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

The Regional Wildlife Warden,
Kashmir Region, Srinagar.

No. WLP/Tech/2024/ 704-705
Date: 14.10.2024

Subject: Environment Clearance for Uri-1 Stage-II Hydroelectric Project
Biodiversity Conservation & Wildlife Management Plan and Conservation
Plan for Schedule-1 Species-Approval thereof.

Reference: Your RWLW/K/Tech/2024-25/975 dated. 03.10.2024.
Sir,

Regarding the subject, I am directed to convey that the Biodiversity
Conservation & Wildlife Management Plan and Conservation Plan for Schedule-1
Species within a radius of 5 Kms from the nearest Wildlife protected area is hereby
authenticated for conservation of schedule-1 fauna, as an environmental clearance
requirement.

Encl: Copy of authenticated
Conservation Plan.

Yours faithfully

(Ifshan Dewari)
Wildlife Warden
(Technical)

Copy to the:-

1. Wildlife Warden, North Division, Sopore for information. This takes reference to
his No. WLW(N)/Accts/2024-25/333-34 dated 02.09.2024.

Government of Jammu and Kashmir
Department of Wildlife Protection

OFFICE OF THE REGIONAL WILDLIFE WARDEN KASHMIR REGION, SRINAGAR

Fax No. 0194-2955801

Email: rwlw Kashmir@gmail.com

No: RWLW/K/Tech/2024-25/ 1111

Dated: 18/10/2024

- I am directed to forward copy of above to Wildlife Warden, North Division for
information and compliance, please.

Technical Officer

O/o Regional Wildlife Warden, Kashmir



Raybagh, (Near Silk Factory) Srinagar - 190008
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GOVERNMENT OF JAMMU & KASHMIR
OFFICE OF THE PR. CHIEF CONSERVATOR OF FORESTS (WILDLIFE)/
CHIEF WILDLIFE WARDEN

The Regional Wildlife Warden
Kashmir Region, Srinagar.

No. WLP/Tech/2024-25/544
Dated: 11.09.2024

Subject: Environment Clearance for Uri-1 Stage-II Hydroelectric Project
Biodiversity Conservation & Wildlife Management Plan and Conservation
Plan for Schedule-1 Species-Approval thereof.

Reference: Your endorsement No. RWLW/K/Tech/2024-25/890 dated 04.09.2024
Sir,

In reference to your above quoted reference regarding the subject, I am
directed to request you to furnish your comments and resubmit the conservation plan
duly vetted by the Wildlife Warden, North Sopore and countersigned by your goodself,
enabling this department to proceed further into the matter.

Tech. Sec
RwLWk

Yours faithfully

(Ifshan Dewan)
Wildlife Warden
(Technical)

Copy to the:-



1. Wildlife Warden, North Division, Sopore for information and necessary

Department of Wildlife Protection

OFFICE OF THE REGIONAL WILDLIFE WARDEN KASHMIR REGION

Address: Near Ghat No. 21, Police Golf Course Dal Lake Boulevard Road, Srinagar 190001
Phone No: 0194-2955801 E-mail: rwlwjkashmir@gmail.com

No. RWLW/K/Tech/2024-25/975

Dated: 03/10/2024

Copy of above alongwith Biodiversity Conservation & Wildlife Management Plan and
Conservation Plan for Schedule - I species, submitted to Pr. Chief Conservator of Forests
(WL)/Chief Wildlife Warden, J&K, for kind information and further perusal please.

(Technical Officer)

O/o. Regional Wildlife Warden
Kashmir Region

g/c



Department of Wildlife Protection J & K Government
OFFICE OF THE WILDLIFE WARDEN NORTH
KASHMIR DIVISION SOPORE

email: wlwnorth786@gmail.com

The Regional Wildlife Warden
Kashmir Region
Srinagar.

No: WLW(N)/Acctts/2024-25/333-34

Dated: 02 -09-2024

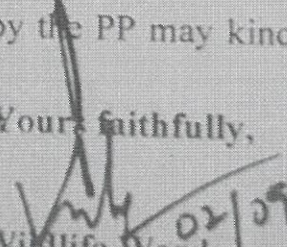
Subject: Environment Clearance for Uri-I Stage-II Hydroelectric Project-
Biodiversity Conservation & Wildlife Management Plan and Conservation Plan
for Schedule-I Species- Approval thereof.

Sir,

Kindly find enclosed herewith the "*Biodiversity Conservation & Wildlife Management Plan and Conservation Plan for Schedule-I Species*" (3 copies) in respect of the Uri-I Stage-II Hydroelectric Project, as received from the Project Proponent (PP), NHPC vide their No. NH/UPS/GM-/2024/70, dated: 31.08.2024. Pertinently, the project area does not fall within the limits of any wildlife Protected Area (PA) or Eco-Sensitive Zone (ESZ). However, as reported by the PP, the Expert Appraisal Committee (EAC) of the Ministry of Environment, Forest and Climate Change in its meeting held on 13.08.2024 has observed that "*The PP shall submit an approved wildlife conservation plan as project location is in close proximity of Wildlife Protected Area*".

It is as such requested that the said plan prepared by the PP may kindly be got approved by the competent authority.

Yours faithfully,


Wildlife Warden

North Kashmir Division
Sopore

Copy submitted to the Pr. Chief Conservator of Forests (Wildlife)/ Chief
Wildlife Warden Jammu and Kashmir Government, Jammu/Srinagar for favor of
information please.

Wildlife warden
North Kashmir Division
Sopore

Biodiversity Conservation and Wildlife Management Plan and Conservation Plan for Schedule-I species



Prepared for:

**URI-I STAGE-II HYDRO ELECTRIC PROJECT
District: Baramulla, Jammu & Kashmir
NHPC. Ltd.**

Prepared by:

R. S. Envirolink Technologies Pvt. Ltd.

403, Bestech Chamber Commercial Plaza,
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[Signature]
Wildlife Warden
North Kashmir Division
Sopore

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Regional Wildlife Warden
Kashmir Region - Srinagar

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1. INTRODUCTION

Uri-I Stage-II Hydro Electric Project is expansion of Uri-I Power Station (Uri-I Stage-I/ Uri-I Project), proposed to be developed on Jhelum River to harness the surplus water of Uri-I Power Station. The Uri-I Project was allotted to M/s NHPC Ltd. Uri-I Power Station was commissioned in the year 1997. The existing structures like 21.5m high barrage (from deepest foundation level), desilting basin, the surface water conveyance system consisting of Head regulator up to HRT intake of Uri-I Project shall be utilized for Uri-I Stage-II HEP. The construction of underground structures like 10.4 km long HRT, surge shaft, pressure shaft, an underground powerhouse complex and 2.28 km long TRT are proposed for Uri-I Stage-II Project.

1.1 PROPOSE OF REPORT

The proposed project does not fall in any protected areas like Wildlife Sanctuary/ National Parks etc. However, in reference to additional conditions of Terms of Reference (ToR) issued by Ministry of Environment, Forest, and Climate Change (MoEF&CC) via letter No. F. No. J-12011/08/2021-IA-I, dated 10th June 2021 (Annexure-I of EIA Report), the User Agency (UA) is required to prepare Biodiversity Conservation Plan and Conservation Plan for the Scheduled I species reported from the study area and submit to State Forest Department for approval and implementation. In pursuant to the condition of ToR, The Biodiversity Management and Wildlife Conservation Plan along with conservation Measures of Schedule-I species is prepared. It is Pertinent to mention that none of the Schedule-I species were reported in the primary survey during EIA/EMP studies, however past records of some Schedule-I species occurring in the study area do exist.

1.2 PROJECT LOCATION

The project is located on Jhelum River, in Uri tehsil of Baramulla district in Union Territory of Jammu & Kashmir. The barrage site is about 2 km from Boniyar (block headquarter) and about 30 km from Uri town (tehsil headquarter). The district headquarters at Baramulla is about 28 km from barrage site.

The nearest railhead is the railway stations Baramulla, although it is not yet connected to the railway network of mainland India. The distance from Baramulla railway station to the project site is about 35 km. The nearest airport at Srinagar is about 88 km (refer Figure 1).

1.3 PROJECT DESCRIPTION

The proposed Uri-I Stage-II HEP is planned as per provision kept in the DPR of Uri-I Power Station. Thus, the already exist structure like barrage, the surface water conveyance system consisting of Head regulator upto Intake of Uri-I Power Station shall be utilized for Uri-I stage-II HEP.

Therefore, the proposed Uri-I Stage-II HEP envisaged the construction of a new Head Race Tunnel(HRT), Surge Shaft, Pressure Shaft, an underground Powerhouse complex and Tail Race Tunnel (TRT). The salient features and Layout map and Index map of proposed Uri-I Stage-IIHEP are given in Figure 2.

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ANNEXURES

Annexure-I: Scoping clearance for the Uri-I Stage-II HEP (240 MW) accorded by MoEF&CC vide letter no. F. No. J-12011/08/2021-IA-I dated 10th June 2021.

c/s

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6-4

- Uri-I Power Station Barrage 95m long and 21.5m high from its deepest foundation level. The full supply water level upstream of the barrage is EL 1491.00m and at barrage top is EL 1495.50m. Spillway consisting of 6 bays and 3 no. under sluice bays.
- A fish way is provided between bay no. 6 and bay no. 7. It is about 150m long with the inlet at EL 1489.0 and the outlet at EL 1475.50.
- Head regulator of 34m length, Headrace canal of about 470m length and 12m width, intake forebay at the downstream end of the canal of 195m, a siphon type surplus escape at a water level of EL 1491.30 and Bonliyar Nalla Intake, culvert and tunnel intake of total length about 250.0m.

- Horseshoe shape HRT of 10.4 km length and 6.50 m diameter in left bank and parallel in valley side to existing HRT.
- 1 no. 5m dia. steel lined pressure tunnels/shafts and 2 no. 3.35m dia. steel lined pressure tunnel for auxiliary units.
- Underground powerhouse cavern housing 2 no, units of 120 MW each.
- Transformer cavern located d/s of powerhouse cavern.
- Draft tube gate operation cavern further d/s of Transformer Cavern 1 no. main TRT of size 6.5m horseshoe shape having tailrace surge galleries
- To facilitate the construction and operation of the project components, suitable adits and access tunnels have been proposed.
- A 6.5 dia. 2.25 km long horseshoe shaped TRT of Stage-II is aligned on valley side and running parallel to the existing stage-I TRT. The TRT is located on the left bank of Jhelum River with TRT out fall near Bandi Village.

1.4.1 Forest Types in the Study Area

The project area falls in Jhelum Valley Forest Division of Jammu and Kashmir Forest Department. A large part of the vegetation is comprised of conifer forests especially in the surrounding of proposed project components. These forests in the study area can be classified following the 'A Revised Survey of the Forest Types of India' by Champion and Seth (1968) and fall under **Group 12-Himalayan Moist Temperate Forest and Group 13-Dry Temperate Forest**. Further, forest in the area fall under following four sub-group:

12/C1/j: Low-level Blue Pine Forest

This type of forest is distributed within an altitude of 1700 to 2300 m on relatively drier but easy slopes as well as fresh alluvium, the Karewa formations and degenerated sites. These forests are dominated by *Pinus wallichiana* and its colonization in the recent and exposed sites is a common feature. These forests are seral in nature and are distributed over the gentle to moderately steep slopes. The associated plant species are *Juglans regia*, *Aesculus indica*, *Parrotiopsis jacquemontiana*, *Viburnum grandiflorum*, *Indigofera heterantha*, *Berberis lycium*, *Rubus* spp, etc.

C/S

13/C2b: Dry Deodar Forest

This type of forest extends from 1600 to 2100 meters elevation, generally as pure crop. However, *Pinus wallichiana* is also mixed occasionally, particularly towards upper limits and on ill drained sites. Other most common associated plant species are *Juglans regia*, *Aesculus indica*, *Ulmus wallichiana*, *Parrotiopsis Jacquemontiana*, *Viburnum grandiflorum*, *Indigofera heterantha*, *Berberis lycium*, *Taraxicum spp.*, etc.

12/Ce: Moist Temperate Deciduous Forest

This type of forest is distributed within an altitude of 1800-2750 meters in moist hollows and depressions often as strips along the hill streams and many of gentler slopes. These forests are comprised of the conifer species like *Pinus wallichiana*, *Abies pindrow* and the floor of valley carries broadleaved forest including *Ulmus villosa*, *Celtis australis*, *Juglans regia*, *Prunus padus*, with *Salix wallichiana* and *Populus ciliata* along the streams.

13/C3: West Himalayan Dry Temperate Deciduous Forest

This forest type is distributed within an altitudinal range of 1800 to 2700 meters and extends well into the dry zone behind the Himalayan axis, with rainfall under 1000 mm. This type is edaphic post climax to the coniferous forest on the slope. The common plant species are *Juglans regia*, *Prunus cornuta*, *Aesculus indica*, *Acer pictum*, *Salix spp.*, *Populus spp.*, *Parrotiopsis jacquemontiana*, *Viburnum grandiflorum*, *Skimmia spp.*, *Indigofera heterantha*, *Sambucus spp.*, *Rosa spp.*, *Rumex nepalensis*, etc.

1.4.2 Floral Diversity in Study Area

A total of 192 plant species, belonging 67 families, were reported in the study area. A brief description of number of plant species recorded in various taxonomic groups is given in the following paragraphs. Details of plant species recorded during the field surveys within families are given at Table 1.

Table 1: Number of species of different plant groups reported from the study area

S. No.	Habit	No. of Families	No. of Genera	No. of Species
1	Angiosperms			
	Trees	15	23	26
	Shrubs	21	34	39
	Herbs	31	84	90
	Grasses	2	10	13
	Climbers	6	6	6
2	Gymnosperms			
	Trees	2	5	5
	Shrubs	2	2	3
3	Pteridophytes	2	3	3
4	Bryophytes	2	2	2
5	Lichens	4	5	5

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i. Angiosperms

As per data collected during 3 seasons (monsoon, winter and pre-monsoon) field surveys, an inventory of 174 species of plants belonging to angiosperms was compiled which includes plant species found in forested areas, scrub land, near agricultural fields and settlements, abandoned land, etc. This list includes 26 species of trees, 39 species of shrubs, 90 species of herbaceous plants, 13 species of grasses and 6 species of climbers. Dominant families in the area are Asteraceae (27 species) and Rosaceae (20 species), followed by Poaceae (10 species), Lamiaceae (10 species) and Fabaceae (8 species). List of angiosperms recorded from the area is given in Table 2.

Table 2: List of Angiosperms recorded from the study area

S. No.	Family / Botanical Name	Habit
	Acanthaceae	
1	<i>Justicia adhatoda</i>	Shrub
2	<i>Strobilanthes attenuata</i>	Herb
	Aceraceae	
3	<i>Acer caesium</i>	Tree
	Adoxaceae	
4	<i>Viburnum cotinifolium</i>	Shrub
5	<i>Viburnum grandiflorum</i>	Shrub
	Amaranthaceae	
6	<i>Achyranthes bidentata</i>	Herb
7	<i>Axyris hybrida</i>	Herb
8	<i>Chenopodium album</i>	Herb
9	<i>Gomphrena celosioides</i>	Herb
	Apiaceae	
10	<i>Angelica glauca</i>	Herb
11	<i>Carum carvi</i>	Herb
12	<i>Chaerophyllum reflexum</i>	Herb
13	<i>Heracleum lanatum</i>	Herb
	Araliaceae	
14	<i>Hedera nepalensis</i>	Climber
	Asclepiadaceae	
15	<i>Vincetoxicum hirundinaria</i>	Herb
	Asteraceae	
16	<i>Ageratina adenophora</i>	Shrub
17	<i>Artemisia nilagirica</i>	Shrub
18	<i>Achillea millefolium</i>	Herb
19	<i>Ainsliaea aptera</i>	Herb
20	<i>Anaphalis contorta</i>	Herb
21	<i>Anthemis cotula</i>	Herb
22	<i>Artemisia filifolia</i>	Herb
23	<i>Aster thomsonii</i>	Herb
24	<i>Bidens pilosa</i>	Herb
25	<i>Carduus edelbergii</i>	Herb
26	<i>Centaurea iberica</i>	Herb
27	<i>Cichorium intybus</i>	Herb
28	<i>Cirsium wallichii</i>	Herb
29	<i>Conyza aegyptiaca</i>	Herb
30	<i>Erigeron canadensis</i>	Herb
31	<i>Cousinia thomsonii</i>	Herb
32	<i>Dichrocephala integrifolia</i>	Herb
33	<i>Erigeron bonariensis</i>	Herb
34	<i>Erigeron multiradiatus</i>	Herb
35	<i>Erigeron trilobus</i>	Herb
36	<i>Galinsoga parviflora</i>	Herb

S. No.	Family / Botanical Name	Habit
37	<i>Inula racemosa</i>	Herb
38	<i>Saussurea costus</i>	Herb
39	<i>Jacobaea analoga</i>	Herb
40	<i>Sonchus mauritanicus</i>	Herb
41	<i>Taraxacum officinale</i>	Herb
42	<i>Youngia japonica</i>	Herb
	Balsaminaceae	
43	<i>Impatiens edgeworthii</i>	Herb
44	<i>Impatiens glandulifera</i>	Herb
	Berberidaceae	
45	<i>Berberis lycium</i>	Shrub
	Betulaceae	
46	<i>Alnus nitida</i>	Tree
47	<i>Corylus jacquemontii</i>	Tree
	Boraginaceae	
48	<i>Arnebia benthamii</i>	Herb
49	<i>Cynoglossum zeylanicum</i>	Herb
	Brassicaceae	
50	<i>Arabidopsis thaliana</i>	Herb
51	<i>Capsella bursa-pastoris</i>	Herb
52	<i>Rorippa indica</i>	Herb
	Cannabaceae	
53	<i>Celtis australis</i>	Tree
54	<i>Cannabis sativa</i>	Herb
	Caprifoliaceae	
55	<i>Lonicera angustifolia</i>	Shrub
56	<i>Sambucus wightiana</i>	Shrub
57	<i>Valeriana jatamansi</i>	Herb
	Caryophyllaceae	
58	<i>Arenaria serpyllifolia</i>	Herb
59	<i>Stellaria monosperma</i>	Herb
	Celastraceae	
60	<i>Euonymus lucidus</i>	Tree
	Convolvulaceae	
61	<i>Cuscuta reflexa</i>	Herb
	Cyperaceae	
62	<i>Carex infusata</i>	Grass
63	<i>Carex obscura</i>	Grass
64	<i>Eriophorum comosum</i>	Grass
	Dioscoreaceae	
65	<i>Dioscorea deltoidea</i>	Climber
	Elaeagnaceae	
66	<i>Elaeagnus umbellata</i>	Shrub
	Euphorbiaceae	

S. No.	Family / Botanical Name	Habit
67	<i>Ricinus communis</i>	Shrub
68	<i>Euphorbia pilosa</i>	Herb
	Fabaceae	
69	<i>Bauhinia variegata</i>	Tree
70	<i>Robinia pseudoacacia</i>	Tree
71	<i>Desmodium elegans</i>	Shrub
72	<i>Indigofera cassioides</i>	Shrub
73	<i>Spartium junceum</i>	Shrub
74	<i>Lespedeza cuneata</i>	Herb
75	<i>Oxytropis humifusa</i>	Herb
76	<i>Trifolium pratense</i>	Herb
	Geraniaceae	
77	<i>Geranium lucidum</i>	Herb
78	<i>Geranium nepalense</i>	Herb
79	<i>Geranium wallichianum</i>	Herb
	Grossulariaceae	
80	<i>Ribes glaciale</i>	Shrub
	Hippocastanaceae	
81	<i>Aesculus indica</i>	Tree
	Hydrangeaceae	
82	<i>Deutzia staminea</i>	Shrub
	Hypericaceae	
83	<i>Hypericum oblongifolium</i>	Shrub
	Iridaceae	
84	<i>Iris kashmiriana</i>	Herb
	Juglandaceae	
85	<i>Juglans regia</i>	Tree
	Lamiaceae	
86	<i>Caryopteris odorata</i>	Shrub
87	<i>Isodon rugosus</i>	Shrub
88	<i>Ajuga bracteosa</i>	Herb
89	<i>Clinopodium umbrosum</i>	Herb
90	<i>Elsholtzia ciliata</i>	Herb
91	<i>Lamium album</i>	Herb
92	<i>Nepeta laevigata</i>	Herb
93	<i>Origanum vulgare</i>	Herb
94	<i>Prunella vulgaris</i>	Herb
95	<i>Thymus linearis</i>	Herb
	Lythraceae	
96	<i>Punica granatum</i>	Shrub
	Malvaceae	
97	<i>Grewia optiva</i>	Tree
98	<i>Malva verticillata</i>	Herb
	Meliaceae	
99	<i>Toona ciliata</i>	Tree
100	<i>Toona sinensis</i>	Tree
	Moraceae	
101	<i>Ficus Palmata</i>	Tree
102	<i>Morus serrata</i>	Tree
	Nitrariaceae	
103	<i>Peganum harmala</i>	Herb
	Oleaceae	
104	<i>Fraxinus excelsior</i>	Tree
105	<i>Chrysojasminum humile</i>	Shrub
	Oxalidaceae	
106	<i>Oxalis corniculata</i>	Herb
	Papaveraceae	
107	<i>Argemone mexicana</i>	Herb
108	<i>Corydalis crassifolia</i>	Herb

S. No.	Family / Botanical Name	Habit
	Plantaginaceae	
109	<i>Digitalis purpurea</i>	Herb
110	<i>Lindenbergia grandiflora</i>	Herb
111	<i>Plantago lacustris</i>	Herb
112	<i>Plantago major</i>	Herb
	Platanaceae	
113	<i>Platanus orientalis</i>	Tree
	Poaceae	
114	<i>Agrostis pilosula</i>	Grass
115	<i>Apluda mutica</i>	Grass
116	<i>Aristida depressa</i>	Grass
117	<i>Arundo donax</i>	Grass
118	<i>Chrysopogon fulvus</i>	Grass
119	<i>Eragrostis pilosa</i>	Grass
120	<i>Festuca kashmiriana</i>	Grass
121	<i>Poa annua</i>	Grass
122	<i>Poa himalayana</i>	Grass
123	<i>Poa stapfiana</i>	Grass
	Polygonaceae	
124	<i>Polygonum molle</i>	Herb
125	<i>Fagopyrum acutatum</i>	Herb
126	<i>Oxyria digyna</i>	Herb
127	<i>Persicaria nepalensis</i>	Herb
128	<i>Rumex hastatus</i>	Herb
129	<i>Rumex nepalensis</i>	Herb
	Primulaceae	
130	<i>Myrsine africana</i>	Shrub
131	<i>Primula denticulata</i>	Herb
	Ranunculaceae	
132	<i>Caltha palustris</i>	Herb
133	<i>Delphinium denudatum</i>	Herb
134	<i>Ranunculus arvensis</i>	Herb
135	<i>Thalictrum elegans</i>	Herb
136	<i>Clematis montana</i>	Climber
	Rhamnaceae	
137	<i>Rhamnus virgatus</i>	Shrub
	Rosaceae	
138	<i>Malus baccata</i>	Tree
139	<i>Prunus armeniaca</i>	Tree
140	<i>Prunus padus</i>	Tree
141	<i>Pyrus pashia</i>	Tree
142	<i>Sorbus cuspidata</i>	Tree
143	<i>Cotoneaster microphyllus</i>	Shrub
144	<i>Crataegus oxyacantha</i>	Shrub
145	<i>Prinsepia utilis</i>	Shrub
146	<i>Pyracantha crenulata</i>	Shrub
147	<i>Rosa macrophylla</i>	Shrub
148	<i>Rosa moschata</i>	Shrub
149	<i>Rosa webbiana</i>	Shrub
150	<i>Rubus foliosus</i>	Shrub
151	<i>Rubus macilentus</i>	Shrub
152	<i>Rubus niveus</i>	Shrub
153	<i>Sorbaria tomentosa</i>	Shrub
154	<i>Spiraea canescens</i>	Shrub
155	<i>Potentilla indica</i>	Herb
156	<i>Fragaria vesca</i>	Herb
157	<i>Rosa brunonii</i>	Climber
	Rubiaceae	
158	<i>Leptodermis lanceolata</i>	Shrub

S. No.	Family / Botanical Name	Habit
159	<i>Rubia cordifolia</i>	Climber
	Rutaceae	
160	<i>Skimmia laureola</i>	Shrub
	Salicaceae	
161	<i>Populus ciliata</i>	Tree
162	<i>Salix alba</i>	Tree
163	<i>Salix tetrasperma</i>	Tree
	Saxifragaceae	
164	<i>Bergenia ciliata</i>	Herb
165	<i>Saxifraga saginoides</i>	Herb
	Scrophulariaceae	
166	<i>Buddleja asiatica</i>	Shrub
167	<i>Verbascum thapsus</i>	Herb
	Simaroubaceae	
168	<i>Ailanthus excelsa</i>	Tree
	Ulmaceae	
169	<i>Ulmus wallichiana</i>	Tree
	Urticaceae	
170	<i>Boehmeria macrophylla</i>	Shrub
171	<i>Girardinia diversifolia</i>	Shrub
172	<i>Pouzolzia zeylanica</i>	Herb
173	<i>Urtica dioica</i>	Herb
	Vitaceae	
174	<i>Parthenocissus semicordata</i>	Climber

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ii. Gymnosperms

Gymnosperms in the area are represented by 8 species belonging to 3 families and 7 genera. A list of gymnosperms recorded from the study area is given in Table 3.

Table 3: List of Gymnosperms recorded from the study area

S. No.	Family	Scientific Name
1	Cupressaceae	<i>Cupressus sempervirens</i>
2	Cupressaceae	<i>Juniperus communis</i>
3	Ephedraceae	<i>Ephedra vulgaris</i>
4	Ephedraceae	<i>Ephedra gerardiana</i>
5	Pinaceae	<i>Abies pindrow</i>
6	Pinaceae	<i>Cedrus deodara</i>
7	Pinaceae	<i>Picea smithiana</i>
8	Pinaceae	<i>Pinus wallichiana</i>

iii. Lower Plants (Pteridophytes and Bryophytes)

In the study area presence of pteridophytes and bryophytes was observed along the streams and moist and wet places. The Pteridophyte group is represented by 3 species belonging to 3 genera and 2 families. *Athyrium foliolosum*, *Pteris cretica* and *Pteridium aquilinum* are dominant pteridophyte species in the area. Bryophytes in the study area are represented by 2 species belonging to 2 families. *Funaria hygrometrica* and *Marchantia paleacea* are commonly found bryophytes in the study area. The list of Pteridophytes and Bryophytes recorded from the study area are list below in Table 4.

Table 4: List of lower plants recorded from the study area

S. No.	Family	Name of Species
Pteridophytes		
1	Athyriaceae	<i>Athyrium foliolosum</i>
2	Pteridaceae	<i>Pteris cretica</i>
3	Pteridaceae	<i>Pteris aquilinum</i>
Bryophytes		
1	Funariaceae	<i>Funaria hygrometrica</i>
2	Marchantiaceae	<i>Marchantia paleacea</i>

iv. Lichens

During field survey four genus of Liches were recorded from the study area. List of Lichen recorded are given below in Table 5.

Table 5: List of lichens recorded from the study area

S. No.	Family	Scientific Name
1	Physciaceae	<i>Anaptychia sp.</i>
2	Cladoniaceae	<i>Cladonia sp.</i>
3	Parmeliaceae	<i>Flavoparmelia sp.</i>
4	Parmeliaceae	<i>Usnea sp.</i>
5	Teloschistaceae	<i>Xanthoria sp.</i>

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1.4.2.1 Rare, Endangered, and Threatened Plant Species

The conservation status (Rare, Endangered, and Threatened) of all 192 species of plants reported from the study area was assessed by consulting Red Data Book of Indian Plants and IUCN Red List of Threatened Species Version 2022-2.

As per the Red Data Book of Indian Plants published by Botanical Survey of India, *Acer caesium*, *Dioscorea deltoidea* and *Inula racemosa* are listed as Vulnerable (VU) species, while *Saussurea costus* is listed as Endangered (EN) species.

Out of 192 plant species reported from the study area, only 66 species were evaluated by IUCN ver. 2022-2. As per the IUCN Red List of Threatened Species 2022-2, *Saussurea costus* was listed under Critically Endangered (CR), *Angelica glauca* under Endangered (EN), *Ephedra gerardiana*, *Marchantia paleacea* and *Ulmus wallichiana* under Vulnerable (VU), *Sonchus mauritanicus* and *Fraxinus excelsior* were listed under Near Threatened (NT) category. The rest of the species evaluated are either Least Concern (LC) or Data Deficient (DD) category.

1.4.3 Faunal Elements

The fauna of the study area has been compiled with the help of sighting during field surveys, supplemented with secondary sources and information provided by local people during a field survey in the study area. For the preparation of a checklist of fauna in the study area, the Forest Working Plan of Jhelum Valley Forest Division and ZSI Publication were consulted.

1.4.3.1 Mammals

a. Presence of Mammals based upon Field Surveys

During field surveys only Rhesus macaque (*Macaca mulatta*) and Small Indian Mongoose (*Herpestes auropunctatus*) are the species sighted in the study area. Besides these, no other wild animal was sighted during field investigation. A list of mammals commonly reported in the area is listed in Table 3.42.

b. Data on mammals based upon secondary Data

The data on mammals reported from the study area was compiled from the Forest Working Plan (implanting years 2020-21 to 2030-31) of the Jhelum Valley Forest Division after consultation with forest officials and villagers. Forest officials mention the presence of Common Leopard (*Panthera pardus*), Kashmir Grey Langur (*Semnopithecus ajax*), Himalayan Goral (*Naemorhedus goral*) and Asiatic Black Bear (*Ursus thibetanus*) in the proposed study area and same was confirmed by villagers. Besides, the villagers also mentioned the presence of Red Fox (*Vulpes vulpes*) and Jackal (*Canis aureus*) in the area. However, no direct or indirect evidence could be recorded during the field survey about their presence in and around the project area.

Based on primary data collected during field survey and supplemented with secondary data, a list of 23 species of mammals with their conservation status reportedly found in the study area was compiled and the same is given in Table 6.

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Table 6: List of Mammalian species reportedly found in the study area

Table 6. List of mammalian species reportedly found in the study area				
S. No.	Family/Scientific name	Common name	Conservation status	
			IUCN 2022-2	WPA 1972
	ORDER: CETARTIODACTYLA			
	Family - Cervidae			
1	<i>Naemorhedus bedfordi</i>	Grey Goral	NT	I
	Family - Moschidae			
2	<i>Moschus Cupreus</i>	Kashmir Musk Deer	EN	I
	Family - Suidae			
3	<i>Sus scrofa</i>	Wild Boar	LC	III
	ORDER: CARNIVORA			
	Family - Felidae			
4	<i>Panthera pardus</i>	Leopard	VU	I
5	<i>Prionailurus bengalensis</i>	Leopard Cat	LC	I
6	<i>Felis chaus</i>	Jungle Cat	LC	II
	Family - Herpestidae			
7	<i>Herpestes edwardsii</i>	Grey mongoose	LC	II
8	<i>Herpestes auropunctatus</i>	Small Indian mongoose	LC	II
	Family - Canidae			
9	<i>Canis aureus</i>	Golden Jackal	LC	II
10	<i>Vulpes vulpes</i>	Red Fox	LC	II
11	<i>Canis lupus</i>	Tibetan Wolf	LC	I
	Family - Ursidae			
12	<i>Ursus thibetanus</i>	Asiatic Black Bear	VU	II
	Family - Mustelidae			
13	<i>Mustela sibirica</i>	Siberian Weasel	LC	II
14	<i>Lutra lutra</i>	Eurasian Otter	NT	II
	ORDER: PRIMATES			
	Family - Cercopithecidae			
15	<i>Macaca mulatta</i>	Rhesus Macaque	LC	II
16	<i>Semnopithecus ajax</i>	Kashmir Grey Langur	EN	II
	ORDER: RODENTIA			
	Family - Hystricidae			
17	<i>Hystrix indica</i>	Indian Crested Porcupine	LC	IV
	Family - Sciuridae			
18	<i>Eoglaucomys fimbriatus</i>	Kashmir Flying Squirrel	LC	-

IUCN- International Union for Conservation of Nature; VU – Vulnerable; EN: Endangered; NT- Near Threatened; LC - Least Concern; WPA – Wildlife (Protection) Act, 1972

1.4.3.2 Avifauna

As time constraint and accessibility plays an important role in conducting the survey, birds were sampled on the same transect and trails marked for mammals. Sampling was carried out on a fixed width trails of 2 km wherever the terrain permits.

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During the field survey, a total number of 25 bird species were sighted during the field survey. A large portion of avifauna species is comprised of resident birds in the project study area. Himalayan Bulbul, Black Bulbul, Russet Sparrow, Ashy Drongo, Black-eared Kite, Plumbeous Water Redstart, Slaty-headed Parakeet and Long-tailed Shrike were the most frequently sighted bird species in the study area.



Based on the sighted birds during the field survey, an inventory of avifauna was prepared which is enlisted in Table 7.

Table 7: List of avifauna recorded from the study area with their conservation status

S. No.	Family	Common Name	Scientific Name	Conservation Status		Residential Status
				IUCN 2022-2	WPA 1972	
	ORDER: BUCEROTIFORMES					
1	Upupidae	Common Hoopoe	<i>Upupa epops</i>	LC	IV	SV
	ORDER: ACCIPITRIFORMES					
2	Accipitridae	Black-eared Kite	<i>Milvus migrans</i>	LC	IV	RR
3	Accipitridae	Booted Eagle	<i>Hieraetus pennatus</i>	LC		RR
	ORDER: COLUMBIFORMES					
4	Columbidae	Eurasian Collared Dove	<i>Spilopelia decaocto</i>	LC	IV	RR
5	Columbidae	Rock Pigeon	<i>Columba livia</i>	LC	IV	RR
	ORDER: PASSERIFORMES					
6	Motacillidae	White Wagtail	<i>Motacilla alba</i>	LC	IV	SV
7	Motacillidae	Grey wagtail	<i>Motacilla cinerea</i>	LC	IV	SV
8	Motacillidae	Yellow wagtail	<i>Motacilla flava</i>	LC	IV	SV
9	Passeridae	Russet Sparrow	<i>Passer cinnamomeus</i>	LC	IV	RR
10	Passeridae	House Sparrow	<i>Passer domesticus</i>	LC	IV	RR
11	Laniidae	Long-tailed Shrike	<i>Lanius schach</i>	LC	IV	SV
12	Muscicapidae	White Capped water Redstart	<i>Phoenicurus leucocephalus</i>	LC	IV	RR
13	Muscicapidae	Plumbeous water Redstart	<i>Phoenicurus fuliginosus</i>	LC	IV	RR
14	Dicruridae	Ashy Drongo	<i>Dicrurus leucophaeus</i>	LC	IV	SV
15	Pycnonotidae	Black bulbul	<i>Hypsipetes leucocephalus</i>	LC	IV	RR
16	Pycnonotidae	Himalayan Bulbul	<i>Pycnonotus leucogenys</i>	LC	IV	RR
17	Sturnidae	Common Myna	<i>Acridotheres tristis</i>	LC	IV	RR
18	Corvidae	Yellow-billed Blue Magpie	<i>Urocissa flavirostris</i>	LC	IV	RR
19	Monarchidae	Indian Paradise-flycatcher	<i>Terpsiphone paradisi</i>	LC	IV	SV
20	Muscicapidae	Grey Bushchat	<i>Saxicola ferreus</i>	LC	IV	RR
21	Muscicapidae	Blue Whistling-thrush	<i>Myophonus caeruleus</i>	LC	IV	RR
22	Corvidae	Eurasian Jackdaw	<i>Corvus monedula</i>	LC	IV	RR
23	Corvidae	Large-billed crow	<i>Corvus macrorhynchos</i>	LC	IV	RR
24	Corvidae	House Crow	<i>Corvus splendens</i>	LC	V	RR
	ORDER: PSITTACIFORMES					
25	Psittacidae	Slaty-headed Parakeet	<i>Himalayapsitta himalayana</i>	LC	IV	RR

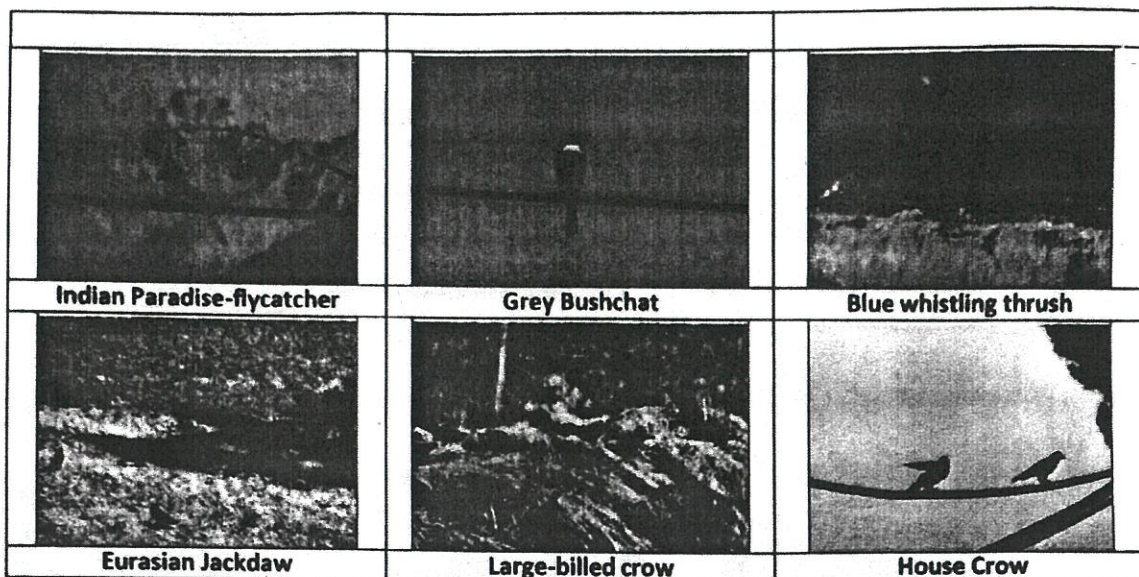
IUCN- International Union for Conservation of Nature; LC - Least Concern; WPA - Wildlife (Protection) Act, 1972.; RR: Resident; SV: Summer Visitor; PV: Passage Visitor

FAUNAL SPECIES SIGHTED DURING FIELD SURVEY

		
Small Indian Mongoose	Rhesus Macaque	Common Hoopoe
		
Slaty-headed Parakeet	Black-eared Kite	Eurasian Collared Dove
		
Rock Pigeon	Grey wagtail	White wagtail
		
House Sparrow	Himalayan Bulbul	Russet sparrow
		
Long tailed shrike	Plumbeous Water Redstart	White capped Water Redstart
		
Common Myna	Ashy Drongo	Yellow-Billed blue Magpie

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1.4.3.3 Herpetofauna

The herpetofauna were sampled on the same transect marked for mammals. The sampling also carried along riverbanks and the sampling was repeated during evening time following the time constrained Visual Encounter Rates (VES) method. During the survey, Garden Lizard (*Calotes versicolor*), Kashmir Rock Agama (*Laudakia tuberculata*), and Skinks (*Asymblepharus ladacensis*) were commonly sighted species in the area. Common Rat Snake (*Ptyas mucosa*) and Himalayan Pit Viper (*Gloydius himalayanus*) are also reported in the Working Plan of Jhelum Valley Forest Division.

1.4.3.4 Butterflies

Based on monsoon, winter and pre-monsoon season field survey, an inventory of butterflies was prepared which is enlisted in Table 3.44. The butterflies belong to families Lycaenidae, Nymphalidae and Pieridae family represents maximum species of butterfly in the proposed project area.

Table 8: Butterflies recorded from Study Area

S. No.	Family	Scientific name	Common name
1	Lycaenidae	Lycaena phlaeas	Small Copper
2	Nymphalidae	Aglais cachmirensis	Indian Tortoiseshell
3	Nymphalidae	Vanessa cardui	Painted Lady
4	Pieridae	Pieris canidia indica	Indian Cabbage White
5	Pieridae	Colias fieldii	Clouded Yellow
6	Pieridae	Euchloe daphalis	Pearl white

IUCN Ver 2022-2; LC: Least Concern; NA: Not Assessed

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1.4.3.5 Conservation Status of Fauna

IUCN Red List of Threatened Species Version 2022-23 categorises *Moschus Cupreus* (Kashmir Musk Deer) and *Semnopithecus ajax* (Kashmir Grey langur) under the Endangered (EN) category. *Panthera pardus* (Common Leopard) and *Ursus thibetanus* (Asiatic Black Bear) are listed under Vulnerable (VU) category. *Naemorhedus bedfordi* (Grey Goral) and *Lutra lutra* (Common Otter) are the species listed under the Near Threatened (NT) category of IUCN (Table 6). The remaining are listed under Least Concerned (LC) category.

As per Wildlife (Protection) Act 1972, Grey Goral (*Naemorhedus bedfordi*), Common Leopard (*Panthera pardus*), Kashmir Musk Deer (*Moschus Cupreus*), and Mainland Leopard Cat (*Prionailurus bengalensis*) are the mammalian species listed as Schedule I species (Table 6).

All the avifaunal species sighted from the study area during the survey, fall under Least Concern (LC) category as per IUCN 2022-2. As per WPA (1972), all the species recorded from the area are listed as Schedule IV except House crow and Jungle crow which are listed as Schedule V species (refer to Table 7).

1.5 Protected Areas

No project component falls in any notified protected area or notified ESZs of protected area. Nearest Protected Areas from Uri-I Stage-II HE Project are Kazinag National Park, Lachipora Wildlife Sanctuary and Limber Wildlife Sanctuary. The location of all protected areas with respect to project components are shown in Figure 3. Also, no area around the project has been designated as the wildlife corridor around the project area.

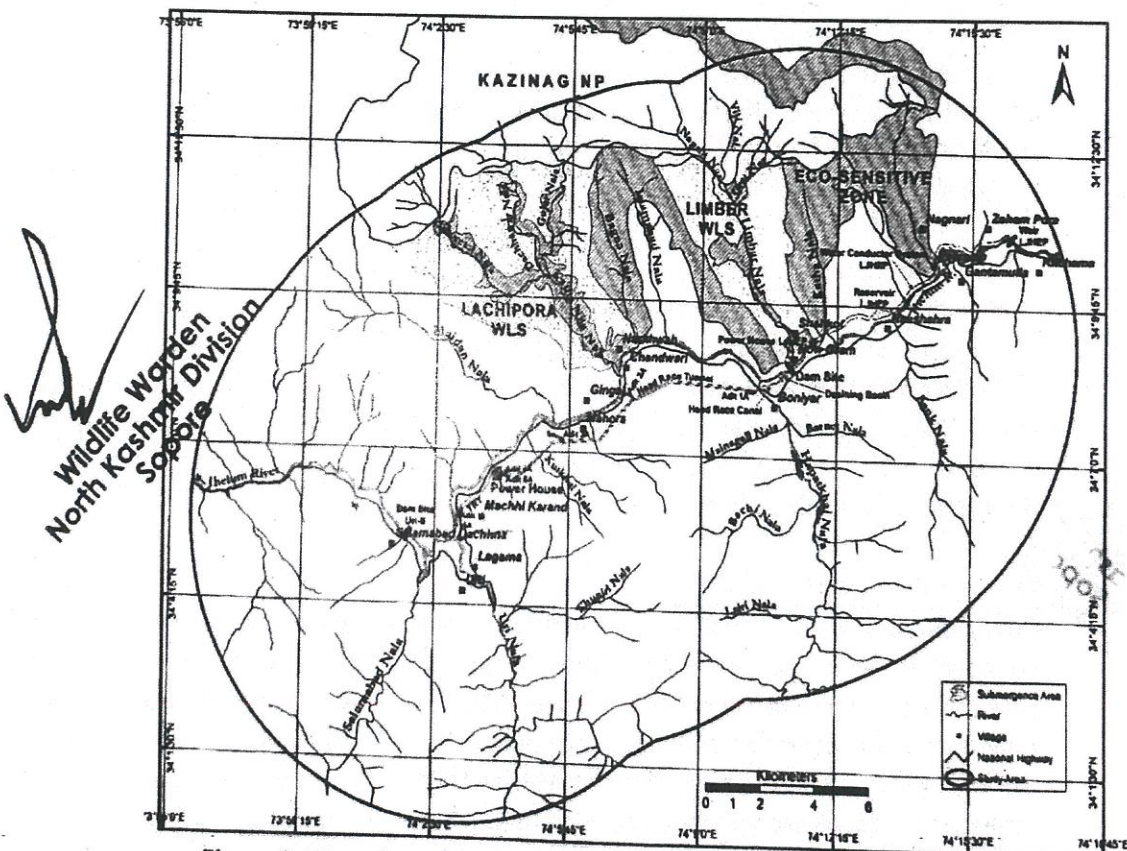


Figure 3: Map Showing distance of project components from Protected Area

1.6 Threats to Biodiversity & Wildlife

Habitat loss due to change of land use and use of heavy machinery for construction activities will affect biodiversity in the study area. Such activities might lead to increased disturbance to wildlife in the area, man-animal conflict, introduction of exotic weedy plant species into the adjacent forested area. Major threats to biodiversity and wildlife in the project area are as follows.

1.6.1 Threat Due to Project Activities

a) Project Construction Phase Impact

i) Impact of Flora

For the proposed scheme, no tree felling or clearing of vegetation cover will be undertaken. Only 17.0 ha underground forest land will be diverted for the underground construction work of the project components. Therefore, there is no impact on floral diversity and faunal diversity due to land acquisition.

The direct impact of construction activity will be limited in the vicinity of the construction sites. As mentioned earlier, a large population of 500 including technical staff, workers, and other groups of people are likely to congregate in the area during the peak project construction phase. It can be assumed that the technical staff will be of higher economic status and will live in a more urbanized habitat, and will not use wood as fuel if adequate alternate sources of fuel are provided. However, workers and other population groups residing in the area may use fuelwood, if no alternate fuel is provided. Hence, to minimize such impacts, it is proposed to provide alternate fuel for cooking e.g. LPG/ kerosene to the construction workers. The other alternative is to provide community kitchens on a cooperative basis by the contractor. The details of the same have been covered in Environmental Management Plan.

Other major impacts on the flora in and around the project area due increased level of human interference i.e. the workers may also cut trees to meet their requirements for the construction of houses, furniture, and space heating. Normally in such situations, a lot of indiscriminate use or wastage of wood is also observed, especially in remote or inaccessible areas. Thus, it is necessary to provide alternative fuel, training and awareness; and implement adequate surveillance to mitigate the adverse impacts on terrestrial flora during the project construction phase.

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ii) Disturbance to Wildlife

During the construction period, a large number of machinery and construction workers shall be mobilized, which may create disturbance to the wildlife population in the vicinity of the project area. During the EIA studies no major wildlife species has been reported from the project area. The operation of various equipment will generate significant noise; noise and vibration will also increase during blasting which will affect the fauna of the area. The noise may scare the fauna and force them to migrate to other areas, however, it will be temporary and last during the construction phase. Likewise, siting of construction plants, workshops, stores, labour camps, etc. could also lead to adverse impacts on the fauna of the area. During

the construction phase, accessibility to the area will lead to an influx of workers and the people associated with the allied activities from outside will also increase. An increase in human interference will have an impact on the terrestrial ecosystem.

The impact of blasting needs to be mitigated by adopting controlled blasting and a strict surveillance regime and the same is proposed to be used in the project. This will reduce the noise level and vibrations due to blasting to a great extent.

Forest cover in the vicinity of the proposed project work sites and their immediate vicinity is comprised of coniferous forest associated with broad-leaved forest. 23 species of mammals and 25 species of avifauna have been compiled from the study area, as discussed in the Environmental Baseline chapter. Therefore, adequate measures will be required during the construction phase not to cause any adverse impact on the terrestrial and avifaunal population.

Thus, it is necessary to formulate a conservation and management plan to mitigate the adverse impacts on terrestrial flora during the project construction phase.

b) Operation Phase Impacts

On completion of the construction of the project, the land used for construction activities will be restored. Construction workers who have resided in that area will move to another project site. By ensuring all the mitigation and management measures, as planned for this project, are implemented to minimize the impact of the construction phase, a large part of the area will return to more or less its original form. Operation phase impacts on flora and fauna will be positive due to muck disposal area, green belt development, implementation of Biodiversity Management and Wildlife Conservation Plan, etc. The increase of greenery and increased moisture due to the creation of the reservoir will have a positive impact on avifauna diversity.

1.6.2 Human Wildlife Conflict:

Deforestation, growing human settlements, expansion of agricultural land and fragmentation of natural habitat and grazing ground of species like Wild Boar are the causes of increasing of human wildlife conflict. In the study area human-wildlife conflict in terms of crop damage is perhaps more common and causes huge loss to the farmers.

1.6.3 Hunting and Poaching

Damage of crops by species like Monkey, Langur, Wild Boar, etc. and loss of livestock Common Leopard and Black Bear results as hunting and killing of these wild animals by means of setting up of trap, poisoning or with the help of hunters.

1.6.4 Illegal cutting of trees

The area is well known for Deodar (*Cedrus deodara*) forest. There is huge demand for its timber in the construction market, which increases pressure on the natural forest. Also, the stakeholders from the study area depend upon the forest for their day to day need of fodder, fuelwood, and other non-

Timber Forest products (NTFP) as well as timber wood needs. This also results in tremendous pressure on the forests.

1.6.5 Grazing Pressure

The grassland and scrub land in the area is under heavy grazing pressure by the livestock and is susceptible to damage by livestock. Also, the altitude grassland in the area provide habitat and feeding ground to ungulates and antelopes like Musk Deer, Himalayan Goral, Barking Deer, etc. The over grazing and encroachment in the area and change in land use cause degradation of wildlife habitat.

2. BIODIVERSITY MANAGEMENT AND WILDLIFE CONSERVATION PLAN

2.1 OBJECTIVES OF MANAGEMENT

Keeping in view of the anticipated Impacts as per the foregoing chapters, the management objectives can be described as:

- i. Maintenance of ecological balance through preservation and restoration, wherever it has been disturbed due to project developmental activities,
- ii. Conservation and preservation of natural habitats in project surrounding
- iii. Mitigation and control of project induced biotic and/or abiotic pressures/ influences that may affect the natural habitats,
- iv. Habitat enhancement in project area by taking up afforestation and soil conservation measures,
- v. Creating all round awareness regarding conservation and ensuring people's participation in the conservation efforts and minimizing human wildlife conflict.

2.2 MITIGATION MEASURES

The following management strategies shall be implemented by Forest/Wildlife department in and around the impact area of proposed project.

- i. Habitat Improvement of Schedule-I species through conservation and preservation of natural habitats in project surrounding
- ii. Infra-structure development
- iii. Anti-Poaching measures
- iv. Training Programme for Techniques of species rescue
- v. Prevention of Forest Fire
- vi. Human-wildlife conflict mitigation
- vii. Creating all round awareness regarding conservation and ensuring people's participation in the conservation efforts and minimizing human wildlife conflict.

2.3 CONSERVATION AND MANAGEMENT MEASURES

Wildlife conservation is the preservation and protection of animals, plants, and their habitats. The most effective way of biodiversity management and wildlife conservation in the area are habitat management through habitat enhancement, preservation and improvement, conducting conservation programmes and creation of environmental awareness involving local people, and strict enforcement of wildlife protection laws.

2.3.1 Wildlife Habitat Preservation & Improvement

i. Afforestation and Enrichment plantation

Afforestation and enrichment plantation will be carried out in the area. Area under forest and tree cover will be expanded through systematic planning and implementation of afforestation and rehabilitation programme on available community lands. Afforestation programme in the degraded Forest Compartments is also proposed to be carried out in the surrounding to the project area. The sites and species to be planted will be finalized by the State Forest Department as the program will be implemented by them.

Plantation site will be trench-fenced and brushwood fence, for the protected from cattle grazing. With the improvement in habitat of wildlife the incidences of human wildlife conflict will accordingly reduce. The estimate cost for plantation over about 25 ha degraded forest land in the surrounding of Project area has been worked @ Rs. 80,000 per ha for Enrichment plantation. The enrichment plantation will be carried in the adjoining forest area along the periphery of reservoir and intermediate area between barrage and powerhouse. As such, no additional forest land will be diverted for this purpose.

ii. Farm Forestry

The villagers for fuel and fodder to adjacent forest area. The project area harbours number of economically important plants like *Aesculus indica*, *Bauhinia variegata*, *Juglans regia* and *Pyrus pashia*, etc. These valuable resources will be directly useful to the people of the area.

With a view to reduce dependence on the natural forests for biomass and other non-timber forest products (NTFPs) or minor forest produce (MFP) alternate resources need to be building up. NTFPs/MFP plantations will be carried out on the community land, degraded land, fallow lands which help in sustainable land management and also a tool for reclamation.

Under this scheme Seedlings will be distributed every year to villagers on a nominal rate. Villages in the surrounding of project area has been given preference. The distribution will be facilitated through Forest Range office in the area. Forest department may take up prior seeds with the help of local administrative bodies/panchayats to assess the requirement plants.

A budgetary estimate of Rs. 5.00 lakh has been made for development of farm forestry in the project area.

2.3.2 Development of Pastureland

As there are degraded patches of pasture in the area, this measure will be adopted to encourage development of new and healthy pastures for use of cattle of the area. Barren land with greater slopes has been recommended to be treated by developing pastures over them. Under this treatment, suitable species of grasses and leguminous plant species be planted in the land area earmarked for the purpose. A provision of Rs. 12,00,000/- (@ Rs. 60,000/ha) for development of pastureland over 20 ha degraded scrubland and grassland has been kept under this plan.

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2.3.3 Awareness Programme

The success of any conservation plan of this magnitude is entirely hinged on the active support and wholehearted co-operation of all stakeholders with the members of public playing a major role. For this purpose, meetings and workshops will be organized from village to village on regular basis. Functions like Van Mahotsav, Wildlife Week, World Forestry Day, and World Environment Day will be organized in a befitting manner to which village heads, members of public representatives' system at Gram Panchayat level, local leaders and members of NGO will be involved. The topics should include deterioration of biodiversity, habitat loss, control of Blue Bull and Wild Boar damages and other human wildlife conflicts, fire damage control and how best the vegetation can be revamped etc. Members of public will be encouraged to speak. Student community should also be sensitized on various conservation issues.

Considering that the wildlife populations will be impacted by project construction activities and also due to influx of migrant labour force, mitigation measures should also be taken for the larger area. The following measures are proposed:

- Control on poaching.
- Awareness campaigns aimed at creating awareness towards respecting the habitat protection in general and the protection of wildlife species in particular.

Under this programme, various activities viz. training, publishing of pamphlets, brochures, hoardings, etc. shall be carried out during the construction phase of the project. The following activities are planned under this programme:

Observance of Wildlife Week: The wildlife week will be celebrated every year in the month of October to assess all the tasks set aside for wildlife management. Under this programme, seminars, art competitions and awareness campaigns will be held.

Nature Club: Nature clubs will be introduced at Higher secondary and High school level in the project area. They will be imparted education by means of audio-visual aids so as to sensitize them about importance of wildlife conservation.

Involvement of Village Panchayats and NGOs: The Panchayats of affected villages and active NGOs in the project area would be involved to disseminate the knowledge about the benefits of the proposed project and ensuring greater participation in the conservation efforts and safeguard the environment of the area.

For implementation of awareness programme an amount of Rs. 1.00 lakh/year for four year has been budgeted.

2.3.4 Strengthening of Infrastructural Facilities of Forest/Wildlife Department

Under this plan Project authority would assist the State Forest and Wildlife Departments in strengthening the infrastructure facilities, which are poorly developed in the area. Various activities which are necessary for the forest protection plan are described in the following paragraphs.

- For improvement of vigilance and measures to check poaching, check posts and watch towers will be needed. In order to strengthen the working capacity, the workforce of the

State Forest/Wildlife Department they must be provided with necessary equipment such as a camera, wireless, binoculars GPS, search lights, health kits, wildlife rescue vans, rescue cages etc. that would increase their capability and efficiency of monitoring.

- ii) The construction of inspection paths and watch towers for more effective and meaningful patrolling by the department.
- iv) Creation of veterinary facilities and rescue centers for healthcare of wild animals and for disease control. For this purpose, it is essential to maintain a stock of medicines in addition to setting up of a *mobile-rescue-cum-rehabilitation-van*.

Project authorities would provide funds to the State Forest/Wildlife Department. Total financial outlay under this head would be Rs. 50.00 lakh.

2.3.5 Budget

Total budget for the Biodiversity Management & Wildlife Conservation Plan would be Rs. 95.00 lakh. The breakup of the budget is given at Table 9 below.

Table 9: Budget for Biodiversity Management & Wildlife Conservation Plan

S. No.	Particulars	Implementing Deptt.	Total Amount (Rs. in Lakh)
1	Afforestation and Enrichment along the adjoining forest area (@Rs. 80,000/ha for 25 ha)	Forest	20.00
2	Farm forestry for fuelwood and timber	Forest	5.00
3	Development of Pastureland	Forest	12.00
5	Awareness Programme @ Rs. 1 lakh/year for 4 years	Forest/Wildlife	8.00
6	Strengthening of Infrastructural Facilities of Forest/Wildlife Department	Forest/Wildlife	50.00
	Total		95.00

3. CONSERVATION AND MANAGEMENT OF SCHEDULE-I SPECIES

3.1 Introduction

The development activities often present a threat to biodiversity in the area like habitat destruction, degradation, fragmentation through overexploitation, poaching, hunting, pollution, etc. Therefore, developmental projects are required to maintain ecological integrity to ensure biodiversity conservation and sustainable development together. The impacts need be mitigated or minimized substantially through well drafted conservation management plan. The Indian Wildlife (Protection) Act, 1972 mandates protection of plants and animal species by way of listing them under different schedules to provide them varying degrees of protection. Schedule I and part II of Schedule II provide absolute protection and offences under these are prescribed the highest penalties. Key strategies required for any biodiversity management plan are *in situ* strategy, *ex situ* strategy, reduction of anthropogenic pressure and rehabilitation of endangered species.

3.2 Biodiversity in the Study Area

The details of biodiversity in the study area have already given in section 1.4. According to it Common Leopard (*Panthera pardus*), Kashmir Musk Deer (*Moschus Cupreus*), Grey Goral (*Naemorhedus bedfordi*) and Mainland Leopard Cat (*Prionailurus bengalensis*) are the Schedule-I species as per Indian Wildlife (Protection) Act, 1972 reported from the study area.

3.3 Conversation Measures for Schedule-I Species

3.3.1 Leopard (*Panthera pardus*)

Apart from Asiatic lion, Bengal tiger, Snow leopard and Clouded leopard, the Indian Leopard (*Panthera pardus*) is one of the big cats found in India. The Indian Leopard (*Panthera pardus*) is widely distributed in the Indian subcontinent. They inhabit tropical rain forests, dry deciduous forests, temperate forests, and northern coniferous forests.

3.3.1.1 Conservation Status

The leopard is classified as Vulnerable (VU) on the IUCN Red List of Threatened Species Ver. 2022-2 (<https://www.iucnredlist.org/species/15954/163991139>). *Panthera pardus* is listed in CITES Appendix I.

3.3.1.2 Threats

- a. **Habitat Threats:** Loss of natural habitat is a major threat to leopard. Habitat fragmentation reduced prey base and conflict with livestock have reduced Leopard populations throughout most of their range (<https://www.iucnredlist.org/species/15954/163991139>). Habitat degradation outside the protected area, caused by overgrazing, overharvest of forest products, expansion of agricultural areas, and mining of minerals also possess threats to the habitat of species.
- b. **Human - Leopard Conflicts:** Many wildlife biologists have studied the human leopard conflict in India like Athreya et. al. (2007), Chellam (2010), Aggarwal et. al. (2011), Mathur (2014), Chauksey et. al. (2017), Kshetry et. al. (2017), Naha et. al. (2018), and Athreya et. al. (2020). These studies have listed number of factors responsible these conflicts. Some of them are the expansion of agriculturally used land, encroachment of humans and their livestock into protected areas are main factors contributing to habitat loss and decrease of wild prey. As a result, Leopard's approach human settlements, where they are tempted to prey on domestic livestock like cattle, dogs, and goats, which constitutes an important part of their diet, if they live on the periphery of human habitations. Human-leopard conflict situations ensue and have increased in recent years. In retaliation for attacks on livestock, leopards are shot, poisoned, and trapped in brutal snares. Leopard-human conflict is a serious problem in India and the subcontinent and is another cause of significant mortality of Leopards. India's Forest Department is entitled to set up traps only in cases of a leopard having attacked humans. According to Chellam (2010) several cases of leopard attack have been reported in Maharashtra and Madhya Pradesh and human leopard conflict is a well-known problem in and around protected as well as unprotected areas in India (Chauksey et al., 2017).
- c. **Poaching:** A significant immediate threat to wild leopard populations is the illegal trade in poached skins and body parts. Illegal trade in Leopard body parts (skin, bones, and claws) continues to threaten the survival of the species in the wild.

3.3.2 Mainland Leopard Cat (*Prionailurus bengalensis*)

The Mainland Leopard Cat (*Prionailurus bengalensis*) is amongst the smallest of Southeast Asia's wild cats. This species is highly adaptable, occurring in a wide range of habitats including various types of primary forest, secondary habitats including cultivated areas, and

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plantations. Its diet is highly varied and includes large insects, and small vertebrates such as lizards and reportedly amphibians.

3.3.2.1 Conservation Status

The Mainland Leopard Cat is classified as Least Concern (LC) by IUCN Red List of Threatened Species Ver. 2022-2 (<https://www.iucnredlist.org/species/223138747/223178117>) and listed under Appendix II of CITES.

3.3.2.2 Threats

Deforestation is potentially an important driver of habitat deterioration and may be a localised threat to Mainland Leopard Cat survival in certain areas. Other potential threats to Mainland Leopard Cat vary across its geographic range are hunting and snaring occur in most parts of Mainland Leopard Cat's range and is particularly intense in South-east Asia (Gray et al. 2018, Harrison et al. 2016, Willcox et al. 2014).

Misidentifications (as, for example mistaking the species as Leopard *Panthera pardus* or Fishing Cat leading to lethal anthropogenic responses are common in countries like India, Bangladesh and Nepal. These perspectives instil fear, resulting in stern retaliatory anthropogenic responses. Road kills in and around forests is another visible potential issue for the Mainland Leopard Cat in some areas.

3.3.3 Kashmir Musk Deer (*Moschus Cupreus*)

The Kashmir Musk Deer (*Moschus Cupreus*) distribution is limited to Jammu & Kashmir Himalayas, as the animal is endemic to the region. This species inhabits oak and conifer and subalpine scrub 1500 to 4000m, more commonly between 2000 to 3100 m.

3.3.3.1 Conservation Status

The Kashmir Musk Deer (*Moschus cupreus*) is listed as Endangered (EN) on the IUCN Red List of Threatened Species Ver. 2022-2 (<https://www.iucnredlist.org/species/13901/6977764#habitat-ecology>) and listed in Appendix I of CITES.

3.3.3.2 Threats

Population growth has forced the people of Himalayan region to exploit forest resource to fulfill their forest basic needs such as fuel wood, timber, fodder. Unsustainable harvesting practices in the Himalayan region have led to the subalpine and alpine vegetation in degradable condition (Echolm, 1975). These activities have urged the degradation of wildlife habitat which ultimately contribute in the reduction of musk deer population. In addition, owing to socio-economic and political conditions, musk deer population aren't being afforded safe

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sanctuary even in remote areas because of poaching and hunting for their live hood subsistence (Jackson, 1979).

Habitat destruction, due to increasing human and livestock populations limited the distribution of musk deer to smaller and fragmented area. As result, the population of musk deer has reduced considerably. The habitats of musk deer in the subalpine region of the Himalayas are increasingly used for harvesting firewood and as pasture land. Besides, this causes the loss of the under-story of vegetation which is of particular importance to musk deer for food and shelter against predators. In addition, fire and other anthropogenic activities also altered the potential musk deer habitat into vulnerable condition.

Musk deer is killed for the collection of natural musk which is found in the musk gland of mature males near the umbilicus. During illegal killing for every mature male, 4 – 5 females and juveniles are killed which have no musk or very small amount of musk. This activity results in the rapid decline of population of musk deer.

3.3.4 Management and Conservation Measures

a. *Panthera pardus* (Leopard) & *Prionailurus bengalensis* (The Mainland Leopard Cat)

Habitat improvement: Leopards live in a variety of dry and wet forests, and in some grasslands, where boulders and scattered shrubs and trees provide shelter. The Leopard has the widest habitat tolerance than any big cat in India. Habitat of the species will be improved by planting suitable species in surrounding areas. The prey species preferred by leopard will be conserved to ensure sufficient prey availability, which will also reduce the conflict with humans. The prey species preferred by leopard will be conserved to ensure sufficient prey availability which will also reduce the conflicts with humans.

In addition to conservation of Bear habitat, restoration of habitat through community-based forestry activities need to be implemented. Community-based forestry programs could significantly expand habitat for sloth bears. The benefits of this community-based approach to maintaining ecosystem integrity thus extends well beyond sloth Bear.

Plantation of fruit bearing species: Conflicts generally arise when leopard or black Bear lives in human settlements, which indirectly reflect the condition of adjacent forested areas, i.e. its ability to support Leopard and Bear habitat. Plantation of fruit bearing tree species in the forest fringes is a long-term measure by which food is made available to the bears inside the forests, so that they are not compelled to enter the orchards and come in conflict with humans.

Strict Protection Measures: The Wildlife (Protection) Act of 1972 provides us with the statutory framework for wildlife conservation, and Poaching is a crime against wildlife. During interview and discussion with local people it was noted that study area is not prone to poaching or any other wildlife violence related to leopard. But precaution will be always taken while dealing with wildlife. The contact information of concern wildlife and forest department will be provided to every worker or at the field office. If any kind of poaching or other offense is noticed; it will be immediately clued-up to the concern Forest and Wildlife Officials. More importantly, worker will make aware of wildlife crime and subsequent penalties and punishment.

b. Kashmir Musk Deer (*Moschus cupreus*)

- I. Habitat Conservation by initiation of landscape conservation
- II. Controlled and restrict the grazing on area identified as Musk Deer feeding ground.
- III. Strengthening of patrolling to restrict hunting and poaching
- IV. Control excessive exploitation of forest resource collection.
- V. Awareness among the society about the ecological importance of Himalayan Musk Deer.

c. Public Awareness Programme

Involvement of local people in conservation activities will be ensured by organizing meetings and seminars from village to village on regular basis to carry the people along with implementation. The support of village heads and other members of gram panchayat, local leaders and members of regional NGO would be solicited to execute the proposed awareness and habitat improvement programmes. Functions like wildlife week, world forestry day, Van Mahotsav and world environment day will be organized. The discussion may evolve around habitat loss, human-wildlife conflicts and how best the vegetation can be revamped etc.

Moreover, a training workshop for all workers will be conducted in starting of any project. It will include the formal training on the importance of biodiversity and to make available the information of the flora and fauna of high conservation value present in the area. Information on Wildlife policies and Government regulation and penalties will be provided to workers. Similar kinds of activities will be done from time to time to enhance the interest of villagers and workers in the conservation.

3.4 Management Measures

In view of the above, various Management and Conservation measures like Habitat improvement, development of Biological Fences using suitable plant species, enforcement of Strict Protection Measures, Public Awareness Programme involving villagers and wildlife officials for protection and conservation of various species, Anti-Poaching measures, Construction and filling of water holes and check dams/Ponds, tube wells etc, Support/Provision of veterinary care, cages, rescue centers, etc., Infra-structure development (Surveillance Equipment's like Cameras, Wireless Sets, GPS etc), Training Programme for Rescue Techniques of faunal species, Prevention of Forest Fire activities like training and Infrastructure facilities etc., have been proposed.

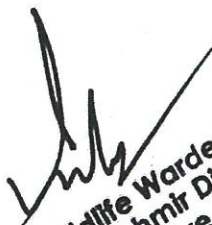
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Tackling of human-wildlife conflict & Veterinary care

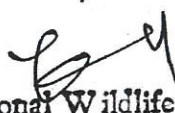
The following provision has been made to ensure that the human-wildlife conflict is reduced significantly and to ensure that proper veterinary care is given to the rescued animals before rehabilitation.

- i. Strengthening of veterinary facilities and rescue centers, treatment and transport cages etc. for healthcare of wild animals and for disease control.
- ii. Setting up of wildlife control rooms with quick response teams (QRTs) to attend to the human-wildlife conflict situations promptly.
- iii. Provision for procurement of equipment like tranquillizing guns, drugs and accessories.
- iv. Provision of 02 mobile-rescue-cum-rehabilitation-vans with financial provision of Rs. 30.00lakh.

- v. For Maintenance of mobile-rescue-cum-rehabilitation-van and medical supplies provision of R. 5.00 lakh/ year for 4 years has been proposed under this plan.


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Training programme shall be organised for upgradation of knowledge and techniques of faunal species rescue and veterinary care. A total budget of Rs. 7.00 has been proposed for training programme.

3.4.2 Prevention of Forest Fire

The deciduous vegetation and pastureland in the area are prone to fire. Forest fire is caused both naturally as well as by the human beings. Anthropogenic causes will be minimized through forming a fire line around the forest area. The following measures are therefore proposed to be taken to prevent forest fire:

- i. **Fire Fighting Equipments:** These Fire watchers will also be equipped with certain Fire Fighting Equipments such as Fire resistance dress, Water bottle, Axe, Shoes etc. to attend to emergencies. Therefore, financial provision has been made for fire-fighting equipments.
- ii. **Clearing of Fire Line:** Fireline will be cleared over a vulnerable area.
- iii. **Training & Awareness:** Financial provision to organize firefighting training for forest officials and villagers residing around project area has been made under this Plan.

3.4.3 Maintenance of Drinking Water Sources in Wildlife Habitat

To avoid interference with human habitation it is necessary to maintain the drinking water sources of wildlife in their habitat. For easy accessibility of drinking water for wildlife within the wildlife protected area provision of maintenance of natural drinking water sources has been made. Fund has been allocated for maintenance of existing springs, waterholes/ ponds in the area. A total of Rs. 10.00 lakh has been allocated under this scheme.

3.4.4 Training to Volunteers/ Local Youth

In addition to activities like management and conservation of habitat and provision of veterinary care for faunal species in the area, training programme has been organized regarding the rescue techniques of faunal species for interested volunteers/ local youth, Government officials other than forest department by State Forest Department with the help of recognized organizations, wildlife professionals and NGO's. A lump sum budget of Rs. 6.00 lakh has been kept for Wildlife rescue training to volunteers.

3.4.5 Safeguards during construction phase

During the construction phase, various adverse impacts on the forest and wildlife are anticipated in the surrounding areas of the proposed project in terms of increased noise levels, release of air and water pollutants, etc. To avoid and minimize the negative impacts of these activities, project authorities are advised to prepare strict guidelines as suggested below:

- (i) Minimum levels of noise during construction activities will be maintained and ambient noise should be monitored periodically at different locations as outlined in Environment Monitoring Program.
- (ii) Strict restrictions shall be imposed on the workers at project sites to ensure that they do not harvest any species/produce from the forests and cause any danger or harm to the animals and birds in the wild.

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- (iii) The provision made for community kitchen and ensure the supply of the kitchen fuel from the nearest depots to avoid forest degradation and destruction of forest and wildlife habitats.
- (iv) The interference of human population would be kept to a minimum in the adjacent forested areas and it would be ensured that the contractors do not set up labour colonies in the vicinity of forests and wilderness areas.

3.5 Budgetary Provisions

The total budget allocated focusing on Conservation plan for Schedule -I species is Rs 74.00 lakh, under Biodiversity Conservation and Wildlife Management Plan of Uri-I Stage-II HEP. The Break-up of the budget is given in Table 10.

**Table 10: Break-up for Wildlife Management and Conservation Plan for Schedule I Species
(To be implemented by Wildlife Department)**

S. No.	Activity	Fund Allocated (Rs in Lakh)
1	Habitat Improvement by development of vegetation cover by plantation with fruit bearing species.	0.0*
3	Tackling human-wildlife conflict and support/provision for veterinary care, wildlife control rooms, vehicles for staff mobility, cages, recuse centers, etc.	57.00
4	Prevention of Forest Fire: Training and Infrastructure facilities	10.00
5	Protection and maintenance of natural drinking water sources in wildlife habitat.	10.00
6	Training Programme for Techniques of faunal species rescue	5.00
7	Anti-Poaching and anti-smuggling measures	5.00
8	Infra-structure development (Surveillance Equipment's (like Cameras, Wireless Sets, GPS, binoculars, night vision, drones etc.).	0.0*
	Total	87.00

*Covered under Biodiversity Management & Wildlife Conservation Plan (refer table 7)

4. MONITORING AND EVALUATION

The monitoring and evaluation of Biodiversity Conservation and Wildlife Management Plan of Uri-I Stage-II HEP will be carried out by a Biodiversity Management Committee (BMC). The committee will follow the guidelines of National Biodiversity Authority, State Biodiversity Conservation Strategy Action Plans (SBCSAP) and State Forest Department to implement, monitor and evaluate the Biodiversity Conservation and Wildlife Management Plan of the proposed Project. The activities of BMC shall be under the direct administrative control of the Chief Wildlife Warden/Principal Chief Conservator of Forests, Jammu and Kashmir State Forest Department. The BMC will comprise of the following members:

Chief Wildlife Warden/Principal Chief Conservator of Forests, Jammu & Kashmir	Chairman
Manager (Environment), NHPC. Ltd.	Member Secretary
Divisional Forest Officer of the concerned Division	Member
Experts form State University and Active NGO's	Member
Local Body's Representatives from the villages	Member

The Chairman of the committee will have the right to assign various activities to various members for proper functioning and result-oriented tasks. The committee will monitor the progress of the proposed plan. Total financial outlay for the BMC would be Rs. 4.00 lakh only.

5. LOCATIONS OF PROPOSED INTERVENTION

The proposed intervention shall be implemented by State Forest and Wildlife Departments as indicated in the Tables & 10. Hence the selection of site for implementation of proposed measures will be finalized by state Forest & Wildlife Departments.


6. FINANCIAL PROVISION

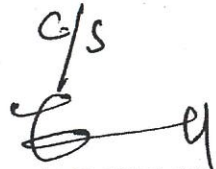
The total budget allocated focusing on Biodiversity and Wildlife Conservation and Management Plan including conservation and management measures for Schedule-I species is Rs 186.00 lakh. The Break-up of the budget is given in Table 11.

State Forest & Wildlife Departments shall be the executing agency for implementation of the proposed mitigation measures under Biodiversity Conservation and Wildlife Management Plan in the surrounding forest and wildlife protected areas of proposed project site, therefore, a total amount of Rs. 186.00 lakh will be deposited with the State Forest/Wildlife Department for taking up proposed activities within the area.

Table 11: Total Cost of Biodiversity Management and Wildlife Conservation Plan

S. No.	Activity	Fund Allocated (Rs in Lakh)
1	Biodiversity Conservation and Wildlife Management Plan	95.00
2	Conservation & Management of Schedule-I Species	87.00
3	Monitoring And Evaluation	4.00
	Total	186.00


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