one small Operation Theatre and one recovery room with bare minimum veterinary facilities. One assistant veterinary surgeon is manning the unit and is providing basic treatment to all the injured animals brought to the unit. Two helpers are also assisting him in dealing with injured animals.

A new hospital building construction is under progress is expected to be equipped with all the latest facilities and equipments required for the treatment of wild animals.

Enclosures for rescued animals : There are number of different enclosures constructed for the different categories of wild animals like herbivores, carnivores, birds, aquatic animals etc but these

enclosures are not as per Central Zoo Authority guidelines. Therefore, these enclosures require extensive remodeling, extention and upgradation keeping in view the type and habits of the animals to be kept.

Rescue vans and ambulance : To rescue the injured animal and wild animals that are in conflict at the earliest and providing it appropriate treatment, there are two rescue vans functional in the Rescue centre which are being used 24x7.There is requirement for one ambulance fitted with basic facilities for the immediate treatment of the animal at the site of conflict or enroute.

8.4 Visitors in Manda Rescue Centre:

Rescue center at Manda has tremendous tourism potential. The rescue center has number of mammals' species like Cheetal/Spotted Deer, Sambar, Barking deer, Goral, Leopard, Bear, Nilgai and many bird species like peafowl, eagles, owls etc. Average number of visitors is around 1.5 lakh per year. One Nature Interpretation Centre has been constructed for conducting awareness programs regarding Wildlife conservation which is proposed to be upgraded with basic facilities and ICT equipment's. Improvement/enrichment activities should be taken up in the Rescue Centre to increase the public attraction.

8.5 Proposed plans for the upgradation of Manda Rescue Centre:

8.5.1 Construction of new animal specific enclosures : Animal enclosures are required to be species specific and as per the CZA guidelines. The location, material used and type of structure are to be species specific, as there are different habits of different animals like some are nocturnal in habit and some diurnal, some are arborial and some are crepuscular etc. Enclosures available inside this rescue centre are only for few animals therefore, there is urgent requirement for construction of new enclosures for leopards, black bear, small animals like wild cats, foxes, wild boars, porcupines, pangolins, hog deer, goral, different reptiles etc. Moreover, there is also requirement for separate enclosures for injured herbivore animals, monkeys and birds like Eagles, Vultures, kites etc. Since most of the injured animals brought to this rescue centre are Leopards, Black bear, Monkeys, Nilgai, Hog, deer, Goral, Civet cat, Snakes, Eagles, Kites etc, therefore there should be sufficient enclosures for these animals so that injured animals could be properly accomodated. Also the properly treated and fit animals should be timely released in the wild to maintain minimum space in the Rescue Centre.

8.5.2 Upgradation and remodeling of existing animal enclosures : The existing enclosures of the rescue centre are not constructed as per the guidelines of Central Zoo Authority. Therefore, there is requirement for the remodeling, redesigning and extension of these enclosures as per CZA guidelines. It is therefore, proposed that all these enclosures are to be remodeled, redesigned and extended as per CZA guidelines in a phased manner during the plan period.

8.5.3 Upgradation of infrastructure of Veterniary unit : Veterinary unit of Manda has a very minimum facility for the treatment of rescued animals. The lab of the unit is required to be upgraded with latest equipments like X-ray machine, ECG machine, blood analyser, deep freezer, incinators etc. Operation theatre is also required to be upgraded with latest equipments and infrastructure.

The construction work of new hospital building is also required to be speeded up and it is proposed

that this new hospital should be equipped with all the latest equipment which are suitable to all type of wild animals.

8.5.4 Deployment of sufficient man power in the veterinary unit as well as in the Rescue Centre : As the Rescue Centre Manda is the only Rescue Centre where veterinary unit and veterinary doctor is available in whole Jammu region, therefore it is over burdened. All the injured wild animals from all over the Jammu region are being shifted to this Rescue Centre for treatment. Since, only one veterinary doctor is posted in this unit who is being assisted by only one lab boy, therefore, keeping in view the work load and to deal with emergency situations round the clock, sufficient veterniary doctors and veterinary assistants are required to be placed in the unit as well as in the new hospital to deal with wild animals brought to this unit from all over the Jammu region.

8.5.5 Provisioning for Rescue vehicle and ambulance : For rescue of the injured animals from the field/forest and its safe transport upto the Veterinary unit Manda or shifting of critical cases for advance treatment to Govt Veterinary college/hospital R.S.Pura, two Rescue vehicles are available with control room/Rescue centre Jammu which are being used in dealing with rescue operations in four districts i.e, Jammu, Udhampur, Reasi and Samba in addition to the Ramnagar Wildlife Sanctuary. Therefore, there is requirement for strengthening of other control rooms with sufficient rescue vans so that available rescue vehicles are to be used exclusively in the areas falling within the Jurisdiction of Control room Manda only. Moreover, it is proposed that one ambulance fitted with basic facilities required for providing instant treatment to the animals on the spot or enroute is required to be procured for this rescue centre which should exclusively be used for this rescue centre and veterinary unit.

8.5.6 Strengthening and Capacity building of staff of Rescue centre : Only minimum field staff is deployed at Rescue centre Manda who are dealing with taking care of all the rescued animals, providing them with proper feed and fodder, cleaning the enclosures of the animals as well as enriching the enclosures with different facilities so that animals could be relieved from trauma of captivity.

Deployment should be increased so that proper care could be provided to the rescued animals in the Rescue Centre. Moreover, animal keepers and other staff deployed at Rescue Centre are also required to be provided with sufficient safety gears to deal with wild animals with safety.

There should be regular training/capacity building programs for these animal keepers as well as other staff of rescue centre so that they could deal with animals properly keeping in view the habits of the animals.

They should be trained to know about the:

i) Habits and habitats of the different animals
ii) Feeding patterns of the animals
iii) Scat collection for study
iv) Dealing with visitors
v) Danger signs of the animals etc.

8.5.7 Regular renewal of registration of Rescue centre with Central Zoo Authority : Rescue centre Manda is registered with Central Zoo Authority. This registration is required to regularly renewed by keeping sufficient financial provision under admissible scheme.

CHAPTER - 9
ECO-TOURISM, INTERPRETATION AND CONSERVATION EDUCATION

9.1 Introduction:

Tourism is a popular option to support economic development in areas rich in natural heritage. It provides great opportunities of livelihood diversification to the local communities, while opening options to reduce their direct economic dependence on natural resources. But very often, the practices related to tourism are exploitative and abusive towards the fragile ecology of the area, leading to adverse impacts. Promoting sustainable tourism activities in wildlife areas helps in the conservation of critical wildlife areas and is in fact often one of the rationales for the protection of natural areas. There is need to follow values of sustainable tourism by making optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity. For development of an ideal model, it is essential to develop specific roles of the Govt. departments, local communities, external stakeholders (who bring tourists) and the duties of tourists, that shall be guided by effective policies and guidelines. Tourism should conserve cultural heritage & traditional values, and contribute to inter-cultural understanding and tolerance. The tourism should ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

The UT of Jammu and Kashmir enjoys the privilege of being the most preferred destination both by local as well as by international tourists. People are visiting the UT for enjoying the nature, its forests, adventure sports and for religious perspective as well. Jammu being reknowned as the City of Temples, a number of tourists visiting J&K do visit Jammu city and its surrounding tourist destinations. Since, the Sanctuary is located adjacent to Jammu city and on the way to the Mata Vaishno Devi Shrine at Katra, therefore, eco-tourism can be taken-up on a regulated manner in the sanctuary for the awareness of the tourist and also a source of revenue generation and will also add in employment generation to the locals.

The Sanctuary harbours common leopard, nelgai, barking deer, wild boar, rhesus macaque etc. the Sanctuary is also home to birds like red jungle fowl, pea fowl, golden oriole, white checked bulbul, blue rock pigeon, Indian myna and many other bird species. Butterflies like the great orange pit, crimson pit, common jezebel, pansies etc can also be seen.

The Ramnagar sanctuary attracts number of tourists due to the presence of Mini Deer Park in the Sanctuary. A full-fledged zoo is going to be established just adjacent to the Sanctuary in Nagrota area. This way the Sanctuary has great potential for development as eco tourist spot in Jammu city. The existing Deer Park can be improved both in terms of better enclosures for the animals and also infrastructure for handling tourists. The tourists visiting Jammu, particularly those proceeding to Vaishno Devi Shrine can be attracted to the Sanctuary by creating facilities like natural trail for bird watching, horse/camel safari, and trekking etc. These facilities will result in generating revenue as well

as spread awareness on conservation issues.

Regulated eco-tourism in the form of nature education and interpretation tours is the main objective of visitor use and management programs.

A symbiotic and complex relationship between the environment and tourist activities is possible when this philosophy can be translated into appropriate policy, careful planning and tactful practicum. Eco-tourism will act as force of attraction that will lure people to travel to these places to explore its rich natural and cultural resources.

Ecotourism will help in community development by providing the alternate source of livelihood to local community which is more sustainable. Its aim is to conserve resources, especially biological diversity, and maintain sustainable use of resources, which will change the perspective of the visitors about the ecology, environmental conservation and how these factors help in gaining economic benefits.

In simple words, the meaning of ecotourism is responsible travel to natural/wilderness that makes a positive impact on both the ecology and economy of a given destination.

9.2 Principles of Eco -Tourism:

1. Allow for sharing of economic benefits with local community.
2. Respect local cultures.
3. Works towards the conservation of biodiversity,
4. Emphasizes nature-based activities.
5. Stresses the importance of responsible tourism.
6. Realize on an eco-infrastructure that has been developed in harmony with the environment.
7. Ecotourism is essentially about bringing nature/wildlife conservationists, local communities, and responsible travel industry together to ensure development focused on long-term sustainability rather than short-term profits.

9.3 Objectives:

The following are the broad objectives of the Eco-tourism policy:

i) Adopting low impact nature tourism which ensures ecological integrity.
ii) Promoting biodiversity richness and heritage values of India's wilderness.
iii) Engaging local communities and developing mechanisms with a view of enriching the local economy and promoting sustainable use of indigenous materials.
iv) Establishing partnerships with all stakeholders for developing and promoting nature tourism.

9.4 Strategies for Regulated Tourism:

Issues related to regulation of tourism activities in the Sanctuary are:-

1. Lucid tourism zone which is not properly demarcated
2. Inadequate eco-tourism planning
3. Inadequacies in waste management
4. Insufficient infrastructure and trained manpower

Following activities are proposed for effective visitor management and improving visitor satisfaction:-

1. Fixing carrying capacity.
2. Maintenance of trekking routes.
3. Development of nature friendly structures for visitors.
4. Taking up day nature tourism in the sanctuary.
5. Training of locals as guides.
6. Strengthening of Nature Interpretation Centre.

Upgradation of NIC by way of creating different Sections which are given below:-

1. **Floral Diversity of the Jammu Province:** It includes all the wild as well as cultivated plants of the region.
2. **Faunal Diversity of the Jammu Province:** It includes five sub-sections of insects, reptiles, birds, fishes, amphibians and mammals and the threatened flora and fauna.
3. **Protected Area Network of the Jammu Province:** The list of the Protected Areas including the National Parks, Wildlife Sanctuaries, Wetland Reserves, Conservation Reserves etc. including the other proposed areas along with the maps.
4. **Cultural and Traditional Heritage of the Province:** Historically important, culture and dresses, languages, dances and tourist spots etc.
5. **Trade in Wildlife Products:** Illegal selling of the live birds, trade of animal (insects, musk and shatosh) and wild plant produce (medicinal plants, NTFPs).
6. **Human-Biodiversity Relationship:** Agroforestry systems, Social forestry, Sacred grooves, Water shed management etc.
7. **Central Library** to be established with in the NIC, which includes books as well as soft/electronic copies i.e. CD's on fauna, flora, biodiversity issues, man-animal conflicts, research papers, forest, environment and wildlife acts and rules etc. The central library should also have computer section fully equipped with latest technologies related to wildlife and broadband connection.
8. **Cartoon section:** The cartoon of wildlife depicting major wildlife, their conservation requirement etc, as cartoons attracts the children most and they are informative and catchy also.

CHAPTER - 10
ECO-DEVELOPMENT

There are number of villages in the vicinity of the sanctuary and have resource-based dependencies on the sanctuary, but these dependencies cause lot of adverse impact on conservation of the sanctuary and its adjoining areas from wildlife point of view.

Involvement of people in management of forests and natural resources is envisaged in the National Forest Policy, 1988. Since early 1990s, many protected areas in the country started addressing the issues related to people's dependency on forests and their livelihood security. The Ramnagar Wildlife Sanctuary spreads over 31.50 sq kms area (As per notification) and is surrounded by number of villages and city establishments resulting in heavy biotic pressure.

10.1 Objectives:

Objective of eco-development inputs proposed in this plan is to improve livelihood opportunities and reduce negative impact of people on Sanctuary and vice versa.

1. To align the developmental system in and around Sanctuary in accordance with local conservation needs.
2. To generate additional sources and opportunities of livelihood for the people living in and around the villages near sanctuary.
3. To reduce the conflict, if any, between the wildlife and the humans living around sanctuary.
4. To develop a Participatory Conservation Model to ensure people's engagement in conservation and natural resource management.
5. To develop a Nature Education Model for local communities, that will bring traditional and scientific knowledge together for effective management & preservation of resources.
6. To develop an effective Nature Interpretation Model for educating the visitors about the ecosystem highlights and conservation challenges, for keeping them informed and guiding them towards responsible activities.

10.2 Specific issues:

The major issues which are affecting the fringe area people, wildlife and vice versa are the following: -

- Pressures for resources use such as fire wood collection, grazing, unscientific collection of NTFP, unauthorized trekking within the sanctuary etc.
- Inadequate documentation of traditional knowledge.
- Non identification of zone of influence.
- Human-animal conflicts.
- Non settlement of forest rights.
- Inadequate environmental awareness.

10.3 Broad Strategies for involving people in conservation:

It is important to convey to the people about the importance of resources and ecosystem dynamics in creating a liveable environment, and make them realize how the protected area status of Ramnagar sanctuary safeguards this pool of resources, and logically persuade them to build up a commitment for conservation.

The following steps will be taken for implementing this strategy:

- Constitution of EDCs in the surrounding villages through fortnightly or monthly meetings & discussions, and involving them in conservation activities. There has to be presence & participation of wildlife officials in these conservation groups for guidance and moderation.
- Discussing conservation challenges and problems faced by local community due to wildlife. This will make the communities feel connected with the sanctuary and will also improve their relationship with the Wildlife Department.
- Raising awareness level and imparting training to EDCs/PRIs regarding the following:
  - Conservation Education: Knowledge on ecosystem services provided by surrounding environment.
  - Role of wildlife species found in the surroundings, and their importance in maintaining the health of ecosystem and livelable environment.
  - Laws, rules and legal provisions with regard to environment in Jammu and Kashmir.
  - Government schemes meant for development and upliftment of rural communities.
  - Basic skill development trainings for locals so that they could serve as a resource for sanctuary management operations when needed.
- Consultation to address specific issues and preparation of microplans.
- Revisiting of microplans following the guidelines for participatory management.
- Providing alternate livelihood support to reduce dependency on Sanctuary.
- Measures to reduce negative impact of Sanctuary on people.
- Training to the staff and EDC/PRI members in various aspects of implementation of eco development activities.

10.4 Measures to mitigate Human-Wildlife Conflict:

Department is already taking up possible mitigation measures, such as construction of chain-link fencing, engaging local labour for man-animal conflict resolution, additional staff deployment, improving communication facilities, formation of local people committees etc. for scaring away the wild animals from cultivation areas. Public participation in dealing with the causes behind such conflicts should be enhanced by way of regular meetings, awareness generation etc.

10.5 Measures to reduce negative dependencies on the Forests:

Major negative dependencies of people in the surrounding settlements include cattle grazing, firewood collection, morning and evening unregulated walking and unscientific collection of NTFP. To address these issues, following measures are suggested.

- **Regulated Cattle Grazing:** Gradual process for shifting of nomadic graziers from the sanctuary

area is to be initiated. Till time regulated grazing to be permitted on pre-selected patches only.

- **Regulated movement only should be allowed:** Alternate tracks should be developed either outside the sanctuary or at the fringes so that there should be minimum disturbances to the wild animals.
- **Firewood collection:** Firewood is collected for self use by nomads and local people in the buffer. Though this is not a major problem at present, measures needed to be taken to contain the issue to an optimum level by specifying areas for collection and quantity that can be removed. Following options are proposed to address the problem.
- **Fuel wood reserve** may be proposed in the settlements or peripheral area of settlement. People may be encouraged to plant fuel wood species in the space available within their settlements and also to adopt fuel efficient devices.
- **Solar and Bio gas plants** should be supported.

CHAPTER - 11
RESEARCH, MONITORING AND TRAINING

Well organized research on biological and socio-economic aspects helps in arriving at appropriate management decisions. Several long term and short term studies are to be carried out in the Sanctuary. It is proposed to invite national and state level research organizations and NGOs for a brainstorming session in order to prioritize research and monitoring activities in sanctuary. The frontline staff of sanctuary could be attached with the research projects so that they can get basic training in various techniques, particularly in monitoring changes in animal and plant populations, habitats etc.

The long-term aim of the plan is to achieve an understanding of the whole ecosystem and biology so that it becomes possible to predict confidently and accurately the response of natural systems to management practices. It is also essential that required research/studies are to be carried out by Department with the help of specialist institutions, local people and knowledge base generated so far. Survey and inventories which are required to gain knowledge and know how techniques should also be part of research. Research, monitoring and training are among the weakest area in wildlife management. The need is acknowledged but there is very little progress. Research has suffered due to lack of policy, unclear objectives, priorities, inadequate funding support etc.

11.1 Research:

Major gaps identified in information include inadequate documentation of small mammals, reptiles, amphibians, fishes and invertebrates, weeds etc, gaps in information on flora and fauna and inadequate dissemination of available information. An institutional mechanism for conduct of research, collation and dissemination of information is required. Laison with academic and research institutions and involvement of staff will also improve the database required for management. Research can play an important role in the protection of sites and their biodiversity, but not all research carried out in protected areas serves this role. Research in protected areas can be divided into two groups according to its goals. The first group comprises research that is carried out to support management and to solve problems in the conservation of protected areas. The second group covers research that simply aims at a better understanding of natural and human-mediated processes, without necessarily having any applied conservation goals. Research with general conservation goals that are not directly related to the conservation, monitoring, or management issues of the protected areas also fall within this latter category.

Research in protected areas should always be accompanied by appropriate research plans that clearly outline goals, methods, field and laboratory activities, involved staff, and the duration of the study. Access to research results and field data provided to the area authority should be unconditional as soon as they are published. For data which form part of long-term ecological research (LTER) or which are not conclusive enough to allow publication, access should be agreed even before or without publication. If not published in one of the major world languages, translation of the most outstanding

results is obligatory for any such researches.

The major research activities to be taken up in the Sanctuary are as follows: -

1. Species distribution, population trends, age sex ratio, densities and habitat requirements of different species of flora and fauna i.e. mammals, birds, reptiles, butterflies.
2. Botanical survey for grasses, herbs, epiphytes and faunal survey of small wildlife vertebrates and invertebrates.
3. Study & monitoring number, extent and impact of grazing.
4. Conduct studies to document flora and fauna of the Protected Area including RET and endemics.
5. Study and document traditional knowledge of indigenous communities.
6. Study and identify invasive species that have negative impact on eco-tourism.
7. Study the extent of the wildlife damage problems including the wildlife and crops involved.
8. Conduct studies on small mammals, rodents, bats, insectivores and lesser carnivores, reptiles, amphibians and invertebrates.
9. Introduce short term management-oriented research – impact of fire, impact of weeds, man-animal conflict etc.
10. Develop long term monitoring plots in different types of habitats to study the changes in phenology, animal behavior and species shift with respect to climate change and vegetation dynamics.
11. Review of practices for removal of weeds.
12. Study the status of weeds and provide suggestions for phased removal.
13. Continuous monitoring of weed infested areas and areas where weeding has done.
14. Evaluation and monitoring of fire and its impact.

11.2 Monitoring:

Regular monitoring of habitat, biodiversity, wild animal population, impact of climate change, impact of habitat fragmentation etc. should be done by the research unit. The findings of the monitoring programmes could be used in management decisions of the Sanctuary. Initial data collection should be done by the staff of the Division who will be properly trained by the research unit for the purpose. Soil formation processes in forest ecosystems and indicators of soil quality to be analyzed. Biodiversity database for major forest types should be developed and the uses of this biodiversity to be examined. The effect of changes in ecosystem structure and functioning in response to global biophysical and sociological impacts on the delivery of ecosystem services, both tangible and non-tangible, should be documented.

Overall, there are at least three reasons why monitoring is important: -

i) **Monitoring allows us to assess the status of threats and conservation targets:** In particular, we need to understand whether threats are decreasing or increasing and whether wildlife populations are increasing, remaining stable or declining. Managers need to know the system state before deciding on the appropriate course of action during the ensuing project management cycle.

ii) **Evaluating the effectiveness of management interventions:** Monitoring helps us identify which actions lead to the success or failure of a particular conservation approach and evaluate and revise

assumptions as to why and where conservation efforts are needed.

iii) **Informing and improving management practice through an adaptive management process:** Monitoring helps in learning from the experience of implementing the chosen management interventions and to modify management interventions accordingly. Thus, monitoring plays a key role in the process known as adaptive management- which is a dynamic process that involves the integration of monitoring results back into project design and implementation.

The following monitoring strategies may be taken up during the plan period: -

1. Population monitoring of herbivores.
2. Status, trend, densities, patterns, behavior of migratory birds.
3. Annual estimation of major mammals
4. Surveys of Birds, reptiles, amphibians, and invertebrates periodically.
5. Monitoring of problematic animals.
6. Monitoring the seasonal water availability in natural streams, check dams and waterholes and generate maps.
7. Review and implementation wildlife health monitoring protocol.
8. Regular wildlife health monitoring.
9. Establishment of a logbook to record observation of all Antipoaching camps, in and around Sanctuary.
10. Monitor and document the impact of human activities on natural habitats, including the spread of disease, impact of fires started to facilitate grazing and NTFP collections.
11. Monitoring annual fires, impact of fire on habitats and generation of control maps.
12. Monitoring mortality of wild animals and its documentation.
13. Monitoring regeneration status and soil erosion study.
14. Population monitoring of selected species of flora and fauna.
15. Monitoring of intrusion and regeneration of invasive species.
16. Monitoring the regeneration of natural species in the restoration zone.
17. Monitoring impact of eco-ecotourism programmes.
18. The monitoring activities of vulture species should be taken up and all the roosting and/or nesting sites should be observed for their continued use.
19. Monitoring of dead carcass of vultures and due examination of it.

11.3 Training:

Various training programmes for skill development should be regularly organized frequently for the staff of all categories. The frontline staff needs to be trained in measuring and preserving animal specimens, tracks signs, interviewing surveys and wildlife surveys. They should be well versed with use of topographical sheets, basic field equipments. They should be able to look for indirect evidences of animals in the field. Identification of bird species, trees, shrubs are also important for the management of wildlife, hence training in these aspects is also important.

Following topics are proposed for training to improve the capacity of staff and EDC/PRI members.

1. Understanding of relevant sections and rules made there under laws in Forest Act, Wildlife Protection Act, IPC, CrPC, Arms Act, NDPS Act, Environmental Protection Act, Guidelines, Policies and recommendations of subjects related environment and Forests etc.
2. Training on case framing, investigation of crimes and pleading in the courts.
3. Training on identification of wildlife parts and products.
4. Understanding of principles and procedures of intelligence gathering.
5. Instructions for safe keeping of seized materials/parts.
6. Knowledge of various types of arms, ammunition and their use and maintenance.
7. Knowledge of fire management, assessing loss due to fire, preparation of fire plan.
8. Knowledge of predator specific signs of killings, monitoring of cattle lifting cases, disposal of carcass etc.
9. Knowledge of procedures to deal with human injuries and death caused by wild animals.
10. Knowledge on significance of soil conservation treatments.
11. Significance of habitat monitoring including protocols and periodicity.
12. Understanding population estimation methodologies, use of compass, range finders, night vision equipments, GPS and camera traps.
13. Daily monitoring protocol and its implementation.
14. Knowledge of zoonotic diseases, prevention of infectious diseases.
15. Knowledge of collection, preservation and transport of samples.
16. Knowledge in handling of sick and injured animals.
17. Scientific collection, storage and value addition of NTFP.
18. Training to staff and guides in visitor management, conduct of ecotourism programmes etc and enhance skill in identification of birds, butterflies, tree species and medicinal plants.
19. Knowledge of first aid, stress management and personality development.

Further, it is proposed that a periodic research-oriented survey/population estimation at least once in every 05 years should be conducted to access the biodiversity and status of wildlife in the sanctuary.

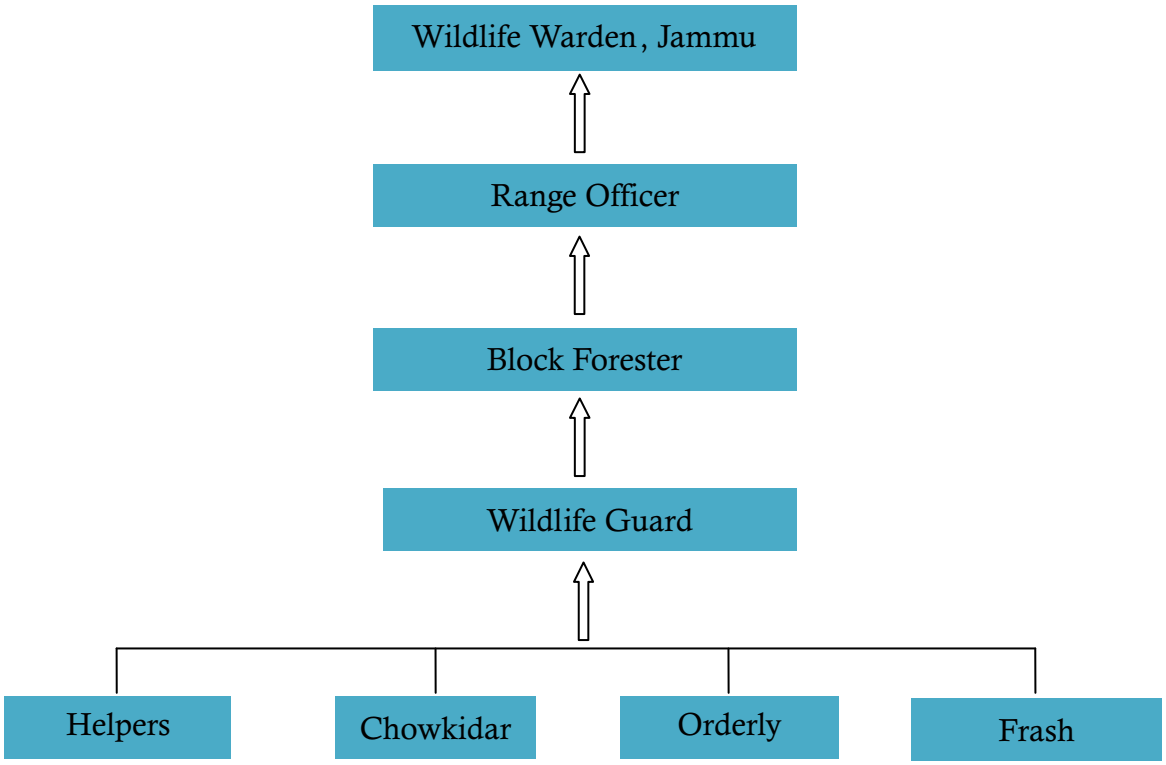
CHAPTER - 12
ORGANISATION AND ADMINISTRATION

12.1 Objectives:

Main objective of administration is to ensure that appropriate technical and administrative staff required to manage the Sanctuary effectively is approved and got posted.

12.2 Administrative Setup and Staff pattern:

The sanctuary falls under the jurisdiction of Wildlife Warden Jammu, with administrative structure depicted in the figure as below.



The present Sanctioned staff strength of Wildlife Division, Jammu is as follows:

Annexure "A10" to order No. 92 of 2020 Dated: 10.08.2020.

S.No.	Category of Post	Pay Level	Sanctioned Strength	Working Strength
Gazetted				
1	Wildlife Warden	Level 8	1	1
2	Range Officer Gr-I	Level 6E	1	0
Total Gazetted			**2**	**1**
Non- Gazetted				

1	Range Officer Gr-II	Level 6	1	02
2	Wildlife Forester	Level 5	4	05
3	Senior Assistance	Level 5	1	01
4	Junior Assistance	Level 4	2	02
5	Deputy Foresters	Level 3B	2	0
6	Wildlife Guards/ Anti poaching Guard	Level 2	43	21
7	Watcher	Level 2	1	01
8	Orderly	SL1	3	05
9	Chowkidar	SL1	02	02
10	Helper	SL1	36	33
11	Mali	SL1	01	01
12	Fieldman	SL1	01	01
13	Khalsi	SL1	02	01
Total Non- Gazetted			**99**	**75**
Total Strength			**101**	**76**

Working strength of Ramnagar Wildlife sanctuary is as under:

S.No.	Category of post	Working strength	Extra required
1	Veterniary Doctor	1	1
2	Range Officer	2	0
3	Wildlife Forester	5	1
4	Junior Assistant	0	2
5	Wildlife Guards	2	10
6	Helper	5	10
7	Chowkidar	2	2
8	Orderly	1	3
9	Lab boy	1	3
10	Driver	1	2

12.3 Existing Infrastructure:

S.No.	Building Name	Geo-refrences
1	Range Office, Manda Jammu	N32 45 01.42 E 74 52 08.01
2	BO Hut Sitlian	N32 45 01.42 E 74 52 08.01

3	Guard Hut Dountaly	N32 45 01.42 E 74 52 08.01
4	Guard Hut Janipur	N32 45 01.42 E 74 52 08.01
5	Guard Hut Sitlian	N32 45 01.42 E 74 52 08.01
6	Guard Hut Khanpur	N32 45 01.42 E 74 52 08.01
7	Inspection Hut Manda Jammu.	N32 45 01.42 E 74 52 08.01
8	NIC Manda Jammu	N32 45 01.42 E 74 52 08.01
9	Veterinary unit	N32 45 01.42 E 74 52 08.01
10	Manda Control Room	N32 45 01.42 E 74 52 08.01
11	Rescue Centre, Manda	N32 45 01.42 E74 52 08.01

12.4 Staff Amenities and Field Equipment

Present availability of amenities and equipment are not sufficient for the field staff to carry out day to day activities related to the job. Therefore, in order to efficiently implement the Wildlife Laws and plans, following are required:

a) Personnel: Sufficient number of frontline staff is need to be posted for all the conservation and monitoring process. Currently, the Sanctuary is grossly under-staffed especially at guard level and this has left the current staff under huge pressure of manning a protected area being located adjacent to Jammu city. For the ease of management, sufficient number of field personal should be recruited/placed (as laid out in the Table 11.1 above). Moreover, assistance from Forest Protection Force can also be sought to fill the gap of staff shortage till the regular appointments are being made.

b) Training: All staff needs to be adequately trained in appropriate data collection methods and analytical procedures. It has to be ensured that appropriate trainers are identified and that training Programs/ workshops are planned accordingly. Trainings or capacity buildings are critical for maintaing/upgrading management capabilities of wildlife staff. Wildlife training at all levels should be encouraged. Trainings in following forms should be taken.

- ⇨ Organizing subject specific training by the experts
- ⇨ Sending staff in training courses organized by different institutes. Exposure visits /study tours.
- ⇨ Orientation/Refresher courses

c) Equipment: The following equipments are proposed to be purchased for the purpose of implementation of management plan as well as for successful management of the Sanctuary along with training of staff to use these equipments:

- ⇨ Binoculars including night vision binoculars (preferred for wildlife observations)
- ⇨ Sighting compass with declination adjustment
- ⇨ DSLR Cameras
- ⇨ GPS
- ⇨ Drones
- ⇨ Camera traps, thermal recorders, voice recorders and other latest equipments.

- ⇨ Latest equipments for rescue centre and veterinary centre.
- ⇨ Safety kits for staff dealing with rescue operations and dealing with rescued animals.
- ⇨ Providing mobiles/walky talky to the staff for better communication.
- ❖ **Logistics:** The monitoring field teams need to move around the landscape. They require sufficient vehicles together with an estimate of fuel costs and other logistical support like camping material, uniform etc.

12.5 Detail of new infrastructure proposed:

Guard huts are required to be constructed at Kamala, upper Roopnagar/SFRI Janipur and Chinore fitted with basic facilities. In addition one block hut is also proposed at Chinore area. Also two watch towers are proposed in compartment number 2/P and 3/P at the top locations so that staff could keep an eye on the sanctuary.

12.6 Duties and Responsibilities:

12.6.1 Wildlife Warden Jammu : The Sanctuary is managed by Wildlife Warden who works under the guidance of Regional Wildlife Warden, Jammu. Main responsibilities of Wildlife Warden are as under. He shall:

- ⇨ Supervise and coordinate all the matters related to wildlife protection and management in all protected areas under his jurisdiction, ecologically critical areas, critical watersheds, wetlands of critical ecological importance, and environmental management under Wildlife Preservation Act and other Ordinances, Rules and Regulations and Directives issued by the government from time to time;
- ⇨ be responsible for overall administration of the sanctuary.
- ⇨ be responsible to take necessary measures and efforts to fulfill national obligations towards wildlife, biodiversity and other forestry and environmental related international treaties, protocols and conventions endorsed by the government;
- ⇨ be responsible for completion of all works within the budget provision of the division and distribution of funds within his budget grant among the ranges under him;
- ⇨ be responsible for all correspondences relating to wildlife management from time to time;
- ⇨ be responsible for taking programme related to conservation and management of PAs. Supervision of environmental management and nature conservation functions outside the Pas;
- ⇨ be responsible for drawing up programme for monitoring, survey and research in the PAs in relation to wildlife and biological diversity;
- ⇨ be responsible for preparation of budget and revised budget of his division.
- ⇨ be responsible for providing proper executive and operational guidelines to the field staff of the Wildlife.
- ⇨ be responsible for preparation of annual programme related to conservation of biodiversity and eco-tourism;
- ⇨ be responsible for preparation and annual inspection of subordinate offices within his jurisdiction;

- ⇨ be responsible for proper execution of all development programmes within his circle;
- ⇨ be responsible for auditing of divisional accounts.
- ⇨ technical sanctions within his powers etc.

12.6.2 Range Officer Wildlife Range Jammu : The Range Officer Wildlife Range Jammu as officer in-charge for Ramnagar Wildlife Sanctuary will directly report to the Wildlife Warden.

The following are responsibilities for Range Officer. He/she will:-

- ⇨ be responsible for overall administration of the Range within his jurisdiction;
- ⇨ be responsible for exercise of powers given under various Acts and Rules there under;
- ⇨ Assist Wildlife Warden in conducting smooth administration of the Division in which they are posted;
- ⇨ Assist Wildlife Warden in the matter of maintenance of discipline of the Division;
- ⇨ be responsible for plantation and other works for habitat improvement within his jurisdiction;
- ⇨ be responsible for execution of development programme related to protected area management and wildlife conservation within his jurisdiction;
- ⇨ be responsible for the matter of checking theft and pilferage of forest produces and wildlife;
- ⇨ be responsible of checking encroachment of Wildlife areas;
- ⇨ facilitate and catalyze linkages for livelihood programs in the identified landscape zones;
- ⇨ maintain close liaison with Forest Department staff responsible for the management of neighbouring forests and social forestry plantations; and any other duties assigned by the WLW.

CHAPTER - 13
THE BUDGET

13.1 Plan Budget:

The main financial allotment to this Division under various budget heads is detailed below.

Ramnagar Wildlife Sanctuary Budget expenditure details.
(Rs. in Lacs)

Plan Heads	2015-16	2016-17	2017-18	2018-19	2019-20
Campa	13.98	25.72	100.48	136.33	92.74
CSS	17.5	7.98	-	26.82	-
Capex	4.82	4.93	9.19	2.47	1.67
Grand Total	**36.3**	**38.63**	**109.67**	**165.62**	**94.41**

Proposed physical targets for ten years 2020-21 to 2029-30

S.No.	Major Components of Intervention	Phy.
A	**Habitat Management**	
	Plantation of fruit / fodder plants/ ornamental plants	50,000 Nos.
	Fencing of the open boundaries & the sites of the plantation (BA/ Chain-link)	25000 rft
	Creation of new Water holes / ponds	70 Nos.
	Repair and desilting of ponds.	As per requirement
	Removal of unwanted weeds.	500 ha
	Fire protection (Construction and maintenance of fire lines)	40 km
	Const. of Inspection path/trecks and Maintenance	40 km
	Soil and water Conservation measures by way of DRSM/Gully plugging/ Crate works/ Check dams etc.	25000 cum
	Patch sowing of grass slips/ soil binder species.	250000 Nos.
B	**Management of Man-Animal Conflict & Rescue operations**	
	Management of Man-Animal Conflict & Rescue operations	As per requirement
	Purchase of equipments/ training/ communication devices	As per field requirement
	Drugs / Medicine and medical equipments and purchase of an ambulance	As per requirement
	Misc. Activities	As per actual requirement.
C	**Survey & demarcation**	Complete demarcation
D	**Development/ improvement of infrastructure**	As per Management plan
E	**Awareness / publicity**	As per requirement
F	**Eco-tourism**	As per requirement
G	**Compensation for damages**	As per requirement
H	**Improvement of veterinary facilities**	As per requirement
I	**Procurement of patrolling vehicles/ rescue vans for field staff**	As per Management plan
J	**Survey and documentation of biological diversity of the area.**	As per requirement
	G. Total	

Proposed Budget of Ramnagar Wildlife Sanctuary for 10 years (2020-21 to 2029-30)

S.No.	Para of Management Plan	Activity	Financial requirement (Rs. nnLakhs)										
			1st Year (2020-21)	2nd Year (2021-22)	3rd Year (2022-23)	4th Year (2023-24)	5th Year (2024-25)	6th Year (2025-26)	7th Year (2026-27)	8th Year (2027-28)	9th Year (2028-29)	10th Year (2029-30)	Total
A.	**Improvement of Wildlife Habitat**												
1.		Plantation including fruits/fodder species.	3.00	0	0	2.00	2.00	2.00	2.50	2.50	2.00	2.00	**18**
2.		BUC in old closures/patches	1.35	0.76	0.50	0.50	1.00	1.00	1.20	1.50	1.50	1.50	**10.81**
3.		Lantana/weeds/bushes clearance for growing of grasses and free movement of wild animals/ restoration of the areas by patch sowing, grass slips, broadcasting of seeds etc.	3.75	3.11	10.00	10.00	10.00	10.00	10.00	10.00	15.00	15.00	**96.86**
4.		Grass Slips.	3.80	1.50	3.00	3.00	3.50	3.50	4.00	4.00	4.50	4.50	**35.3**
5.		Patch Showing.	3.00	0	1.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	**14.5**
6.		Construction/ Maintenance of water holes.	2.50	8.50	8.00	10.00	10.00	10.00	10.00	6.00	6.00	8.00	**79**
7.		Providing of water supply to water holes during dry season by water tankers etc.	0	0	1.00	1.00	3.00	3.00	3.50	3.50	4.00	4.00	**23**
8.		Construction/ Maintenance of Ponds.	1.69	0	10.00	10.00	15.00	10.00	5.00	5.00	7.00	7.00	**70.69**

B.	**Protection of plantation, PAs and demarcation of PAs**											
9.		Repair and renovation of existing Chainlink fencing/boundary wall/ barded wire fencing at Ramnagar Wildlife Sanctuary.	2.30	17.67	10.00	5.00	5.00	6.00	6.00	7.00	7.00	8.00	**73.97**
10.		Fencing (Chainlink/ Barded wire/ Mesh wire) at Ramnagar Wildlife Sanctuary adjoining fringe villages/city.	0.99	5.20	10.00	30.00	30.00	20.00	5.00	5.00	7.00	0	**113.19**
11.		Construction of Watch Towers & maintenance of existing.	0.00	0	0.00	30.00	30.00	10.00	0.00	5.00	0.00	2.00	**77**
12.		Consolidation of Boudaries by way of fixation of Boundary pillars (BP's) & repair etc.	0.00	2.00	3.00	5.00	5.00	0.00	0.00	2.00	0.00	1.00	**18**
13.		Removal of existing fencing from the inside of the sanctuary which is of no relevance now.	0.00	0.00	0.00	5.00	5.00	10.00	10.00	10.00	0.00	0.00	**40**
C.	**Soil and Moisture conservation Works/Catchment area treatment**											
14.		DRSM/Gully Plugging in soil erosion prone areas/upper catchments of the nallahs.	4.75	4.51	8.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	**87.26**
15.		Planting of Soil binder species /grass slips etc in sloppy /landslide areas.	3.05	0	3.00	3.00	4.00	4.00	1.00	1.00	1.00	1.00	**21.05**

16.		Laying of Crates in middle portions of the catchments/in the areas which are prone to slides/heavy errosion.	3.50	3.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	**86.5**
17.		Construction & Maintenance of check dams in the lower portions of the catchments.	0.00	1.80	15.00	30.00	30.00	30.00	40.00	10.00	10.00	15.00	**181.8**
18.		Plantation of Soil binding plants species like bamboo etc in lower catchments	0.00	0.00	1.00	2.00	2.5	2.5	1.5	2.0	2.0	2.0	**15.5**
D.	**Forest Fire prevention and control measures**												
19.		Construction of fire line 10 m in width with standard specification	0.00	0.88	1.00	2.00	3.00	3.00	0.00	2.00	0.00	0.00	**11.88**
20.		Maintenance of fire line with standard specification	3.20	2.50	3.00	3.00	3.00	4.00	4.00	4.00	4.00	5.00	**35.7**
21.		Payment for Fire Protection Labour (SoS) for 4 months.	0.80	1.00	1.00	1.00	1.50	1.50	1.50	2.00	2.00	2.50	**14.8**
22.		Contingency/unforeseen expenses including office/ Computer stationery, vehicle, POL/repair and maintenance of equipment's etc.	2.50	3.00	5.00	5.00	5.00	5.00	5.00	6.00	6.00	7.00	**49.5**
E.	**Establishment, operation and maintenance of animal rescue centre, control room and veterinary treatment facilities.**												
23.		Purchase of rescue equipment for handling of man-animal conflicts	2.00	10.00	10.00	10.00	10.00	5.00	5.00	5.00	5.00	0.00	**62**
24.		Purchase of crackers and other animal scaring equipmentsetc used during rescue operations	1.00	1.00	2.00	2.00	2.50	2.50	2.50	3.00	3.00	3.50	**23**

25.		Hiring of private vehicles, maintenance of rescue vehicles for rescue operation and human animal conflict resolution.	0.00	1.00	3.00	4.00	4.50	4.50	4.50	5.00	5.00	5.00	**36.5**
26.		Purchase of Drugs/tranquilizing drugs/ medicines etc. for veterinary hospital and rescue centres	2.00	2.00	5.00	5.00	5.00	7.00	7.00	8.00	8.00	9.00	**58**
27.		Purchase of safety equipments for the fieldstaff and rscue teams.	1.00	1.00	10.00	10.00	2.00	2.00	5.00	5.00	5.00	5.00	**46**
28.		Purchase of supplements/ drugs/stall feeding, Salt licksetc for rescued animals/in PAs animals.	2.00	0	4.00	4.00	5.00	5.00	6.00	6.00	7.00	7.00	**46**
29.		Expenses for running of control rooms.	1.00	0	3.00	3.00	4.00	4.00	5.00	5.00	6.00	6.00	**37**
30.		Purchase/ Maintenance of Rescue vehicles and other vehicles for staff.	2.00	1.50	10.00	10.00	5.00	5.00	5.00	6.00	6.00	6.00	**56.5**
31.		Purchase of latest equipments for monitoring of wildlife in Ramnagar wildlife sanctuary.	2.00	7.00	5.00	5.00	5.00	3.00	3.00	5.00	3.00	5.00	**43**
F.	**Eco-development activities including supply of wood-saving cooking appliances and other forest produce saving devices etc in forest fringe villages in consultation with local communities**												
32.		Purchase of gas stove, solar lightsetc and other solar cooking appliances for distribution among locals, Eco development activities like construction of pond, path, bowli etc. in consultation with local communities.	0	0	5.00	5.00	7.00	7.00	5.00	8.00	8.00	8.00	**53**

G.	**Construction of residential and official buildings for front line staff/ Infrastructure development.**											
33.		Construction/Maintenance of infrastructure for field staff/ frontline staff Maintenance and up gradation of existing infrastructure of Ramnagar wildlife sanctuary.	150.0	53.00	30.00	30.00	30.00	5.00	7.00	3.00	3.00	10.00	**321**
H.	**Construction, up-gradation and maintenance of inspection paths, fire lines, watch towers etc .**											
34.		Const. of inspection paths & maintenance	3.18	1.35	5.00	5.00	5.00	3.00	3.00	3.00	4.00	4.00	**36.53**
I.	**Casual engagement of Labour to supplement the field staff**											
35.		Provision for wages of Need based/ casual Labour/ engaged under CAMPA.	23.20	14.00	15.00	15.00	15.00	16.00	16.00	17.00	17.00	18.00	**166.2**
36.		Payment for local Labours/informers for Anti-poaching Works/ Man-Animal conflict resolution.	0	0	1.00	1.00	1.00	1.50	1.50	2.00	2.00	2.00	**12**
J.	**Publicity cum awareness programmes.**											
37.		Organizing of Awareness Camps/ Printing of awareness material regarding man-animal conflict, flora and fauna etc/ Celebrations of wildlife week, Van-Mahotsav, / Installation of Hoarding and Sign Boards in adjacent to the Protected area along the National Highway/ link roads etc.	2.50	1.00	7.00	7.00	7.00	8.00	8.00	8.00	10.00	10.00	**68.5**

K.	**Documentation of Biological Diversity.**												
38.		Research, montioring and evaulation / Listing, detailing, examination and documentation and printing of biodiversity	3.00	2.00	5.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	**80**
5.	**Grand Total (A to K)**		**235.06**	**150.28**	**220.5**	**300**	**303**	**241.5**	**221.2**	**209**	**199.5**	**215.5**	**2295.54**

Note:The financial estimate / Budget Proposed shall be subject to the Govt. scheduled Rates issued from time to time.

Part - III

Annexures

STATUS SURVEY REPORT OF THE PROPOSED RAMNAGAR WILDLIFE SANCTUARY

Notification : The area has been named after, Ramnagar Ridge of Manda hills of Jammu.

Proclamation : The Wildlife Sanctuary is located on the right of river Tawi and Jammu city is situated south-west of the sanctuary.

Boundaries:

- North : Keranwali Rakh
- East : River Tawi and Khanpur village
- South : Jammu city
- West : Jammu city

The proposed area covers an area of 12.15 sqkms as per GIS calculation.

Approach : The proposed Sanctuary is accessible being adjacent to Jammu city and National Highway NH-44 passes through it. It is 03 kms from General Bus stand Jammu on the North-Eastern side.

Threats : The local habitation surrounding the area and falling in the vicinity indulge in collection of fire wood and take their live stock in the area for grazing, unregulated movement of locals, vehicular movement on the highway.

Legal Status : The area was under the administrative and technical control of forest Department till 1990-91 now being administrated by the Department of Wildlife Protection.

Configuration : The area is hilly and broken by large Khuds running from north to south.

Climate : The climate is sub tropical and experience monsoon as well as winter showers.

Condition : COMPOSITION AND CONDITION OF CROP

The sanctuary has predominant species Acacia modesta, Cassia fistula, Aegle marmelos and also sustains the Bamboo plantations and controlled by a number including explore altitude and above all biotic interferences, Bamboo plantation is associated by other broad leaved species like *Acacia catechu, Acacia arabica, Dalbargia sisoo, Aegle marmelos, Lannea grandis* etc. The shrubs include *Lantana camera, Carrisa sainarum, Moringa* etc and climbers such as *Bauhinia vahlii* etc come into composition.

Once the area was very rich in wide variety of fauna and due to excessive biotic interference like disturbances due to human movement inside the sanctuary, unregulated grazing and fragmentation of the area only few species are left which are stated as under: -

1. Leopard *(Panera pardus)*
2. Barking Deer *(Muntiacus muntjak)*
3. Wild Boar *(Sus scrofa)*
4. Rhesus macaque *(Macaca mulatta)*
5. Jackal *(Canis aureus)*

6. Hare *(Lepus nigricollis)*
7. Porcupine *(Hystrix indica)*
8. Jungle cat *(Felis chaus)*

Avi-Fauna:

The proposed area holds a distinction of harbouring rich and variety of pheasant besides, other migratory and resident birds.

The list of prominent birds is as under:

1. Pea fowl (Pavo cristatus)
2. Red jungle fowl (Gallus gallus)
3. Red Bush Quail (Perdicula asiatica)
4. Green Pigeon (Treron phoenicopera)
5. Blue Rock Pigeon (Columba livia)
6. Laughing Dove (Streptopelia senegalensis)

Recommendations : The Maharaja of the erstwhile state established the area on a Private Rakh under the Game Preservation Act 1942 and named it after the Ramnagar ridge of Manda hills, to ensure the availability of shooting for his favorite pastime. But due to continuous development in the surroundings, habitat loss, biotic interferences and other disturbances in the area, population of wild animals reduces in the sanctuary. In order to protect the area, habitat and wildlife of the area, there should be minimum biotic interferences in the area, Determination of existing rights to be done on priority and final notification for declaring Ramnagar Wildlife Sanctuary as protected area is required to be issued under Wildlife Protection Act 1972.

Annexure - I

GOVERNMENT OF JAMMU AND KASHMIR
CIVIL SECRETARIAT: FOREST DEPARTMENT
(WILDLIFE PROTECTION)

.....

NOTIFICATION

JAMMU, THE 10th APRIL, 1990

SR0-136 : Whereas, it appears to the Government that the area of Ramnagar, Jammu specified in Annexure- "A" to this Notification, is of adequate ecological, faunal, floral, geomorphological significance for purposes of protecting, propagating and developing Wildlife or its environment.

Now, therefore, in exercise of the powers conferred by section 17 of the Jammu and Kashmir Wildlife (protection) Act, 1978, the Government hereby declare the said area as a Sanctuary.

By Order of the Government of Jammu and Kashmir.

Sd/-
Commissioner/ Secretary to Govt.
Forest Department

No. FST/09/WL/80 Dated : 10-04-1990

Copy for information and necessary action to the: -

1. Secretary to Government, Law Department.
2. Secretary to Government, Revenue Department.
3. Chief Wildlife Warden, Srinagar.
4. Deputy Commissioner of the concerned District.
5. Manager Government Press for favour of Publication in Government Gazette.
6. Stock file.

Sd/-
Under Secretary to Government,
Forest Department

GOVERNMENT OF JAMMU AND KASHMIR
FOREST DEPARTMENT

Notification
Jammu, the 10th April, 1990

SRO ;136-Whereas, it appears to the Government that the area of Ramnagar, Jammu specified in Annexure "A" to this notification is of adequate ecological, faunal, floral, geomorphological significance for the purpose of protecting, propogating and devloping wildlife & its environment.

Now, therefore, in exercise of the powers conferred by section 17 of the Jammu and Kashmir Wildlife Protection Act, 1978, the Government hereby declare the said area as a Sanctuary.

By order of the Governor.

Sd/-
Commr./Secretary to Govt.
Forest Department.

No: FST/9/WL/80 Dated: 10-4-1990

Copy for information and n/action to the:-

1. Secretary to Government Law Department.(w.5.s.c.
2. Secretary to Government Revenue Department.
3. Chief Wildlife Warden Srinagar.
4. Deputy Commissioner, Concerned District.
5. Manager Government Press, Jammu for publication in Government Gazette.

Under Secretary to Govt.
Forest Department

Annexure - II

YEAR WISE STATEMENT OF DEATH/INJURY CASES DUE TO HUMAN WILD ANIMAL CONFLICT IN WILDLIFE DIVISION JAMMU

Year	Total Cases		Cases Settled		Cases Pending		Total amount paid (Rs.)	
	Death	Injury	Death	Injury	Death	Injury	Death	Injury
2006-07	-	1	-	1	-	-	-	12484/-
2007-08	-	1	-	1	-	-	-	19400/-
2008-09	-	2	-	2	-	-	-	15698/-
2009-10	-	1	-	1	-	-	-	7163/-
2010-11	1	5	1	5	-	-	100000/-	2500/-
2011-12	-	1	-	1	-	-	-	38700/-
2012-13	-	01	-	1	-	-	-	14000/-
2013-14	2	-	2	-	-	-	200000/-	-
2014-15	1	-	1	-	-	-	300000/-	-
2015-16	-	02	-	02	-	-	-	30000/-
2016-17	-	02	-	02	-	0	-	8887/-
2017-18	-	-	-	-	-	-	-	-
2018-19	-	09	-	09	-	0	-	200000/-
2019-20	-	01	-	01	-	0	-	242767/-
2020-21	01	-	-	-	01	-	-	-
2021-22	01	04	-	-	01	04	-	-
Total	**05**	**30**	**04**	**26**	**01**	**04**	**600000/-**	**591599/-**

Annexure - III

GOVERNMENT OF JAMMU AND KASHMIR
FOREST, ECOLOGY & ENVIRONMENT DEPARTMENT,
CIVIL SECRETARIAT, J&K, SRINAGAR

Subject : Promotion of Eco-Tourism by allowing Trekking on the identified routes falling inside the Wildlife Protected Areas of the State.

Ref. No.: State Administrative Council Decision No. 160/17/2019 dated 03.07 2019.

Government Order No.: 215 - FST of 2019
Dated : 15 -07-2019

Sanction is hereby accorded to the notification and development of eleven(11) Trekking routes by Wildlife Department, as per the Annexure 'A' of this Government Order for allowing guided Trekking opportunities in pristine Wildlife Protected Areas and involving local communities for livelihood improvement. The Wildlife Department shall workout detailed modalities for management of the Trekking routes/ Programmes.

By order of the Government of Jammu & Kashmir.

Sd/
(Manoj Kumar Dwivedi) IAS
Commissioner/Secretary to Government
Forest. Env. & Ecology Department

No-FST/Land/02/2005 Dated: 15-07-2019

Copy to the:

1. Pr. Chief Conservator of Forests, J&K Srinagar.
2. Chief Wildlife Warden, J&K. Srinagar.
3. Director Archives & Archaeology J&K, Srinagar.
4. OSD with Advisor(K) to Hon'ble Governor, J&K.
5. Pvt Secy. to Commissioner/Secretary to Government, General Administration Department.
6. Pvt Secy. to Commissioner/Secretary to Government, Forest, Env. & Ecology Department.
7. Pvt Secy. to Special Secy.(T), Forest Department.
8. Government Order file (W2 SC).

Riyaz -Ul-Haq
Under Secretary to Government
Forest, Env. & Ecology Department

Annexure to Government Order No: 215 – FST of 2019 dated 15-07-2019

S.No.	Region	Name of the Wildlife Protected Area	Name of the proposed Trekking Route	Length in KMS	Duration of Trek
1.	Kashmir	Brain & Khonmoh Wildlife Conservation Reserve	Cheshmashahi – Zowra	10	1 day (5 Hour Duration Ascend)
2.	-do-	Dara Wildlife Conservation Reserve & Dachigam National Park	Dara – Mahadev – Back	10 x 2	2 day (6 & 4 hour Duration) Ascend as well as Descend
3.	-do-	Overa Aru Wildlife Sanctuary & Dachigam National Park	Aru – Tarsar – Marsar & back	25x2	4 day (6 hour Duration/Day) Ascend /Descend
4.	-do-	Overa Aru Wildlife Sanctuary	Aru – Kolhai Glacier	23 x 2	4 day (6 hour Duration/Day) Ascend /Descend
5.	-do-	Dara Wildlife Conservation Reserve	Dara – Hayen	13	1 day (5 hour Duration) Descend
6.	Jammu	Nandini Wildlife Sanctuary	Nandini to Bail Khad and Back	5.5	1 day (2 hour Duration)
7.	-do-	Sudhmahadev Wildlife Conservation Reserve	Mantalai to Patnitop	12.5	1 day (6 hour Duration)
8.	-do-	Jasrota Wildlife Sanctuary	Sanctuary gate to Gura Surjan	6.0	1 day (3 hour Duration)
9.	-do-	Surinsar Mansar Wildlife Sanctuary	Sagoon Surinsar to Purmandal	12	1 day (6 hour Duration)
10.	-do-	-do-	Covering Forest Co: No 5 & 8/JDR (Staring & End Point Same)	9.8	1 day (4 hour Duration)
11.	-do-	-do-	Covering Forest Co: No 7 JDR (Staring & End Point Same)	7.6	1 day (3.5 hour Duration)

Annexure - IV

DETAIL OF PROTECTED AREA DIVERTED SO FAR FROM RAMNAGAR WLS

S. No.	Name of the Project	User Agency	Year	Area diverted in Ha.
1	Four laning of NH-1A through Ramnagar Wildlife Sanctuary	NHAI	2012	7.97
2	Diversion of 0.459 ha of Forest land from Ramnagar Wildlife Sanctuary for laying of optical fibre cable for Indian Army.	Director General of Signal, Ministry of Defence GOI.	2018	0.459
3	Laying of water supply of water pipes to replace the existing old pipe line in Ramnagar Wildlife Sanctuary	J&K ERA	2019	0.25

Annexure - V

A TABULATED INFORMATION OF RESCUED ANIMALS DURING LAST THREE YEARS (AS PER AVAILABLE OFFICIAL DATA)

List of Wild animals rescued and then safely released to their habitats during last three years

S. No.	Name of wild animal	2018-19	2019-20	2020-21
1	Leopard	02	0	03
2	Barking Deer	02	0	02
3	Hog deer	02	0	0
4	Wild boar	02	0	0
5	Nilgai	01	0	0
6	Monkey	295	0	275
7	Civet Cat	04	04	03
8	Mongoose	03	0	07
9	Cobra Snake	1178	125	1228
10	Russell's Viper	967	75	1340
11	Royal Snake	936	29	767
12	Water Snake	40	10	101
13	Rat Snake	32	05	107
14	Indian Krait Snake	04	03	25
15	Python	05	02	22
16	Wolf Snake	12	01	19
17	Russell's Boa	07	02	22
18	Owl	01	0	10
19	Monitor Lizard	17	14	25
20	Barn Owl	07	0	04
21	Eagle	367	140	720
22	Crow	29	12	48
23	Bat	07	07	12
24	Crane	0	0	02
25	Pangolin	02	0	02
26	King fisher	02	0	01
27	Parrot	09	0	0
28	Grey heron	04	0	0

Annexure - VI

DETAIL OF EQUIPMENTS PROCURED FOR HANDLING OF HUMAN-WILDLIFE CONFLICTS DURING LAST THREE YEARS IN THE WILDLIFE DIVISION JAMMU

S. No.	Particular of item	2018-19	2019-20	2020-21	Total
1	Snake catcher	7	5	3	15
2	Fire extinguisher	2	5	0	07
3	Snake hook	2	1	2	05
4	Cat grabber	01	0	0	01
5	Ketch all pole	3	0	3	06
6	Binocular	2	1	3	06
7	Air gun	2	0	0	02
8	Air pistol	2	0	0	02
9	Jab stick	1	2	0	03
10	DSLR camera	5	2	0	07
11	Anti-snake bite gloves	2	2	4	08
12	Blow pipe	2	0	0	02
13	Snake catching box	0	2	0	02
14	GPS	0	2	0	02
15	Range finder	0	1	0	01
16	Tracking stick	0	2	0	02
17	Camera trap	0	2	0	02
18	Fire suit	0	4	2	06
19	Chain saw	0	3	0	03
20	Net gun	0	2	0	02
21	Sound recorder	0	1	0	01
22	Tranquilizing gun	0	1	0	01
23	Snake handling kit	0	0	2	02
24	Dangri suit	0	0	10	10
25	Trapping cage	0	0	23	23
26	Rope net	4	2	0	06

Annexure - VII
CONTROL FORMS

FORM – 1

Restoration of habitat: Weed control

S.No.	Location & name of site	Year	Extent of area(Ha)	Species of weed	Operation	Total Cost	Cost/ha	Remarks
1	2	3	4	5	6	7	8	9

Location : By compartment, site name or land feature

Operation : Uprooting, cutting, burning, ploughing, manual or by using animals or machinery.

Remarks : Measure of success and or problem faced

FORM – 2

Restoration of habitat: Controlled burning

S.No.	Location & name of site	Year	Extent of area(Ha)	Area treated (ha)	Period	Total Cost	Cost/ha	Remarks
1	2	3	4	5	6	7	8	9

Location : By compartment, site name or land

Feature Period : Date of starting operation and completion.

Remarks : Mention resultant structure (e.g. a mosaic, %burned, % intact), Problems

FORM – 3

Restoration of habitat: Soil conservation measures- Initial operations and subsequent maintenance

S.No.	Location & name of site	Year	Extent of area(Ha)	Area treated (ha)	Period	Total Cost	Cost/ha	Remarks
1	2	3	4	5	6	7	8	9

Location : By compartment, site name or land

Extent of area : Total area identified for such treatment. In case of streams or gullies, the length involved

Area treated : If linear feature then quote length; otherwise area

Operation : Structures involved such as gully plugs, trench-cum-mound, terracing, spurs and bunds etc.

Remarks : Mention if initial work or maintenance.

FORM – 4

Creation of new artificial waterholes

S.No.	Category	Year	Location	Cost	Performance
1	2	3	4	7	8

Category : Masonry anticut, earthen bund, lined depression, borewell and pump, reservoir, spring fed, tanker fed, guzzler, aquifer, permanent or temporary.

Location: By compartment or by a named feature and name given if any

Performance: Successful, Partially successful, failure (give reason for the latter two)

FORM-5

Maintenance of Waterholes - Natural

S.No.	Category	Perenial/ seasonal	Location	Year	Nature of Work	Cost	Performance
1	2	3	4	5	6	7	8

Category : Spring, seep, natural depression, a flowing stretch, reservoir.

Location : By compartment or by a named feature and name given if any

Nature of work : Successful, partially successful, failure (give reason for the latter two)

FORM – 6

Animals – New records

S.No.	Species	Location	Year	How discovered	Details of number, age, sex	Habitat description	Remarks
1	2	3	4	5	6	7	8

Note : Animal will include vertebrates and invertebrates

How discovered : Sighting, dead specimen, reliability of sighting, captured specimen, incontrovertible other evidence.

No., age, sex, etc.: As applicable to vertebrates

Habitat description : Broad habitat description such as vegetation, and elements such as water, large old trees, den trees, snags, down log material. Use microhabitat descriptors only if relevant.

Remarks : Any other useful information

FORM – 7

Animals – Mortality other than that attributable to an offence

S.No.	Species	Location	Year	Sex and age	Number	How discovered	Cause of mortality	Remarks
1	2	3	4	5	6	7	8	9

Location : By compartment, landmark etc.

Sex and age : As per parameters for age class, Sex, if possible, to identify.

He discovered : Carcass, complete or partial, skull or any other recognizable remains collected where only some remains of an animal are found.

Cause of mortality : If known, e.g. territorial fight, accident, possible disease (following postmortem results), old age, cause difficult to determine, predation etc.

Remarks : Any other useful information

FORM – 8

Animals – Mortality attributed to poaching or an act of vandalism

S.No.	Species	Location	Cause of mortality, number, sex, age class	Remarks
1	2	3	4	5

Location : By compartment or landmarks

Cause of mortality : whether the animal was intact or remains found, article or trophy to be recorded, Cause if known e.g. Animal snared, shot, or poisoned etc.

Remarks : Any other useful information, especially matters of illegal trade.

FORM – 9

Animals – Predation on domestic live stock by wild carnivores

S.No.	Range	Month	Category of livestock killed	Location	Number	Compensation paid	Carnivore involved	No. of case Undecided	Remarks
1	2	3	4	5	6	7	8	9	10

Col. 4 : Buffalo, cow, bullock (adult, sub-adult, calf), camel, horse, donkey, sheep, goat, poultry, etc.

Col. 5 : Comptt. No. or landmarks where killed and the village of the owner.

Col. 8 : Indicate species responsible for the kill if identify is confirmed.

Col. 9 : Either in progress or dropped.

Col. 10 : Record observations like- attended or unattended animals, killed in forest or waterhole or in the pen/shed, field and whether kill was in area closed to livestock trespass.

FORM – 10

Animals : Killing of a human by Wild life or injury caused

S.No.	Range	Month	No. of incidents	No. of people killed, age & sex	Location, circumstances & species	No. of people injured, age & sex	Location, circumstances & species	Compenssation (Rs.)
1	2	3	4	5	6	7	8	9

Location, circumstances : Location by camptt. No., the village to which the person belongs and a description of the site and species activity such as- open grassy patch, cutting grass, or under a mahua tree collecting flowers etc. Mention species on proof.

FORM – 11

Animals: Wildlife damage to private or public property

S.No.	Range	Month	The category of property	Extent of damage	Species involved and number	Remarks
1	2	3	4	5	6	7

Location : By comptt. No., village survey no., name of village or land mark.
Category of property : e.g. Agriculture field-wheat, huts in a village, any kind of vehicle.
Extent of damage : Crop damage by area, estimated loss of produce and monetary loss. Similar yard sticks for other items like partial or total destruction of huts and belongings with estimated monetary loss.
Remarks : Any relevant information or circumstances e.g. Wild elephant was provoked by people.

FORM – 12

Plants: New records

S.No.	Range	Kind of produce	Species	Quantity	Revenue realized	Free of change quantity	Agency involved	
							Local people	Out siders
1	2	3	4	5	6	7	8	

Kind of produce : Mention Name, can be biological or geomorphic in origin

Species : If applicable
Quantity : Use the appropriate units
Local people : applies to people within Sanctuary.

FORM – 13
NWFP Collection: Plants and other produce Range

S.No.	Year	Kind of produce	Species	Quantity	Revenue realized	Free of charge quantity	Agency involved	
							Local people	Out siders
1	2	3	4	5	6	7	8	

Kind of produce : Mention Name, can be biological or geomorphic in origin
Species : If applicable
Quantity : Use the appropriate units
Local people : applies to people within Sanctuary.

FORM – 14
Grazing of domestic livestock

S.No.	Year	Grazing unit No.	List of villages in the unit	Village-wise listed population of cattle	Capacity of the unit (cattle units) an number of cattle grazed	Totalcattle unit grazed		Remarks
						Legal	Illegal	
1	2	3	4	5	6	7	8	9

Remarks :
(i) Mention number of cattle immunized against FMD, RP, anthrax as the case might be and the number of cattle without the prophylactic cover
(ii) If grass is allowed to be cut for cattle being stall-fed, mention the village and number of such cattle.

FORM – 15
Programmes of NGO's

S.No.	Year	Name of agency	HQ location	Nature of the scheme operated	Physical & financial targets		Area & location	Remarks
					Given	achieved		
1	2	3	4	6	7	8	9	10

Remarks : Success, adverse impacts, incompatibility with Sanctuary management objectives or failures should be mentioned. These programmes and activities could be within the management area or those that are outside the management area but are capable of influencing the state of the management area- either complimenting efforts or adversely impacting.

FORM – 16 A

Construction of Infrastructure: Roads and Bridges (New) Range

S.No.	Year	Category	Surface	Name or number	Length covered	Cross, drainage works, bridges with type	Total cost and status
1	2	3	4	5	6	7	8

Category of road : National/State highway, district road etc. Public road or open only to managers should be stated

Surface type : Black toped, metal, earth etc. Applies to road.

Name/number : as the case may be

Cross drainage type : e.g. for culverts-box, hosepipe culverts etc.

Bridge Type : Wooden trestle, suspention, metal multy span, masonry arch etc

Status : Work completed or ongoing. State also the agency responsibility; state whether operational or non-operational

FORM – 16 B

Maintenance of Infrastructure: Roads and Bridges (existing) Range

S.No.	Year	Category	Surface	Name or number	Length covered	Cross, drainage works, bridges with type	Total cost and status
1	2	3	4	5	6	7	8

Category of road : National/State highway, district road etc. Public road or open only to managers should be stated

Surface type : Black toped, metal, earth etc. Applies to road.

Name/number : as the case may be

Cross drainage type : e.g. for culverts-box, hosepipe culverts etc.

Bridge Type : Wooden trestle, suspention, metal multy span, masonry arch etc.

Status : Work completed or ongoing. State also the agency responsibility; state whether operational or non-operational

FORM – 17

Construction of Infrastructure: Buildings (New) Range

S.No.	Year	Nature of the building	Location	Type of construction	Number	Total cost	Status
1	2	3	4	5	6	7	8

Nature of the building : E.g. Residential (guard), office, store, chauki, watch tower, tourist facility, hide, barrier, patrolling camp, (temporary/permanent) etc.

Location : The by compartment or village or landmark as appropriate.

Type of construction : Masonry (brick/stone) Log or wooden, metal, local material etc.

Status : Completed or ongoing.

FORM – 18 A

Developing Infrastructure: Fire lines (New)

S.No.	Year	Fire line Category or width	Name of points Connected	Length (Mt)	Cost	Remarks
1	2	3	4	5	6	7

Category : Main or subsidiary etc. Record width

FORM – 18 B

Outbreaks of fires: Ramnagar Wildlife Sanctuary

S.No.	Year	Location	Extant (ha)	Dates		Reason	Estimated loss	Remarks
				Detected	Controlled			
1	2	3	4	5		6	7	8

Location : By compartment

Reason : Established or suspected

Estimated Loss : e.g. no. of trees damaged, stacked firewood/ timber/ bamboo destroyed/ damaged by volume and cost, wild animals dead, particulars of sensitivity sites affected, other property or life destroyed.

Remarks : State particularly problems encountered in detection and suppression and any other useful information .State also whether the extent of fire has been mapped.

FORM – 19

Offence cases detected: Ramnagar Wildlife Sanctuary

S.No.	Year	Category	Numbers	No. of cases detected		No. of cases under process	No. of cases compo unded	Remarks
				Successful	Failure			
1	2	3	4	5		6	7	8

Category : e.g. Illegal cutting of trees, illegal firewood, illegal NWFP, poaching, encroachment, illegal grazing etc, Category be codified by letters of alphabet.

Remarks : Any other useful information. This shouls also inslude the number of cases pending decision with the Department. The cases under col. 8 pertain to area of Non PA status under management which do not involve an endangered species. (Schedule-I).

FORM – 20

Research projects under implementation through PA manpower with or without collaboration with other agencies Ramnagar Wildlife Sanctuary

S.No.	Year	Title	Completed	Ongoing	New	Status	Financial outlay (Rs)	Expenditure incurred (Rs)	Remarks
1	2	3	4	5	6	7	8	9	10

Completed : State date of completion and the status of the project reports

Ongoing : State since when the project is under operation and expected period of completion.

New : State the date of commencement and duration.

Status : State the progress towards achievement of objectives; or projects which has been dropped or held in abeyance etc.

Remarks : Any other relevant information. If the project is collaboration with any other agency or is a contractual arrangement, state the situation and the name of the collaborating agency. If animal/plant specimen are being collected, state authority and where collections are being housed

FORM – 21

Survey and inventories: Ramnagar Wildlife Sanctuary

S.No.	Year	Title of survey, inventory activity	Completed	Ongoing	New	By PA	By other agency	Remarks
1	2	3	4	5	6	7	8	9

Completed : State date of completion of field work and the status of the report
Ongoing : State since when the is it under operation and when is expected to be completed.
New : State the date of commencement and duration.
By PA personal : Will include collaboration or contractual arrangement. State the case as relevant.
Other agency : State the name of the agency.
Remarks : If specimen plants/animals are being collected, state where the collections are being housed and authority. Any other useful information.

FORM – 22

The Monitoring programme: Ramnagar Wildlife Sanctuary

S.No.	Year	Title of the programme	Date of initiation	Responsible agency	Technique	Status of collaborate on and analysis of data	Remarks
1	2	3	4	5	6	7	8

Technique : PCQ, belt transect, line transect and plots, pugmarks etc. by the title of the technique.
Status of collaboration : write only if applicable

FORM – 23

Eco development programme: Targets and implementation Ramnagar Wildlife Sanctuary

S.No.	Year	Nature of the programme	Sector (Central/ State) or NGO sponsored	Target set		Achievements		Village (buffer/ enclaved)	Remark
				Physical	Financial	Physical	Financial		
1	2	3	4	5		6		7	8

Nature of the programme : e.g. pasture development, fodder plantations, establishing biogas plants, livestock improvement, establishment and development of sericulture, revival of local skills such as handicraft, water harvesting systems, adult education. Etc.
Village : Site where programme is being implemented-whether buffer or inside PA.
Remarks : State problems, state failures and thereof, reasons for not attaining targets, for non-implementation or deviation etc. State whether it is on the right tracks in context of achievement of objectives

Annexure - VIII

DETAIL OF DISPUTED LAND/STRUCTURES IN THE SANCTUARY

PRIVATE DISPUTED STRUCTURES/LAND

S. No.	District	Name of the Range	Block	Comptt.	Name of the Possessor	Area in Kanal/ HA	Type of structure
1	Jammu	Wildlife Range Jammu	Sitlian	Co. 3	Anil Lekha S/o Jagdesh Lal Lekha	0.10 kanal	Petrol pump
2	-do-	--do--	Sitlian	--do--	Mohd. Younis S/o Bashir Ahmed & brother	3.00 kanal	Tin roof shed / pakka
3	-do-	--do--	--do--	Co. 2	Mansha S/o Lt. Noor Mohd.	1.00 kanal	Tin roof/ pakka
4	-do-	--do--	--do--	--do--	Fareed Ahmad S/o Lt. Ibrahim Bakerwal	5.00 kanal	Tin roof/ pakka
5	-do-	--do--	--do--	--do--	Kalu Bakerwal S/o Lt. Ibrahim Bakerwal		Tin roof/ pakka
6	-do-	--do--	--do--	--do--	Mohd. Asraf S/o Lt. Ibrahim Bakerwal		Tin roof shed
7	-do-	--do--	--do--	--do--	Akther Hussain S/o Lt. Ibrahim Bakerwal		Thatched roof shed
8	-do-	--do--	--do--	--do--	Mohd. Rafir S/o Lt. Ibrahim Bakerwal		Tin roof shed
9	-do-	--do--	--do--	--do--	Mohd. Sharif S/o Lt. Ibrahim Bakerwal		Tin/ Thatched roof shed
10	-do-	--do--	--do--	--do--	Abdul Wahid S/o Ibrahim		Slab room
11	-do-	--do--	--do--	--do--	Shashi Kumar S/o Subash Chander R/o Karan Nagar	1.13 kanal	Concrete house
12	-do-	--do--	--do--	--do--	Bishamber Dass S/o Mani Ram	11 marla	Houses existing prior to the notification
13	-do-	--do--	--do--	--do--	Satish Kumar S/o Mani Ram		--do--
14	-do-	--do--	--do--	--do--	Pawan Kumar S/o Mani Ram		--do--

15	-do-	--do--	--do--	--do--	Kuldeep kumar S/o Mani Ram		--do--
16	-do-	--do--	--do--	--do--	Hans Raj S/o Nathu Ram	3 marla	--do--
17	-do-	--do--	--do--	--do--	Bali Ram S/o Chat Ram	15 marla	--do--
18	-do-	--do--	--do--	--do--	Puram Chand S/o Chat Ram	3 marla	--do--
19	-do-	-do-	--do--	--do--	Sardar Mohd. S/o Noor Hussain R/o Khanpur	3 kanal	Residential House
20	-do-	--do--	--do--	--do--	Bashir Ahmed S/o Late Balice R/o Nai Basti khanpur	0.3 kanal	Tin shed
21	-do-	--do--	--do--	--do--	Madarsa Khanpur	3 kanal	Madrasa building
22	-do-	--do--	--do--	--do--	Gulam Nabi S/o Gulab din	3 marla	Tin shed
23	-do-	--do--	--do--	--do--	Showkat S/o Wali Mohd R/o Bye pass	2 marlas	
24	-do-	--do--	--do--	--do--	Gulam Mohd S/o Razak	5 marla	
25	-do-	--do--	--do--	--do--	Mumtaz Husain S/o Ab. Reham R/o Kahnpur Nai basti	15 marla	House
26	-do-	--do--	--do--	--do--	Kahleel Hussain S/o Ab. Reham R/o Kahnpur Nai basti	1.00 kanal	--do--
27	-do-	--do--	--do--	--do--	Ilgas S/o Gulam Hussain R/o Bye Pass Nai basti	2 marla	Tin shed
28	-do-	--do--	--do--	--do--	Ata Mohd	2 marla	--do--
29	-do-	--do--	--do--	--do--	Ab. Hafiz S/o Ab. Majeed	3 marla	--do--
30	-do-	--do--	--do--	--do--	Ab. Rashid	2 marla	--do--
31	-do-	--do--	--do--	--do--	Faman Ali S/o Barket Ali & Brothers		Cultivation land

Government Structures

S. No.	District	Name of the Range	Block	Comptt.	Name of the Possessor	Area encroached in Kanal/ HA	Type of structure
1	Jammu	Wildlife Range Jammu	Sitlian	Co. 3	Fishery deptt.	45 kanal	Office building/ staff quarter
2	-do-	--do--	--do--	--do--	PHE deptt.	17 kanal	Filtration plant / office building existing prior to the notification
3	-do-	--do--	--do--	--do--	PDD Deptt.	8 kanal	Office building/ distribution station.
4	-do-	--do--	--do--	--do--	JDA Jammu	02 kanal	Mini bus stand/ passenger shed
5	-do-	--do--	--do--	--do--	GREF Camp	3.00 kanal	Office building

Religious Structures

S. No.	District	Name of the Range	Block	Comptt.	Name of the Possessor	Area encroached in Kanal/ HA	Type of structure
1	Jammu	Wildlife Range Jammu	Sitlian	Co. 3	Muni Baba Ashram	20 kanal	Asharm building existing prior to the notification.
2	-do-	--do--	--do--	--do--	Panjpeer	10 kanal	Peer Baba existing prior to the notification
3	-do-	--do--	--do--	--do--	Temple	3 kanal	Temple exists prior to the notification

Total disputed/Unsettled rights on land/structure = 134.40 kanal

Annexure - IX

Government of Jammu & Kashmir
Office of the Chief Wildlife Warden, J&K

Boulevard Road, Near Lalit Grand Palace, Srl
190001 Tel/Fax No: 0194-2501069 (May-Oct
Manda - Hills (Near Ashoka Hotel) Jammu - 1
Tele/Fax: 0191-2572570 (November-Apr

Minutes of the meeting held under the Chairmanship of Chief Wildlife Warden, Jammu and Kashmir on 21.08.2020 to discuss the draft Management Plans of Wildlife Sanctuaries of Jammu region.

A meeting was held at Wildlife Complex, Manda Jammu under the Chairmanship of the Chief Wildlife Warden, Jammu and Kashmir to discuss the draft Management Plans of Wildlife Sanctuaries of Jammu region on 21.08.2020. The meeting was attended by following members of the committee constituted vide No. 13 of 2020 dated 28.01.2020 and officers:

1. Shri J. Frankoi, IFS, Addl. Pr. CCF, Ecotourism
2. Shri Samuel Changkiza, IFS, CF East Circle, Jammu
3. Dr. Harpreet Kaur, Spl. Secretary, Technical, Forest Administrative Deptt.
4. Shri Vijay Kumar, Wildlife Warden, Kathua
5. Shri Anil Kumar Atri, Wildlife Warden, Jammu
6. Shri Amit Sharma, Wildlife Warden, Jambu Zoo
7. Dr. Arun Gupta, Wildlife Warden, Headquarter / Research
8. Dr. R. S. Katoch, Veterinary Asstt. Surgeon, Jammu
9. Shri Tahir Mahmood Mirza, Wildlife Prosecutor
10. Shri Guldev Raj from NGO (Himalayan Avian).

Regional Wildlife Warden, Jammu could not attend due to health problem.

1

At the outset, the Chief Wildlife Warden J&K welcomed the participants and advised concerned Wildlife Wardens to make presentations one by one. The draft Management Plans of various Wildlife Sanctuaries of Jammu region were presented by the respective Wardens, issues raised during presentation were discussed and decisions taken as under:

1. Surinsar-Mansar Wildlife Sanctuary:

The Wildlife Warden, Kathua made presentation regarding draft Management Plan of Surinsar-Mansar Wildlife Sanctuary. He mentioned that the previous Management Plan of the Sanctuary was not approved by the Competent Authority of the time. He further mentioned that the total area of the Sanctuary as per Notification is 97.82 km^2 wherein almost 50% is agricultural land. After detailed discussions following decisions were taken:

a) The actual area of Sanctuary to be checked on GIS platform.
b) Land use of the sanctuary area during last 10 years through available Google images should be analyzed and incorporated.
c) The financial implications of the plan should be given component wise and not scheme wise.
d) The financial implications should have provisions for rate revision as per standing Government orders.
e) The Management Plan should focus on Sanctuary management and not lake management which is a separate document being prepared by Wildlife Institute of India.
f) The Management Plan should reflect specific measures to conserve key species of the area.
g) While making prescriptions, it should be noted that proposed activities should conform to the provisions of Wildlife Protection Act and relevant orders of the Hon'ble Supreme Court.
h) The Management Plan should be prepared keeping in view the guidelines laid down by Shri W B Sawarkar.
i) The extent of area with respect to forest land, agriculture land, government land and other land need to be worked out and presented in the next meeting.

2

2. Jasrota Wildlife Sanctuary:

Wildlife Warden, Kathua also presented the Management Plan of Jasrota Wildlife Sanctuary. He mentioned that it is a small Sanctuary with 7.60 km^2 area. Various issues during the presentation were discussed and decisions taken as under:

a) The actual area of sanctuary to be checked on GIS platform.
b) Land use of the Sanctuary area during last 10 years through available Google images should be analyzed and incorporated.
c) The financial implications of the plan should be given component wise and not scheme wise.
d) The financial implications should have provisions for rate revision as per standing Government orders.
e) The Management Plan should reflect specific measures to conserve key species of the area.
f) While making prescriptions, it should be noted that proposed activities should conform to the provisions of Wildlife Protection Act and relevant orders of the Hon'ble Supreme Court.
g) The Management Plan should be prepared keeping in view the guidelines laid down by Shri W B Sawarkar.
h) The gap between the Forest area and Sanctuary area, which was not clear in the maps shown during presentation, need to be worked out and clarified in the next meeting.
i) The delineation of boundaries should be clearly recorded in the map after ground verification.
j) The extent of area with respect to forest land, agriculture land, government land and other land need to be worked out and presented in the next meeting.

3. Ramnagar Wildlife Sanctuary:

The draft Management Plan of Ramnagar Wildlife Sanctuary was presented by Wildlife Warden, Jammu. He mentioned that the previous Management Plan was not approved by the Competent Authority of the time.

3

Various issues during the presentation were discussed and decisions taken as under:

a) The actual area of Sanctuary to be checked on GIS platform.
b) Land use of the Sanctuary area during last 10 years through available Google images should be analyzed and incorporated.
c) The financial implications of the plan should be given component wise and not scheme wise.
d) The financial implications should have provisions for rate revision as per standing Government orders.
e) The Management Plan should reflect specific measures to conserve key species of the area.
f) While making prescriptions, it should be noted that proposed activities should conform to the provisions of Wildlife Protection Act and relevant orders of the Hon'ble Supreme Court.
g) The Management Plan should be prepared keeping in view the guidelines laid down by Shri W B Sawarkar.
h) The delineation of boundaries should be clearly recorded in the map after ground verification.
i) The extent of area with respect to forest land, agriculture land, government land and other land need to be worked out and presented in the next meeting.
j) Since the Sanctuary is adjoining Jammu city, adequate focus in the Management Plan should be given to awareness component involving locals keeping in view the monkey menace.
k) The prescriptions should also refer to the balance area of the Sanctuary to be taken over from the Territorial Forest Division.

4. Nandini Wildlife Sanctuary:

The Wildlife Warden, Jammu also presented draft Management Plan of Nandini Wildlife Sanctuary. The Wildlife Prosecutor apprised that some area of the Sanctuary has been diverted for non-forestry uses as per the legal provisions and hence suggested for reworking the boundaries and area. Various issues during the presentation were discussed and decisions taken as under:

4

a) The actual area of Sanctuary to be checked on GIS platform.
b) Land use of the Sanctuary area during last 10 years through available Google images should be analyzed and incorporated.
c) The financial implications of the plan should be given component wise and not scheme wise.
d) The financial implications should have provisions for rate revision as per standing Government orders.
e) The Management Plan should reflect specific measures to conserve key species of the area.
f) While making prescriptions, it should be noted that proposed activities should conform to the provisions of Wildlife Protection Act and relevant orders of the Hon'ble Supreme Court.
g) The Management Plan should be prepared keeping in view the guidelines laid down by Shri W B Sawarkar.
h) The delineation of boundaries should be clearly recorded in the map after ground verification.
i) The extent of area with respect to forest land, agriculture land, government land and other land need to be worked out and presented in the next meeting.
j) The issue with regard to diversion of Sanctuary area for other uses as per orders of Competent Authority need to be examined vis-à-vis terms and conditions laid down by the sanctioning authority. The prescription should mention about taking over of additional area to be added to the Sanctuary in lieu of diversions.

5. Tattakuti Wildlife Sanctuary:

Wildlife Warden, Jambu Zoo presented the draft Management Plan of Tattakuti Wildlife Sanctuary. He mentioned that this is the first attempt to make a Management Plan of this Sanctuary. Various issues during the presentation were discussed and decisions taken as under:

a) The actual area of Sanctuary to be checked on GIS platform.
b) Land use of the Sanctuary area during last 10 years through available Google images should be analyzed and incorporated.

5

c) The financial implications of the plan should be given component wise and not scheme wise.
d) The financial implications should have provisions for rate revision as per standing Government orders.
e) The Management Plan should reflect specific measures to conserve key species of the area.
f) While making prescriptions, it should be noted that proposed activities should conform to the provisions of Wildlife Protection Act and relevant orders of the Hon'ble Supreme Court.
g) The Management Plan should be prepared keeping in view the guidelines laid down by Shri W B Sawarkar.
h) The delineation of boundaries should be clearly recorded in the map after ground verification.
i) The extent of area with respect to forest land, agriculture land, government land and other land need to be worked out and presented in the next meeting.
j) Special focus with regard to the research and survey in the Sanctuary need mention. This is in view of unique features of Sanctuary area.

Office of the CF (WL) Regional Wildlife Warden Jammu
Receipt No. 506
Dated 02-09-2020

Issued with the approval of Chief Wildlife Warden, J&K.

(Dr. Arun Gupta)
Wildlife Warden
Headquarter

No: WLP/Res/Mgmt.Plan/2020/530-37. Date: 28-.08.2020

Copy to the:

1. Conservator of Forests, East Circle, Jammu
2. Regional Wildlife Warden, Jammu Region, Jammu
3. Spl. Secretary, Technical, Forest Administrative Deptt.
4. Wildlife Warden, Kathua
5. Wildlife Warden, Jammu
6. Wildlife Warden, Rajouri-Poonch
7. Wildlife Warden, Jambu Zoo
8. Shri Guldev Raj from NGO (Himalayan Avian).

No: 876-79 dated: 9/9/20
1- Copy forwarded to in order Jammu/Kathua/Rajouri Poonch Jambu Zoo for inf and action
08/09/20

Minutes of the meeting of Standing Committee on draft Management Plan of PA's of Jammu Region.

To discuss the draft Management Plans of Protected Areas of Jammu region, meeting of the Standing Committee constituted vide Order No. 13 of 2020 dated: 28-01-2020 was held on 28th November, 2020 in the Information Centre of Manda Zoo at 10.30 AM.

01). List of Standing Committee members and special invitees' took part in the meeting is listed in ANNEXURE "A" to this MoM.

02). At the outset Member Secretary welcomed Chairman, members and other special invitees and briefed the Committee regarding decision of the previous meeting w.r.t draft Management Plan prepared by Management Plan Officers (MPO) and WWF team lead by Dr Pankaj Chandan in respect of draft Management Plan KHANP.

03). Following were the decision taken Protected Area (PA) wise after detailed deliberation.

(I) **Jasrota Wildlife Sanctuary:**

Wildlife Warden, Kathua Wildlife Division presented the draft Management Plan of Jasrota Wildlife Sanctuary. After giving a brief account on draft revision viz a viz previous decision taken by the SC, WLW Kathua elaborated sanctuary area reconciliation with GIS data and "Land Use Land Cover" change over 10 years time. Following were the various decisions taken after detailed discussion.

a) To carryout ground truthing of change detected in land use pattern and incorporate appropriate management proposal as per Management Plan objectives.
b) To reconsider buffer zone as 500mts and redraw core zone accordingly.
c) To delineate and consolidate boundaries on fringe areas, especially near habitation, accordingly, keeping provisions for Boundary Pillar (BP) installation.
d) Draft MP to incorporate bibliography/references of earlier research/documentation carried out by various research institutions in brief.

Page 1 of 5

e) Keeping in consideration the herbivore population and grazing pressure, draft MP plan to reflect extent of natural blanks/grass lands viz a viz other forest types and identify potential areas as per optimum requirement to be maintained under grass land.

f) Geo-tagging of water bodies and plan for their maintenance.

g) Draft MP to have a special mention about micro biodiversity hot spot and related conservation measures.

h) Wherever feasible management plan to make provision for different management circle like afforestation, improvement, soil moisture conservation, etc.

i) Sufficient plan consideration and financial provisioning for creation and maintenance of Water Harvesting Structures (WHS).

j) Appropriate consideration and financial provisioning for up-gradation/improvement of rescue centre and protection equipments.

k) Adequate mention of religious tourism, its impacts on sanctuary and sustainable measures for mitigation.

l) To reflect optimum staff strength requirement and likely impact of inadequate staffing.

m) Considering the existing high level of slope and erosion potential draft plan to have adequate provision for Catchment Area Treatment (CAT) of major watersheds.

n) Plan proposal for use of modern tools and technology, inter alia to have provision for drone.

(II) **Surinsar-Mansar Wildlife Sanctuary:**

Wildlife Warden, Kathua Wildlife Division presented the draft Management Plan of Surinsar-Mansar Wildlife Sanctuary. After giving a brief account on draft revision viz a viz previous decision taken by the SC, WLW Kathua elaborated sanctuary area reconciliation with GIS data and "Land Use Land Cover" change over 10 years time. Following were the various decisions taken after detailed discussion.

a) To carryout ground truthing of change detected and incorporate appropriate management proposal as per Management Plan objectives.

b) To reconsider buffer zone as 500mts and redraw core zone accordingly.

c) To delineate and consolidate boundaries on fringe areas, especially near habitation, accordingly, keeping provisions for Boundary Pillar (BP) installation.

d) Draft MP to incorporate bibliography/references of earlier research/documentation carried out by various research institutions in brief.

e) Keeping in consideration the herbivore population and grazing pressure, draft MP plan to reflect extent of natural blanks/grass lands viz a viz other forest types and identify potential areas as per optimum requirement to be maintained under grass land.

f) Wherever feasible management plan to make provision for different management circle like afforestation, improvement, soil moisture conservation, etc.

g) Geo-tagging of water bodies and plan for their maintenance.

h) Draft MP to have a special mention about micro biodiversity hot spot and related conservation measures.

i) Sufficient plan consideration and financial provisioning for creation and maintenance of Water Harvesting Structures (WHS).

j) Considering the existing high level of slope and erosion potential draft plan to have adequate provision for Catchment Area Treatment (CAT) of major watersheds.

k) Appropriate consideration and financial provisioning for up-gradation/improvement of rescue centre and protection equipments.

l) Adequate mention of religious tourism, its impacts on sanctuary and sustainable measures for mitigation.

m) To reflect optimum staff strength requirement and likely impact of inadequate staffing.

n) Plan proposal for use of modern tools and technology, inter alia to have provision for drone.

(III) **Kishtwar High Altitude National Park (KHANP):**

Following were the observations of the Standing Committee with respect to revised draft management plan of KHANP.

a) Special section devoting to hangul and snow leop conservation and recovery.

08/02/21

b) Management Plan to address issues of fringe areas including community dependence if any on the KHANP.

c) Adequate focus on importance of aquatic flora and flora.

d) Existing corridor for connecting KHANP with adjoining forest across Pir Panjal, Ladak and Himachal be reflected and referred.

e) Keeping in consideration the herbivore population and grazing pressure, draft MP plan to reflect extent of natural blanks/grass lands viz a viz other forest types and identify potential areas as per optimum requirement to be maintained under grass land.

f) Geo-tagging of water bodies and plan for their maintenance.

g) To reflect optimum staff strength requirement and likely impact of inadequate staffing.

h) Wherever feasible management plan to make provision for different management circle like afforestation, improvement, soil moisture conservation, etc.

i) Plan proposal for use of modern tools and technology, *inter alia* to have provision for drone, camera trap, and voice/weather recorder.

(IV) **Tatakuti Wildlife Sanctuary (TWS):**

Detailed power point presentation on draft management plan of tatakuti wildlife sanctuary was given by Sh. Amit Sharma. Following were the observations of the Standing Committee with respect to draft management plan of TWS.

a) Relevant observations as mentioned in respect of Jasrota and Surinsar-Mansar WS.

b) Ten year change analysis of land use land cover pattern.

c) Management plan for the whole of the wildlife area including freshly notified area of 66 SqKm.

d) Itemized past five year plan allotment and perspective five year budgetary proposals.

e) Special chapters on key species conservation.

f) Separate chapter on Man Animal Conflict including monkey menace.

g) Wherever feasible management plan to make provision for different management circle like afforestation, improvement, soil moisture conservation, etc.

(V) Ramnagar and Nandini Wildlife Sanctuary:

Observations as mentioned in earlier MoM dated 21-08-2020 issued vide communication No. WLP/Res/Mgmt/2020/530-37 dated: 28-08-2020 and relevant comments made out above in respect of Jasrota and Surinsar-Mansar WS.

Issued with the approval of Chief Wildlife Warden, Government of J&K.

03/02/2021

(Dr. Kumar, MK) IFS
Regional Wildlife Warden
Jammu.

No: RWLWJ/2021/ 457-70 **Dated:** 3-02/2021

1. Copy submitted to Chairman Standing Committee (CWLW) for his kind information.
2. Copy to all Committee members for information.

Page 5 of 5

01/04

Department of Wildlife Protection
Office of the Regional Wildlife Warden Jammu
Manda Hills Jammu Near Hotel Ashok Phone : 0191-2544575 Fax: 2520948
email: ccfwildlifejammu@gmail.com

Subject: Minutes of the meeting of Standing Committee on draft Management Plan of PA's of Jammu Region.

To discuss the draft Management Plans of Protected Areas of Jammu Region, meeting of the Standing Committee constituted vide Order No. 13 of 2020 dated: 28-01-2020 was held on 13th February, 2021 in the Information Centre of Manda Zoo at 11.00 AM.

List of Standing Committee members and special invitees' who took part in the meeting is listed in ANNEXURE "A" to this MoM.

At the outset Member Secretary welcomed Chairman, members and other special invitees and briefed the Committee regarding decision of the previous meeting w.r.t draft Management Plan prepared by Management Plan Officers (MPO) and WWF team lead by Dr Rohit Rattan, Associate Coordinator, WWF India in respect of draft Management Plan KHANP.

Following were the decision taken, Protected Area (PA) wise after detailed deliberation.

(I) **Surinsar-Mansar and Jasrota Wildlife Sanctuary:**

Wildlife Warden, Kathua Wildlife Division presented the draft Management Plan of Jasrota Wildlife Sanctuary. The Standing Committee after hearing detailed account on draft revision viz a viz decisions taken by the SC at its previous meetings took following decisions after detailed discussion.

a) In Chapter 2:

1. Details/description of main animals including morphology and scientific nomenclature should be as per latest norms.
2. Main animal list should also reflect IUCN status in addition to status as in Wildlife protection Act 1972 and CITES classification.

b) In Chapter 5:

1. Management Plan ***vision*** should be written as "wildlife management with special emphasis on conservation of biodiversity and watershed management".
2. Management plan ***objective 2*** shall include "management of challenges posed by nilgai, wildboar, porcupine and monkey"
3. Management plan ***objective 3*** should also include capacity building for locals and other resource persons as part of eco-tourism promotion initiative.

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4. Provision for Nature Interpretation Centre (NIC) is kept as enabling for future such consideration.
5. To articulate and include crop loss/damage due to wild animals under Pradhan Mantri Fasal Bima Yojana (PMFBY) for compensation as per admissibility.

c) **Chapter 6:** relating to habitat management/improvement shall *inter alia* to mention about following aspects:
   1. Watershed based soil-moisture conservation approach with the mention of micro-watershed nomenclature.
   2. Other means of animal monitoring like camera trap, thermal recorders, bird call/sound recorder, infra-red camera etc.
   3. Planting/ Sowing of local legume species should be made part of fodder augmentation.

d) Action points related to Management Effectiveness Evaluation (MEE) should be incorporated in the draft.

e) Eco-tourism related activities should be restricted to buffer zone and notified trekking route along with connected details should be enclosed in appropriate chapter.

f) Details of Protected Area (PA) diversion are made part of the draft in the form annexure for the purpose of record, reference and decision support.

(II) **Ramnagar Wildlife Sanctuary:**

Wildlife Warden, Jammu Wildlife Division presented the draft Management Plan of Ramnagar Wildlife Sanctuary. After giving a brief account on draft revision *viz a viz* previous decision taken by the SC, WLW Jammu elaborated sanctuary area reconciliation with GIS data and "Land Use Land Cover" change over 10 years time. Following were the various decisions taken after detailed discussion.

a) Details/description of main animals including morphology and scientific nomenclature should be as per latest norms.

b) Main animal list should also reflect IUCN status in addition to status as in Wildlife protection Act 1972 and CITES classification.

c) Management Plan to have ***vision*** and ***objectives*** (similar to Jasrota Wildlife Sanctuary).

d) Management plan shall include "management of challenges posed by nilgai, wildboar, porcupine and monkey"

e) Management plan should also include capacity building for locals and other resource persons as part of eco-tourism promotion initiative.

f) To articulate and include crop loss/damage due to wild animals under PMFBY for compensation.

g) Action points related to Management Effectiveness Evaluation (MEE) should be incorporated in the draft.

11/05/21

03/24

h) Eco-tourism related activities should be restricted to buffer zone and notified trekking route along with connected details should be enclosed in appropriate chapter.
i) Details of Protected Area (PA) diversion are made part of the draft in the form annexure for the purpose of record, reference and decision support.
j) Watershed based soil-moisture conservation approach with the mention of micro-watershed nomenclature.
k) Other means of animal monitoring like camera trap, thermal recorders, bird call/sound recorder, infra-red camera etc.
l) Planting/ Sowing of local legume species should be made part of fodder augmentation.
m) Very little scope for zonation because of smaller sanctuary size.
n) Provision for chain link fencing of boundary especially area adjoining National Highway or settlement.
o) All trek route to be geo-tagged and detailed in the draft management plan.
p) Pending issue of settlement of local rights is to be mentioned.
q) To reflect optimum staff strength requirement and likely impact of inadequate staffing.
r) Budgetary provision mentioned in the draft management plan to be rationalised.

(III) Kishtwar High Altitude National Park (KHANP):

Observations of the Standing Committee at its meeting dated 28th November, 2020 and relevant record note issued vide No: RWLWJ/2021/4457-70 dated 03-02-2021were reiterated. Accordingly, WWF team lead by Dr. Rohit Rattan after doing the needful and after incorporating other relevant observation as was decided by the SC w.r.t to other NP/S will present their draft to the SC at its next meeting.

(IV) Tatakuti Wildlife Sanctuary (TWS):

Detailed power point presentation on draft management plan of tatakuti wildlife sanctuary was given by Sh. Amit Sharma. Following were the observations of the Standing Committee with respect to draft management plan of TWS.

a) To carryout ground truthing of change deducted in land use pattern and incorporate appropriate management proposal as per Management Plan objectives.
b) To consider buffer zone as 500m and redraw core zone accordingly.
c) To delineate and consolidate boundaries on fringe areas, especially near habitation, accordingly, keeping provisions for Boundary Pillar (BP) installation.
d) Man Animal conflict to be dealt (species, period, damage, intervention, cost, etc.) in a separate chapter.
e) Management Plan draft to have executive summary at the beginning.

11/05/23

04/04

Major animals description containing morphology, zoological name, WLPA 1972, IUCN status, CITES status, etc.

g) Management Plan to have ***vision*** and ***objectives***. (Similar to Jasrota Wildlife Sanctuary).

h) Management plan shall include "management of challenges posed by nilgai, wildboar, porcupine and monkey"

i) Management plan should also include capacity building for locals and other resource persons as part of eco-tourism promotion initiative.

j) To articulate and include crop loss/damage due to wild animals under PMFBY for compensation.

k) Action points related to Management Effectiveness Evaluation (MEE) should be incorporated in the draft.

l) Eco-tourism related activities should be restricted to buffer zone and notified trekking route along with connected details should be enclosed in appropriate chapter.

m) Details of Protected Area (PA) diversion, if any, are made part of the draft in the form annexure for the purpose of record, reference and decision support.

n) Watershed based soil-moisture conservation approach with the mention of micro-watershed nomenclature.

o) Other means of animal monitoring like camera trap, thermal recorders, bird call/sound recorder, infra-red camera etc.

p) Meteorological data of last five years and their interpretation.

q) Provision for Nature Interpretation Centre (NIC)/Rescue Centre are kept as enabling for future such consideration.

r) Draft Management plan to mention details about funding under different schemes during the past five years, budgetary proposal for next five years, various reporting formats, key species conservation/recovery plan, micro-biodiversity hotspots,etc.

s) Detailing of settlement/ pending status of forest rights.

t) Wherever feasible draft management plan to have provision for different management circle like afforestation, improvement, soil moisture conservation, etc.

Issues with the approval of Chief Wildlife Warden, Government of J&K.

11/05/21

(Dr. Kumar, MK) IFS
Regional Wildlife Warden
Jammu

No: RWLWJ/2021/ 814-20 **Dated:** 11-05-2021

1. Copy submitted to Chairman Standing Committee (CWLW) for his kind information.
2. Copy to all Committee members for information.

Department of Wildlife Protection
Office of the Regional Wildlife Warden Jammu
Manda Hills Jammu Near Hotel Ashok Phone : 0191-2544575 Fax: 2520948
email: ccfwildlifcjammu@gmail.com

Subject: Minutes of the meeting of Standing Committee on draft Management Plan of PAs of Jammu Region.

To discuss the draft Management Plans of Protected Areas of Jammu region, meeting of the Standing Committee constituted vide Order No. 13 of 2020 dated: 28-01-2020 was held on 29th may, 2021 in the O/o the Regional Wildlife Warden, Jammu under the Chairmanship of CWLW at 11.00 AM.

List of Standing Committee members and special invitees' took part in the meeting is listed in ANNEXURE "A" to this MoM.

At the outset Member Secretary welcomed Chairman, members and other special invitees and briefed the Committee regarding decision of the previous meeting w.r.t draft Management Plan prepared by Management Plan Officer (MPO) Sh. Anil Athri, WLW Jammu wildlife Division and WWF team lead by Dr. Rohit Rattan, Associate Coordinator WWF India in respect of draft Management Plan of Ramnagar Wildlife Sanctuary and KHANP respectively.

Following were the decision taken Protected Area (PA) wise after detailed deliberation.

01) Ramnagar Wildlife Sanctuary:

MPO gave in depth presentation on chapter wise draft management plan prepared after taking in to account various suggestions made by the SC in its previous meetings. He further elaborated the LULC change analysis, ESZ status & boundary, challenges faced by the sanctuary. Decisions taken after detailed discussion are as under:

i. Annual proposal under CAT plan needs to be enhanced as per the hydrological data, slope and soil characteristics' to improve soil moisture regime of the sanctuary and enhance hydrological provisioning services rendered by the sanctuary.
ii. Mention about the micro-watershed details and their current status in the downstream areas including blockage if any and need for remedial measures.

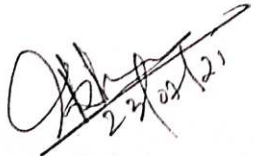
23/07/21

iii. Incorporation of relevant decisions of SC at its meeting dated: 24-05-2021 as recorded in the MoM issued vide No: RWLWJ/2021/1068-76 dated: 27.05.2021.
iv. Incorporate ESZ details as mentioned in the final notification No: S.O 2128(E) dated: 01.06.2021.
v. Incorporate abstract details of research done by various institutions in the recent past and make bibliographic mention of the same.
vi. Incorporate FRA claims and their settlement, if any, in the draft management plan.
vii. The sanctuary and ESZ is traversed by number of road network accordingly management plan to suggest location for safe animal passage, hoardings for advisory/speed limit/awareness, etc.
viii. To make mention for possible future expansion and corridor connectivity as per surrounding forest and landscape.
ix. Budgetary revision and provision for CAT/SMC works, wildlife safe passage, hoardings, special animal rescue tool like tall cranes, etc.
x. Incorporate latest guidelines and circulars in respect of bare conductors/high tension wires as part of threat perception and suggest remedial measures to prevent future such incidences.
xi. Management plan to acknowledge knowledge partners and contributors in the draft.
xii. To have portraits of important species.
xiii. To annex all SCs MoM as part of the draft Management Plan.

02) Kishtwar High Altitude National Park (KHANP):

Dr. Rohit Rattan gave detailed presentation on chapter wise draft management plan prepared after taking in to account various suggestions made by the SC in its previous meetings. Decisions taken after detailed discussion are as under:

i. To carryout modifications carried by Member secretary in the first draft.
ii. Incorporation of relevant decisions of SC at its meeting dated 24-05-2021 as recorded in the MoM issued vide No: RWLWJ/2021/1068-76 dated: 27.05.2021.
iii. Incorporate ESZ details as mentioned in the draft notification No: S.O 121 (E) dated: 12.01.2021.
iv. Incorporate abstract details of research done by various institutions in the recent past and make bibliographic mention of the same.



v. To incorporate location specific details related to firelines, watchtowers, foot bridges, boundary fencing and other infrastructures in the draft management plan.
vi. To show RET species separately in suitable tabular form.
vii. Zone of influence of mega fauna for man-animal interaction to be worked out and mentioned.
viii. Five year metrological data on mean average temperature, rainfall on monthly basis to be mentioned.
ix. To incorporate FRA claims and their settlement, if any, in the draft management plan.
x. Separate chapter on biodiversity management committees, benefit sharing, improvement of livelihood opportunities, etc to be covered.
xi. Grazing aspect to cover annual stock assessment of livestock among fringe/dependent communities, regular revisit of grazing permits and other basic inventories.
xii. To make mention for possible corridor connectivity as per surrounding forest and landscape.
xiii. Management plan to acknowledge the contributions by the knowledge partners and contributors in the draft.
xiv. To have portraits of important species.
xv. To annex all SCs MoM as part of the draft Management Plan.

Meeting ended with vote of thanks.

Issued with the approval of Chief Wildlife Warden, Jammu and Kashmir.

23/07/21

(Dr. Kumar, M K) IFS
Conservator of Forest/
Regional Wildlife Warden,
Jammu

No: RWLWJ/2021/2071-79 **Dated:23-07-2021**

1. Copy submitted to Chairman Standing Committee (CWLW) for his kind information.
2. Copy to all Committee members for information.

Page 3 of 3

Department of Wildlife Protection
Office of the Regional Wildlife Warden Jammu
Manda Hills Jammu Near Hotel Ashok Phone : 0191-2544575 Fax: 2520948
email: ccfwildlifejammu@gmail.com

Subject: Minutes of the meeting of Standing Committee on draft Management Plan of Ramnagar Wildlife Sanctuary.

To discuss the draft Management Plans of Ramnagar Wildlife Sanctuary, meeting of the Standing Committee constituted vide Order No. 13 of 2020 dated: 28-01-2020 was held on 29th of October, 2021 at 11.00 AM.

List of Standing Committee members and special invitees' who took part in the meeting is listed in ANNEXURE "A" to this MoM.

At the outset Member Secretary welcomed Chairman, members and other special invitees and briefed the Committee regarding decision of the previous meeting which was held on 29th May, 2021 w.r.t draft Management Plan prepared by Management Plan Officer (MPO) in respect of Ramnagar Wildlife Sanctuary.

Wildlife Warden Jammu (MPO) in his presentation briefed about observations of the Standing Committee in the past 5 meetings held on 7th August, 2020, 21st August, 2020, 28th November, 2020, 24th May, 2021 and 29th May, 2021 viz-a viz incorporation of relevant observations in the final draft Management Plan of Ramnagar Wildlife Sanctuary. Followed by his remarks, Regional Wildlife Warden Jammu informed the members of the Standing Committee about the completeness of the final draft, minor modifications and document's comprehensiveness.

Following were the decision taken about final draft of Ramnagar Wildlife Sanctuary after detailed deliberation.

1. To carryout corrections/modifications pointed out by members of the Standing Committee in the final draft submitted (hard copy) by the Wildlife Warden Jammu.
2. To highlight Ramnagar Wildlife Sanctuary status as sink (Sanctuary reserve) for rescued animals especially reptiles and birds. Also to mention critical role of Mini-Manda Zoo as a veterinary care cum rescue center for more than 5000 cases of Wildlife annually and the need for commensurating infrastructure and human resources strengthening required to keep continuing these activities. Details (species wise) of animals rescue handled in the past 5 years be included in the Annexure.
3. Wherever, pertains to mention Compartment details for ready reference. Also to include Palm Civet in the animal description chapter.
4. Management Plan document to suggest, the need for review (during the next Management Plan revision) of Ramnagar Wildlife Sanctuary's biodiversity based on previous and recent species documentation to asses any change in species richness, diversity and change analysis.

Final draft Management Plan to make mention of other habitat enrichment activities such as adequate stone heaps, wooden logs and humus points for reptiles, nocturnal animals and butterflies respectively. Also the need for lantana refuge as last option.

6. To mention geo-coordinates of all infrastructures including Watch Tower. To rename nature trail as patrolling path.
7. All data/details about SMC works, plantation, fire-line etc. should be for atleast 5 years.
8. As staff augmentation measures and for effective enforcement, the final draft to mention the need for the deployment of FPF Personnel in adequate strength to prevent illegal activities such as Municipal/construction waste dumping along national highway, defacing of govt. properties, enforcing speed limit/no feeding of wild animals, handling monkey menace etc.
9. To mention the status of existence of disputed public infrastructure, Defence institutions, organizations and department apart from pending status of settlement of rights etc. and correspondence made with respective organizations for settlement/reconciliation.
10. Existing road/patrolling route to be treated as potential fire-lines and requirement for their continue upkeep and maintenance.
11. Importance of having raised (4-5 feet) boundary fencing and phased removal of existing ground level fencing to facilitate free movement of wild animal while enforcing strict grazing regulations.
12. To mention micro water shed code for all streams inside the sanctuary.
13. Re-visit the proposed eco-tourism and eco-development activities to its practical requirement level and focus on skill improvement of dependent interested youth in various nature oriented entrepreneur activities.
14. Re-visit the manpower requirement as projected especially w.r.t Watchers instead of Helpers and nomenclature change of "office of Block Officer" to Block Quarter.
15. Budgetary proposal inter-alia shall reflect:
    i) Funding under research head between 8-12 lakh per annum from the current proposal.
    ii) Component NPCA be deleted as it is not applicable.
    iii) Capping of unforeseen expenses reasonably between 5-7 lakh per annum.
    iv) CAMPA funding should include revalidated amount.
16. Final draft to contain details of final disposed claims under FRA, all MoM, approved FCA cases, ESZ notification, MEE report, Man-animal conflict etc.
17. To make adequate mention of need for Wildlife healthcare monitoring, Quarantine requirements and need for having a re-wilding center etc.
18. The Capex budget, Man-Power deployment and infrastructure existence viz-a-viz their requirement should be Sanctuary specific.

30/X/21

With the above observations, and after satisfying that the earlier observations of the Standing Committee have been incorporated in the draft Ramnagar Wildlife Sanctuary Management Plan; the Standing Committee has unanimously recommended the draft Management Plan presented by the Wildlife Warden Jammu. Further, advised him to circulate the final corrected draft of the Management Plan of Ramnagar Wildlife Sanctuary after incorporating the suggestions of the Standing Committee dated: 29.10.2021 to Standing Committee members for the comments, if any, and to submit it formally to the Chief Wildlife Warden through Regional Wildlife Warden for formal accord of approval.

Finally, meeting ended with the vote of thanks.

Issued with the approval of Chief Wildlife Warden J&K Govt. Jammu.

(Dr. Kumar, MK) IFS
Regional Wildlife Warden
Jammu

No: RWLWJ/2021/ 4395-4402 **Dated:** 30 **-11-2021**

1. Copy submitted to Chairman Standing Committee (CWLW) for his kind information.
2. Copy to all Committee members for information.

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Annexure - X

References:

1. Bird diversity and distribution in mosaic landscapes around Jammu, Jammu & Kashmir, Asha Sohil and Neeraj Sharma, Institute of Mountain Environment, University of Jammu, India
2. Assessing the bird guild patterns in heterogeneous land use types around Jammu, Jammu and Kashmir, India Asha Sohil and Neeraj Sharma, Institute of Mountain Environment, University of Jammu, India.
3. A Preliminary Survey of Bird Communities around Jammu (Jammu & Kashmir) Asha Sohil and Neeraj Sharma Institute of Mountain Environment, University of Jammu.
4. New Lycaenid butterfly records from Jammu & Kashmir, India Shakha Sharma & Neeraj Sharma, Institute of Mountain Environment, University of Jammu.
5. Avian diversity at new Campus of University of Jammu, Jammu and Kashmir, India by Muzaffar Ahmed Kichloo*, Asha Sohil**, Parmil Kumar*** and Neeraj Sharma
6. Vegetation structure, floristic composition and species diversity of woody plant communities in sub-tropical Kandi Siwaliks of Jammu, J & K, India Neeraj Sharma 1 *, Shashi Kant, Institute of Mountain Environment, Bhaderwah Campus, University of Jammu, Bhaderwah, India.
7. Floristic composition, lifeform classification and biological spectrum of district Jammu, Jammu and Kashmir, North - Western Himalayas by Anil K. Raina and Neeraj Sharma.
8. Life form Composition and Biological Spectrum of Ramnagar Wildlife Sanctuary, J&K, India by Sehrish Gazal, Anil K. Raina
9. New nymphalid butterfly records from Jammu & Kashmir, India Shakha Sharma & Neeraj Sharma, Institute of Mountain Environment, Bhaderwah Campus, University of Jammu, Bhaderwah, India
10. Ahmad K, Trag AR, Wani AR, Rahman M (2010b) Endangered Wildlife & Biodiversity of Jammu & Kashmir-Conservation gaps, priorities and way forward (Lead Paper) "International Conference on Wildlife & Biodiversity Conservation vis-à- Climate Change, SKICC, Srinagar (J & K) India on June 3–5.
11. Champion, H.G. & Seth, S.K. 1968. A Revised Survey of the Forests Types of India. New Delhi: Government of India Press.
12. Johnsingh, A.J.T. and Manjrekar, N. 2013 & 2015. Mammals of South Asia, Vol.1 & 2. India, University Press (India) Pvt. Ltd.
13. Kait, R and Sahi, D.N., (2012). Determination of the local, national/global status and effect of urbanization on Carnivora mammals in Jammu District and Trikuta Hills of JandK, India. International Journal of Biodiversity and Conservation Vol. 4(14), pp. 530-534, DOI: 10.5897/IJBC11.145
14. Kamalakannan, M. and Venkatraman, C. 2017. A Checklist of Mammals of India. Updated till October 2017, available at http:// http://zsi.gov.in
15. Menon, V. 2014. Indian mammals- A field guide. Hachette Book Publishing India Pvt. Ltd. 528 pp.