Operational Guidelines for Management and Monitoring of High Conservation Value

Department of Forests and Park Services
Ministry of Energy and Natural Resources
Royal Government of Bhutan
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High Value Conservation Operation Guidelines prepared to Bhutanese context by:

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Abbreviation

CFO : Chief Forestry Officer
CMP : Conservation Measures Partnership
CS : Conservation Standards
DFO : Divisional Forest Offices
DoFPS : Department of Forests and Park Services
FIRMS : Forest Information Reporting and Monitoring System
FMID : Forest Monitoring and Information Division
FRPMD : Forest Resource Planning and Management Division
HCV : High Conservation Value
HCVA : High Conservation Value Area
HCVMA : High Conservation Value Management Area
HCVN : High Conservation Value Network
HCVRN : High Conservation Value Resource Network
KBA : Key Biodiversity Areas
NCD : Nature Conservation Division
NI : National Interpretation
OEMCA : Other Effective Management Conservation Area
SA : Strategic Approaches
UWIFoRT : Ugyen Wangchuck Institute for Forestry Research and Training
WWF : World Wildlife Fund

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Lastly, our deep appreciation also goes to the International Climate Initiative (IKI), the Federal Government of Germany and WWF Bhutan for the financial and technical support, which has been instrumental in propelling this initiative forward.

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ROYAL GOVERNMENT OF BHUTAN
MINISTRY OF ENERGY AND NATURAL RESOURCES
DEPARTMENT OF FORESTS AND PARK SERVICES

DIRECTOR

FOREWOD

Safeguarding Bhutan's rich biodiversity and ecological balance remains central to our national vision. As the nation strive to harmonize development and biodiversity conservation, there is a growing need for effective tools that can guide and support informed decision-making. Among these, the identification and management of High Conservation Value (HCV) areas, which hold exceptional ecological, social, and cultural importance require a careful and structured approach.

This operational guideline for HCV management and monitoring represents a significant stride in Bhutan's journey towards sustainable and inclusive forest governance. It is the product of collective expertise drawn from forestry professionals, conservation partners, and technical specialists, who collaborated to shape a practical, forward-thinking framework.

Within the IKI Living Landscape, covering 14,605 square kilometers, the Department of Forests and Park Services (DoFPS) has designated 275 square kilometers, approximately 2% of the total Living Landscape area as HCV management areas. These areas will be strategically managed to address emerging conservation threats. Moreover, the guideline offers a replicable model that can support the identification and management of additional HCV sites in other regions of the country.

The framework is designed to standardize procedures, strengthen on-the-ground monitoring, and promote adaptive management tailored to the unique conditions of Bhutan's landscapes. Through its implementation, the DoFPS reaffirm its enduring commitment to conserving the nation's natural treasures for the well-being of current and future generations.

We gratefully acknowledge the contributions of all stakeholders and partners whose dedication made this publication possible. We hope it will serve as a living document continually refined through experience, knowledge sharing, and collective stewardship.

Tashi Delek!

DIRECTOR
Department of Forests and park Services

1. Background

High Conservation Values (HCVs) refer to *"biological, ecological, social, or cultural values of outstanding significance or critical importance. These values are identified within natural habitats and need to be managed appropriately to maintain or enhance their identified values*" (HCV Resource Network, 2013). HCV and Key Biodiversity Areas (KBA) are examples of "*other effective conservation area*" defined under the Forest and Nature Conservation Act of Bhutan (FNCA) 2023 and Forest and Nature Conservation Rules and Regulations of Bhutan (FNCR) 2023 and important for the in-situ conservation of biodiversity, with associated ecosystem functions and services.

The global importance of High Conservation Values (HCVs) lies in their contribution to conserving biodiversity, maintaining ecosystem services, and protecting cultural heritage. HCVs play a vital role in promoting sustainable development by ensuring that areas of exceptional environmental, social, or cultural significance are recognized and safeguarded. They are widely applied in conservation strategies, sustainability certification systems like the Roundtable on Sustainable Palm Oil (RSPO), and in corporate no-deforestation policies.

HCVs hold particular importance in Bhutan, reflecting the nation's deep-rooted commitment to environmental preservation and sustainable development. With assistance from WWF-Bhutan, the country has formulated its own National Interpretation of HCVs, providing context-specific guidance that aligns with Bhutan's unique ecological and cultural setting. These initiatives are closely tied to Bhutan's overarching environmental vision, which is shaped by the philosophy of Gross National Happiness and the constitutional requirement to maintain at least 60% forest cover across the country for all time, seeking harmonious balance between development and conservation.

HCVs integrate smoothly into Bhutan's existing policies and regulations, reinforcing conservation legislation, promoting biodiversity, and protecting ecosystem services critical to communities. These efforts align with Bhutan's commitments to carbon neutrality and climate resilience, reflecting the country's broader environmental priorities.

The HCVs in Bhutan has progressed through several important milestones, notably the development of the National Interpretation for HCVs in 2022. This achievement was the result of thorough stakeholder engagement and expert contributions, producing a detailed framework for identifying and managing HCVs in line with international, national, and local regulations. Building on this, nine HCV sites were identified across Bhutan through a combination of desktop analysis and field verification, and corresponding HCV management plans were developed in collaboration with relevant stakeholders from 2003 onwards.

2. Scope and Purpose

The Operation Guidelines for management and monitoring of HCV area in Bhutan is designed to provide a structured approach to identifying, managing, and monitoring areas of exceptional environmental, social, and cultural significance. Tailored to Bhutan's unique ecological and cultural landscape, this document serves as a practical tool for stakeholders involved in conservation and land-use planning. Its objectives include ensuring compliance with international and national conservation standards, strengthening biodiversity protection,

and supporting Bhutan's broader environmental commitments, such as Gross National Happiness and the constitutional mandate of maintaining 60% forest cover in perpetuity.

This guideline developed based on the experience gained from identifying High Conservation Value (HCV) sites and preparing HCV management plans for nine Divisional Forest Management Plans under the IKI Living Landscape project. Nevertheless, these guidelines can be applied to HCV management efforts across any part of Bhutan.

The intended use of the guideline is to:

- Identify HCVs based on Bhutan's National Interpretation.
- Provide a clear framework for sustainable land-use planning and management.
- Integrate HCV principles into decision-making processes for development and conservation projects.

The guideline outlines detailed steps for effective management of HCV:

1. **HCV Identification:**

- Conduct assessments to identify areas with High Conservation Values, focusing on biodiversity, ecosystem services, and cultural importance.
- Engage with local communities and stakeholders to gather valuable insights and data.

2. **HCV Management:**

- Develop management plans tailored to maintaining or enhancing the identified HCVs.
- Ensure that plans are aligned with Bhutan's environmental and development policies.

3. **HCV Monitoring:**

- Implement systems to regularly monitor the condition of HCV areas and assess the effectiveness of management strategies.
- Adapt and refine management approaches based on monitoring outcomes.

3. HCV Screening Process

HCV screening is a desktop exercise utilising six globally applicable HCV definitions. In Bhutan, this process has been adapted to identify potential HCVs within the landscapes, specifically across nine Divisional Forest Offices (DFOs). The screening aims to determine areas that require targeted follow-up actions on locations where HCVs face various threats and align with the screening objectives. Generally, HCV screening is a high-level, large-scale process, conducted through desktop work and complemented by stakeholder consultations and field validation.

The screening process, developed by the HCV Resource Network (HCVRN), involve desktop analysis using the National Interpretation (NI) alongside the HCV Screening Open Standards for the Practice of Conservation (Conservation Standards (CS)) to guide the identification of HCVs.

The standards of the open-source Conservation Measures Partnership (CMP) offer a clear, systematic approach for managing, monitoring, and planning to address complex and urgent environmental issues. The CS aids in designing actions for the effective management of high-Priority High Conservation Value Areas (HCVAs). A workshop held in Thimphu from April 24th to 28th, 2023, documented suitable monitoring practices and threat prevention measures for HCVAs. Recommendations were also made for potential management and monitoring in Priority III and IV areas identified during the HCV screening.

Figure 1: Stages of screening HCV

The HCVRN toolkit outlines six key steps (Figure 1) in the screening process, which are used to identify and prioritise areas with significant conservation value. This process aims to enhance biodiversity conservation, safeguard ecosystems and promote community well-being. The screening process was supported by global HCVN specialists, in consultation with the Department of Forests and Park Services (DoFPS), participated by IKI Task Force members and field focal points. The process identifies critical conservation values that necessitate further detailed assessment and management to ensure conservation of the value present in the area.

a. Define Purpose and Scope:

To identify HCVs, spatial analysis for IKI living landscapes defines the geographic scope. Landscape-level screening is categorised into Priority I - IV (Figure 2) wherein DFOs identified HCV areas in Priority I, II or both (Figure 3).

b. Gather Information for Analysis

Before screening, a data gap analysis was conducted. Primary and secondary data were sourced from national surveys (Tiger, Snow Leopard, National Forest Inventory), jurisdictional studies, wildlife observational SMART data for species diversity and

distribution analysis validated through the data from the Forest Information Reporting and Monitoring System (FIRMS). Threat analysis utilised SMART data and national/DFO level studies to assess landscapes threats.

c. Determine Likelihood of HCV Presence

The probability of HCVs was assessed within the landscape using spatial analysis of critical species. This involved overlaying all species identified by the DoFPS, including both Task Force and DFOs as part of the screening process.

d. Determine Likelihood of Threats to HCVs

HCVs within the landscapes were assessed using spatial analysis of critical species. This involved overlaying of species data identified by DoFPS, including those from Task force and DFOs as a part of the screening process.

e. Identify Priorities in the Landscape

The final HCV sites in the landscapes were mapped by spatially overlaying species presence and threats. Post national/landscape screening results were shared with DFOs to identify and prioritise HCVs (Priority I or II) and design management interventions, informed by stakeholder consultations to mitigate threats.

f. Present Results

The outcome of the screening process and engaging with stakeholders necessitates effective communication with decision-makers and relevant organisations. The DFO should utilise these results to guide land-use planning, conservation strategies, and management actions.

4. Prioritisation and Finalization of HCV management areas

Following the national level screening deliberated above, the landscape level screening dataset was shared with DFOs for field verification, stakeholder consultation, prioritisation and finalisation of HCVMA. The finalised HCVMA for IKI landscape are in Table 1.

Table 1: Finalized HCVMA for IKI Living Landscape

DFO Name	HCV name	HCV Category selected	Area (Ha)	HCV Priority
DFO Dagana	Namchella catchment area	HCV 4	43.94.	1
DFO Gedu	Tumdra Ney: The Sacred Haven of Cultural Heritage	HCV 6	206.4	2
DFO Paro	Taktshang-Bumdrak-Dragay Pangtsho	HCV6	7218.1	2
DFO Thimphu	Dagala Water Catchment Area	HCV 4	2220.9	1
DFO Tsirang	Darachu-Norjangsa Cloud Zone Forest.	HCV 3	2330.6	2
DFO Samtse	Nub Dalemkha Landscape Conservation	HCV 2	8256.3	1
DFO Sarpang	Chhdzom-Pristine Mountain Forest Ecosystems	HCV 2	4493.6	2
DFO Zhemgang	Buli Tsho- (Eco-spiritual significance of Buli-tsho)	HCV 6	15.8	1
JKSNR	Tergola Red Panda conservation area	HCV 1	2722.8	1
	Total Area		**27508.4**	

4.1.Selecting HCV Management Areas (HCVMA)

The HCV screening has demonstrated that HCV occurs almost throughout the IKI landscape, within most types of forest and non-forest ecosystems (Figure 2). HCV Management Areas (HCVMA) must be selected within a wider landscape based on the number of considerations using the HCV screening summary map as a guide.

- The HCVMA should focus on Priority 1 and Priority 2 areas as these are areas where there is a high probability of HCV presence.
- HCVMA selected do not need to be contiguous and there is no minimum size required. However, DFOs should select the largest area possible based on the capacity to manage these areas, with the understanding that HCV are generally not restricted to small discrete

areas and can occur throughout production forests, community forests and are also connected to Protected Areas.

- HCVMA should consider neighbouring DFO's HCVMA as well as Protected Areas to achieve holistic and effective conservation of HCVs.
- It is acceptable in this forest landscape if "*HCV Management Areas*" are selected within timber production areas, contain community forests or other resource use zones as long as appropriate management is practised[1].
- By using the same base maps, DFOs will be able to create coordinated and complementary HCV management plans between DFOs jurisdictions. This will potentially avoid gaps in HCV management that may impact overall survival of species, provision of ecosystem services of community and cultural values in the landscape.

Box 1: 1A

- ✓ Use the Summary Map to identify and select candidate HCV Management areas focusing on Priority 1 areas
- ✓ Consider DFO capacity for management and expand selected area to Priority 2 areas (if possible),
- ✓ Refine selected HCVMA with consideration of neighbouring DFO HCVMA and or Protected Areas to achieve contiguous HCV managed area.

(Output: Spatially explicit candidate areas for HCV Management centred on Priority 1 and 2 Areas)

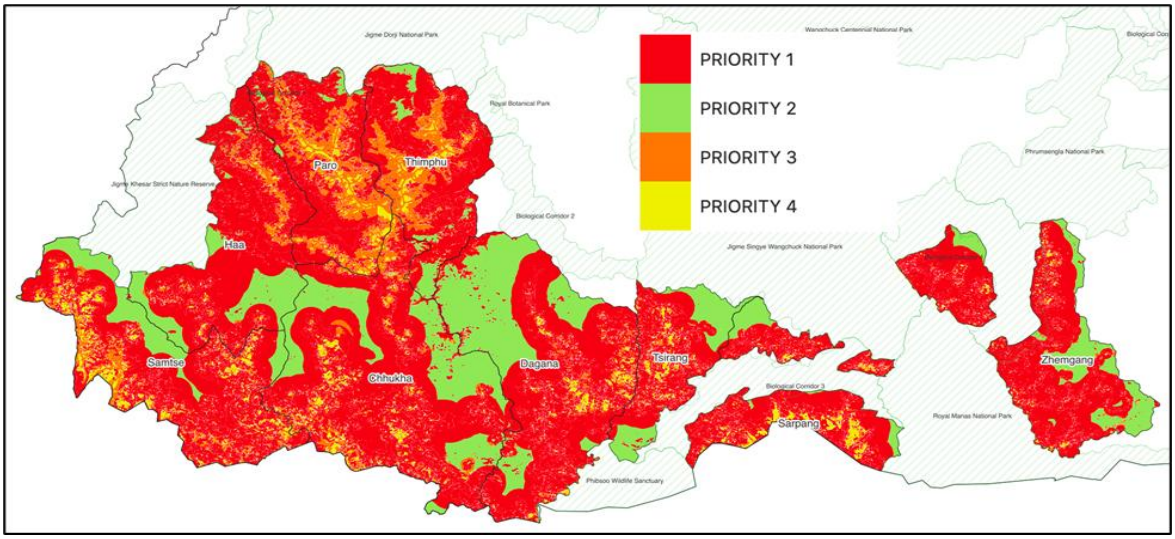


Figure 2: HCV screening summary map of all Priority areas in the landscape

[1] This is very different to a "conversion scenario" where a change in land use (such as conversion of a forest to agriculture or infrastructure development) would negatively impact HCVs, and therefore usually require HCV 'set asides' to maintain and enhance HCVs in these scenarios.

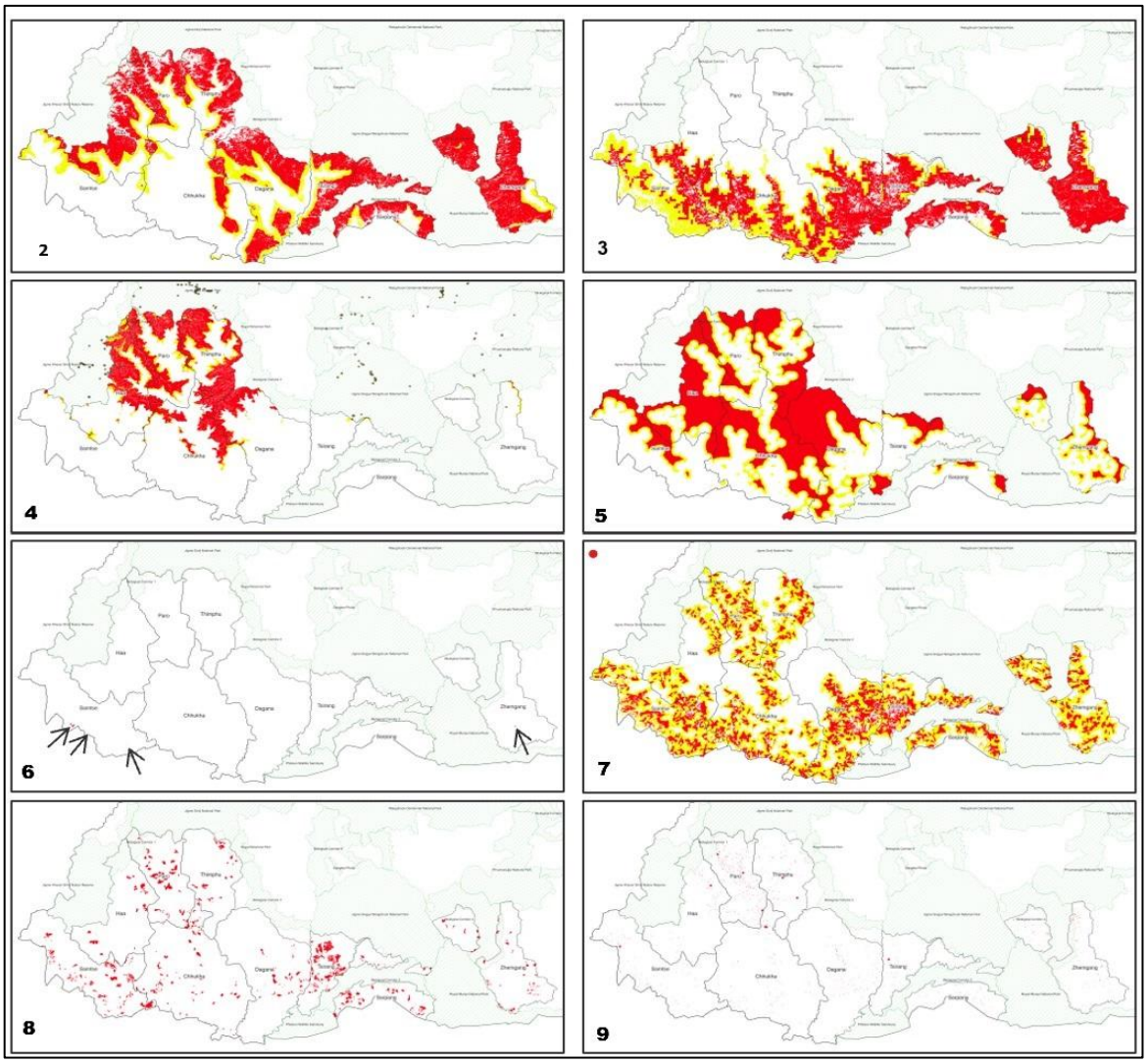


Figure 3: Map 2-9. Selection of HCV probability maps (red high probability of presence, yellow low probability of presence, white – absent) - HCV 1 (Tiger, Rufous-necked Hornbill, Musk Deer); HCV 2; HCV (Refugia); HCV 4 (Critical Springsheds); HCV 5 (Community Forests); HCV 6.

4.2.Identify threats

For selected HCVMA, threats and HCVs at risk, must be identified using summary screening map (Figure 2). This is to be done by overlaying the boundaries of the Selected DFO HCV Management Area with:

1) Threat-based Priority maps (Figure 3)
2) HCV probability maps (Figure 2 & 3)

Identification of affected HCV can be made simpler by referring to the analysis presented in Table 3 that describes the relationship between threats and affected HCVs. Threat maps (Figure 3) can be used to screen HCV process supplementary materials.

Table 2: Identified high-ranking threats on HCVs in the landscape

Threat	**Affected HCVs**
Illegal Logging	HCV 1: Rufous-necked Hornbill; HCV 2: Landscape scale mosaics; HCV 3: Rare ecosystems (Sal and Cloud Forest), Refugia / KBAs; HCV 4: Spring sheds; HCV 5: Community Forests
Poaching	HCV 1: Rufous-necked Hornbill, Tiger, Gaur, Snow Leopard, Black Bear / Common Leopard, Red Panda and Musk Deer
Overfishing - Poisoning	HCV 1: White-bellied Heron and Golden Mahseer
Wildlife-Human Conflict / Reprisal killing	HCV1: Tiger, Gaur, Snow Leopard, Black Bear / Common Leopard, Elephants
Wildfire	HCV 1: White-bellied Heron; HCV 2: Landscape scale mosaics; HCV 3: Rare ecosystems (Sal and Cloud Forest, Refugia / KBAs); HCV 4: Springsheds; HCV 5: NWFPs, Community Forests; HCV 6: Important Cultural Sites
Road Development	HCV 3: Refugia / KBAs; HCV 4: Springsheds
Overharvesting of NWFP	HCV 1: Red Panda (bamboo harvesting) HCV 5: NWFPs
Pests and Diseases	HCV 2: Landscape scale mosaics; HCV 3: Rare ecosystems (Sal and Cloud Forest), Refugia / KBAs); HCV 4: Springsheds;

NOTE:
Not all threats will have the same urgency in all every DFO area. The threat-based HCV Priority maps will assist DFOs to select the most significant threats that should be managed within their jurisdiction. For instance, retaliatory killing due to HWC is less prevalent in the north compared to the southern DFOs. Conversely, wildfire is only likely to have an impact on HCVs in Thimphu, Paro, Haa, Dagana and Tsirang DFOs.

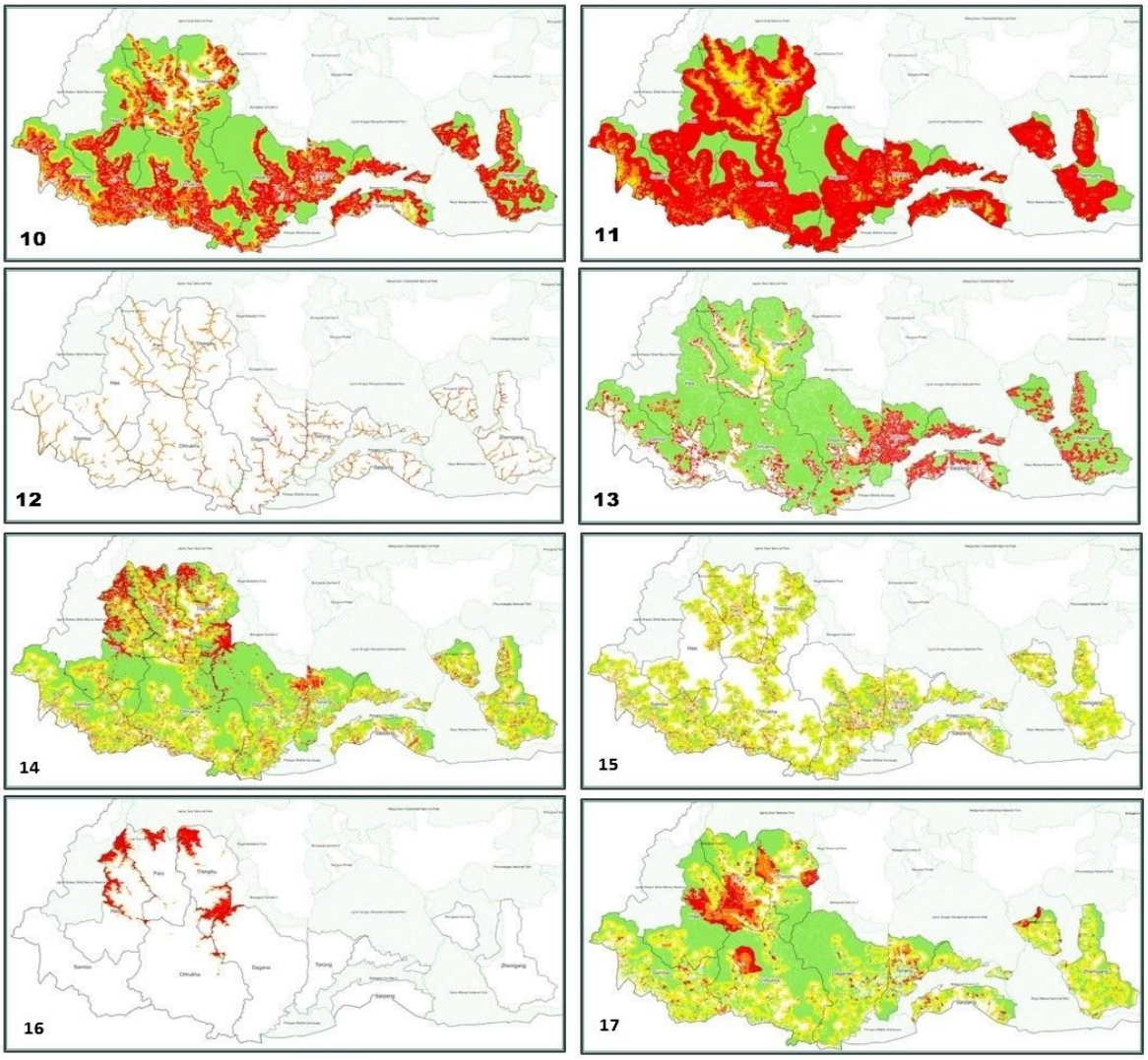


Figure 4: Map 10-17. Threat based HCV Priority maps for illegal logging, poaching, unsustainable fishing, HWC, wildfire, road impact, unsustainable harvesting of NWFP and pest & diseases.

5. Developing HCVA Management and Monitoring Plan

The HCVA management and monitoring plans are one of the components of the DFO management plan. Having selected HCVMA, the Priority falling between 1 – 4 requires a different response mechanism (Figure 5), which serves as a detailed guide to help DFOs in developing management and monitoring plans based on HCV screening outcomes, CS resources and outcome of stakeholder consultation.

Figure 5: Flowchart to develop HCVMA management and monitoring plans

The HCVMA in the DFO plan should contain following sections:

Section 1: DFO level selection of the prioritised HCVMA using screening data
Section 2-3: HCV Management Plans for Priority areas 1 and 2
Section 4: Recommendations for Priority areas 3 and 4
Section 5: Monitoring plans for Priority areas 1 and 2
Section 6: Field Verification and consultation of the draft HCV management and monitoring plan

5.1.Developing HCV Management Plan

The HCVMA prioritized by the DFO were identified based on the likelihood of HCV presence and the associated threats and values requiring immediate attention. This preliminary assessment focuses on key biological, ecological, social, or cultural values and landscape areas, helping to identify information gaps and initiate stakeholder discussions on long-term sustainability. Stakeholders can integrate HCV screening results into broader landscape plans, assess resource needs for prioritizing actions, and use these results as reference materials to develop management and monitoring plans. (Table 3).

- Priority 1: Areas with a high likelihood of HCV presence and significant threats, requiring the highest level of management to sustain HCVs.
- Priority 2: Areas with a high likelihood of HCV presence but potential threats, needing preventive measures.
- Priority 3: Areas with lower likelihood of HCV presence but high threats, warranting precautionary measures, including verifying HCV absence before management prescriptions.

Table 3: Response framework for Priority HCVA produced by HCV screening

Threat level to HCVs	**Probability of HCV Presence**	
	Lower Probability	**Higher Probability**
Higher treat	**Priority 3** (Low HCV Probability & High Threat) **Precautionary Response**	**Priority 1** (High HCV Probability & High Threat) **Active Response**
Lower threat	**Priority 4** (Low HCV Probability & Low Threat) **Secondary Response**	**Priority 2** (High HCV Probability & Low Threat) **Preventative Response**

5.1.1. Priority 1 HCV Management Plan

The presence of potential threats in the landscape should be identified using available data in the FIRMS, SMART and other independent studies conducted at the national and DFO level. For selected HCVMA, threats and HCVs at risk are to be identified and validated in the field by overlaying the boundaries of the selected DFO HCVMA with: 1) Threat-based Priority maps (box 1); and 2) HCV probability map (Box 2).

Box 2: 2A - Identifying threats and HCV affected by threats:

Overlay boundaries of selected HCV Management Area on HCV Priority selected maps and HCV probability maps and define significant threats and relevant HCVs affected by them that occur in the HCVMA.

- ***List of significant threats and HCV affected by threats.***

Accordingly, the significant threats need to be identified for the selected HCVMA and the magnitude assigned to design the response mechanism and timeframe specific to respective DFOs (Table 3). Developing a HCVA management plan first require identifying threats and HCV affected by threats (Box 1) and shall follow the all required steps (Figure 6).

Table 4: Presence and magnitude threats in HCVMA

HCV Priority	Threats in HCVMA	Threat magnitude (H, M, L) *	Response mechanism
1	Poaching	H	Anti-poaching patrol

** Setting timeframe for threat response, threat magnitude H must be implemented first followed by M & L (H:1-3 year; M: 4-6 years; L: 7-10 years).*

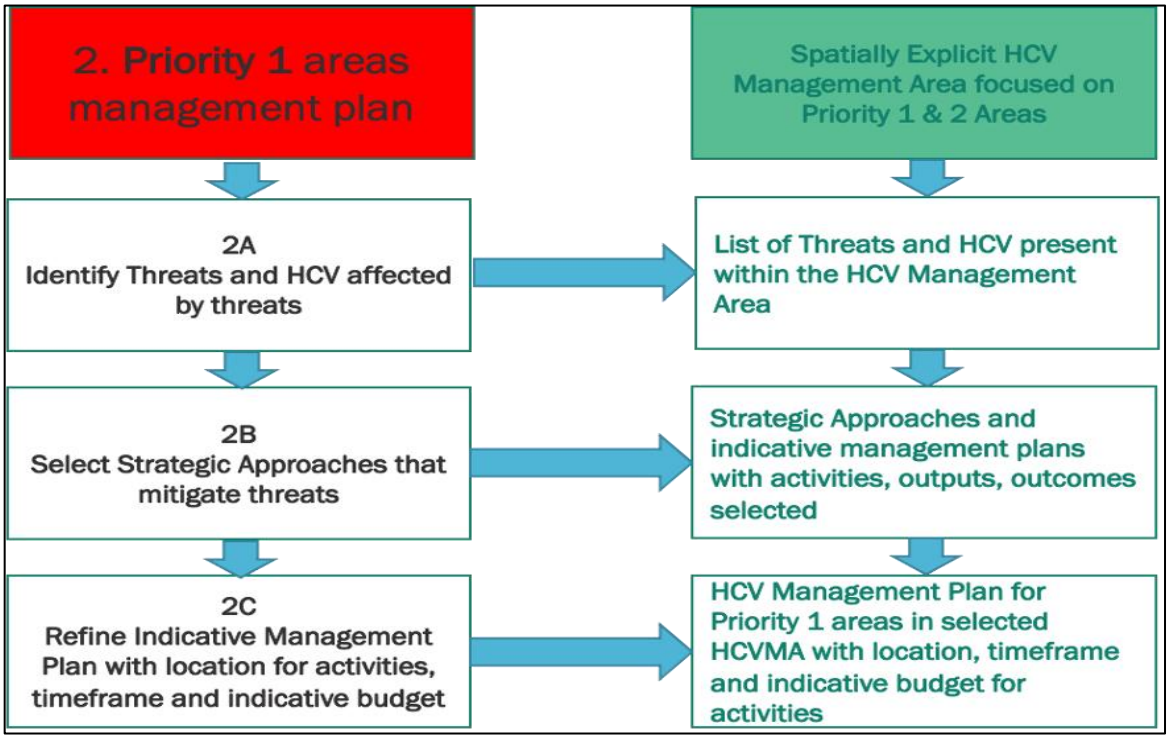


Figure 6: Flowchart in developing Priority 1 HCV management plan

5.1.2.Selecting strategic approaches that mitigate threats

The CS approach is used to identify management strategies to mitigate specific threats to HCVs in the landscape. Begin by developing a situation model to identify threats and contributing factors. Strategic Approaches (SA) are then identified to address these threats (Box 2, Table 4 & Appendix 1). Results chains illustrate the necessary steps to mitigate threats and their root causes, along with example activities (Appendix 2, 4, 6 & 8).

Box 2: 2B

- Strategic Approaches that can mitigate significant threats in the selected HCVMA and copy respective Indicative management Plans from Appendix 2.

* (Strategic Approaches and indicative management plans with activities, outputs, outcomes selected)

To develop management and monitoring plans, select strategic approaches that address significant threats identified in stage 2A & (Table 5). This can be done by referencing the table below, which describes SAs that mitigate specific threats as defined in the situation model.

Table 5: Identifying strategic approaches that could mitigate threats in HCVMA

Significant Threats	**Proposed Strategic Approach**
Illegal Logging	Sustainable Livelihoods; Surveillance and monitoring; Institutional & HR Capacity and Awareness and education
Poaching	Sustainable Livelihoods; Surveillance and monitoring; Institutional & HR Capacity and Awareness and education
Fishing	Sustainable Livelihoods; Surveillance and monitoring, Institutional & HR Capacity and Awareness and education
Retaliatory killing due to HWC	Sustainable Livelihoods; Surveillance and monitoring; Institutional & HR Capacity; Awareness and education and Human Wildlife Conflict Mitigation measures
Forest fire	Surveillance and monitoring; Institutional & HR Capacity and Awareness and education
Road impact	Improved Spatial Planning and Governance
Unsustainable harvesting of NWFP	Sustainable Livelihoods; Surveillance and monitoring; Institutional & HR Capacity and Awareness and education
Pest and diseases	Surveillance and monitoring; Institutional & HR Capacity and Awareness and education
Invasive weeds	Surveillance and monitoring; Institutional & HR Capacity and Awareness and education
Waste	Surveillance and monitoring; Institutional & HR Capacity and Awareness and education

**Threats and strategic approach in Table 3 are not exhaustive, emerging threats need to be identified and could be dealt accordingly.*

This Strategic Approach is usually implemented through interagency advocacy and collaboration between DoFPS, National Land Commission Secretariat, local government, WWF and other relevant stakeholders, beyond the scope of DFO field level management. Refer appendix (2 – 9) for sustainable livelihoods, Institutional and HR Capacity, Human

Wildlife Conflict and Integrated Fire Management indicative management plans as the results chains that were developed.

Table 6: Log frame for DFO management plan

Strategy	Outcome	Outputs	Activity	Location	Timefra me	Baseline	Target	Budget	Lead	Collabor ator

Table 6 shows the log frame for DFO management plan. Strategy refers to one of the four strategic approaches developed. Outcome here refers to reduced threats (e.g., illegal activities reduced). Output are the results expected in the results chain and activities are those that will achieve results. Activities, Outputs and Outcomes can be drafted or appendix (3, 5, 7 & 9) maybe referred to develop Indicative Management Plans under four strategic approaches. Further, refer Appendix 3, 5, 7 & 9 to insert strategies, outcomes, outputs and activities and Table 4 to add location, timeframe, budget, lead and collaborator to complete Table 6.

5.1.3. Priority 2 HCV Management Plan

HCV Screening predicts that Priority 2 areas are not currently at risk from threats. The overall aim of HCV management in Priority 2 areas is to *prevent threats from* emerging through a preventative response. This involves identifying relevant preventative actions in Priority 2 areas and may also include consideration for additional conservation (Figure 6).

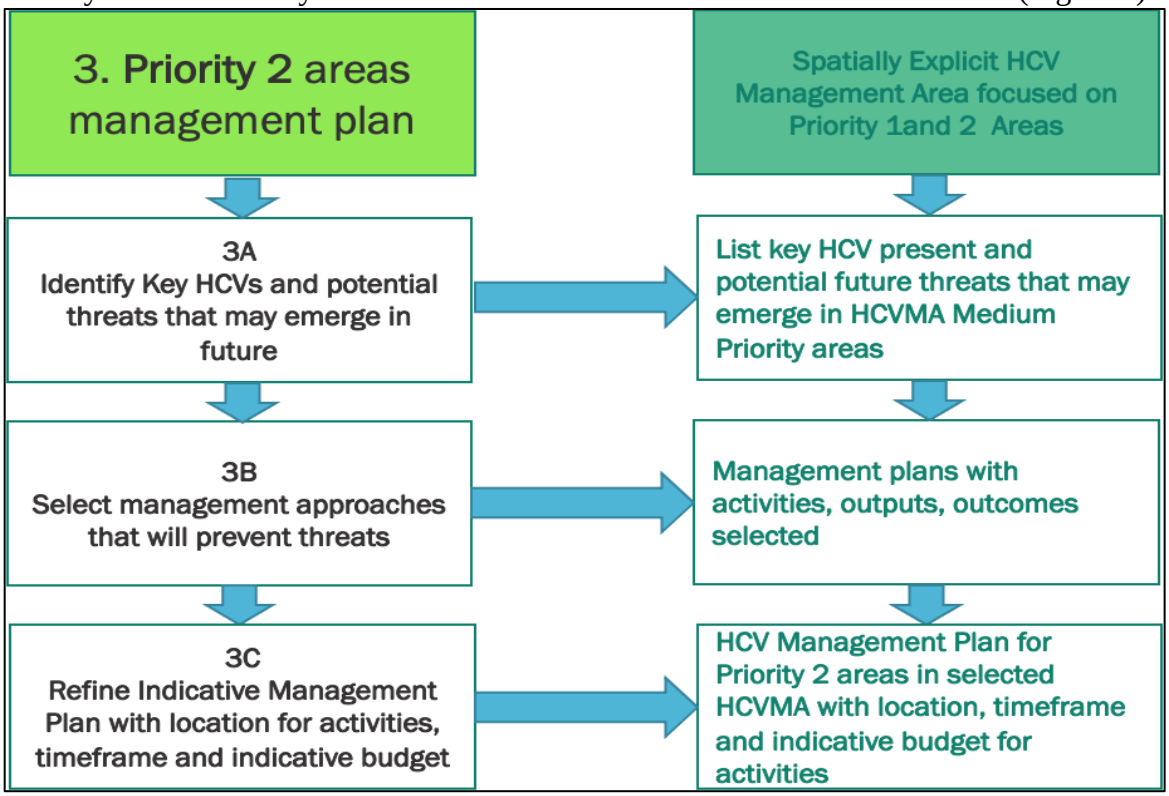


Figure 7: Flowchart in developing Priority 2 HCV management plan

5.1.4.Identify key HCVs and potential threats that may emerge in future

It is important to understand that there is a high presence of HCVs, while potential threats are potentially low in Priority 2 areas. However, it is important to develop the most appropriate form of monitoring of potential future threats (Box 3).

The CS approach and situation model defined the relationships between HCVs and potential threats. Relevant key HCVs are identified by overlaying the boundaries of the selected DFO HCVMA for Priority 2 areas with the individual HCV probability maps (Figure 10-17). Subsequently, potential threats that may affect them in the future can be listed by referring to Table 2.

Box 3:

- Strategic Approaches that can mitigate significant threats in the selected HCVMA and copy respective Indicative management Plans from Appendix 2.

* (Strategic Approaches and indicative management plans with activities, outputs, outcomes selected)

5.1.5.Select management approaches that can prevent threats

The activities, outputs and outcomes in indicative management plans for Priority 2 areas are based on the potential threats and probability of HCV. The indicative plans can be used as the basis of developing management plans (Appendix 2, 4, 6 & 8) for Priority 2 areas.

Box 4: 3B

- Identify relevant indicative monitoring activities that can detect emerging threats in Priority 2 areas in selected HCVMA.

(Monitoring plans with activities, outputs, outcomes selected)

As with management plans in Priority 1 areas, the location for implementing management activities have not been determined and are dependent on the selected HCV Management Areas. DFOs must use the boundaries of the selected HCVMA and HCV Screening summary maps to specify the location, timeframe and budgets required to commensurate with the scale of management activities.

Indicative management plans are designed to be flexible. Other activities and results can be added into the management plans depending on local opportunities or geographic context. The indicative management plan for Priority 2 areas should will be log frame matrix as the Priority 1 areas (Table 7).

Table 7: Log frame for DFO management plan

Strategy	Outcome	Outputs	Activity	Location	Time frame	Baseline	Target	Budget	Lead	Collaborator

5.1.6.Priority 3 and 4 areas

This operational guidance does not stipulate management and monitoring for Priority 3 and 4 areas but provides simple recommendations based on the level of threats.

5.1.6.1. Recommendations for Priority 3 areas

HCV Screening identifies Priority 3 areas where probability of HCV presence is low and threats are high. Priority 3 areas are most closely associated with areas that is close to or has already been developed, and around disturbed ecosystems. While disturbance and threat levels are potentially high in these areas, a precautionary response is still advised as there is still a possibility that HCV might experience an increase in threat in future. The recommendations should be carried out on an *ad hoc* basis when a change of land use is proposed, or opportunities to improve the condition of land in Priority 3 areas.

A precautionary process, when a change in land use or development is proposed within Priority 2 areas, should entail:

- Engagement with relevant stakeholders and rapid HCV field checks prior to development confirm or validate HCV absence and habitat or ecosystem's potential for supporting HCVs in the future.
- Reclassify Priority level, if significant key HCV are detected or documented as being present during monitoring (using the NI as a guide for HCV identification) - these areas should be managed, as set out in section 1 of this guideline.
- While implementing land use change or developmental activities, *precautionary measures* must be adopted.
- Precautionary measures are 'best management practices' such as:
  - avoiding disturbance and development on very steep slopes;
  - maintaining mature ground cover (trees) to the maximum extent possible;
  - restoring ground cover through the appropriate choice of tree species; and
  - avoiding the use of fire to clear ground, among others.

5.1.7.Recommendations for Priority 4 areas

HCV Screening identifies Priority 4 areas as those with a low probability of HCV presence and low risks. Priority 4 areas are mostly associated with agricultural land. The reason for low risk is the fact that HCV are not likely to be present. No HCV management is proposed for Priority 4 (*secondary response*) as these areas are where development has already occurred. The potential for restoration does exist if opportunities arise. Important factors that must be considered before restoration becomes a viable option, include:

- Prior consent from local communities to confirm lack of zero land conflicts (land not used or likely to be used in future); and
- Adequate financial and human resources for restoration and protection.

6. HCV Monitoring

The goal of HCVA management is to maintain or enhance values present in HCVMA over time. A monitoring plan is essential to evaluate management strategies and measure

conservation outcomes. Monitoring provides up-to-date information, aiding adaptive management by allowing adjustments based on results.

Effective monitoring uses indicators to assess HCV maintenance, without needing comprehensive surveys. These indicators must be efficient, consistent, standardized, and repeatable to draw reliable conclusions over time. Standardized monitoring helps distinguish genuine changes in HCV presence from changes due to monitoring methods. Data should be recorded in a centralized database for long-term analysis. Monitoring should ideally start before management activities to establish a baseline and include input from experts and stakeholders.

- The planned management strategy may be ineffective or have encountered practical barriers while implementing.
- The management strategy may be poorly implemented or may have become ineffective over the time have

Monitoring of HCVMA, components such as Operational or compliance monitoring, Strategic or effectiveness monitoring and Threat monitoring using Miradi or other relevant tools.

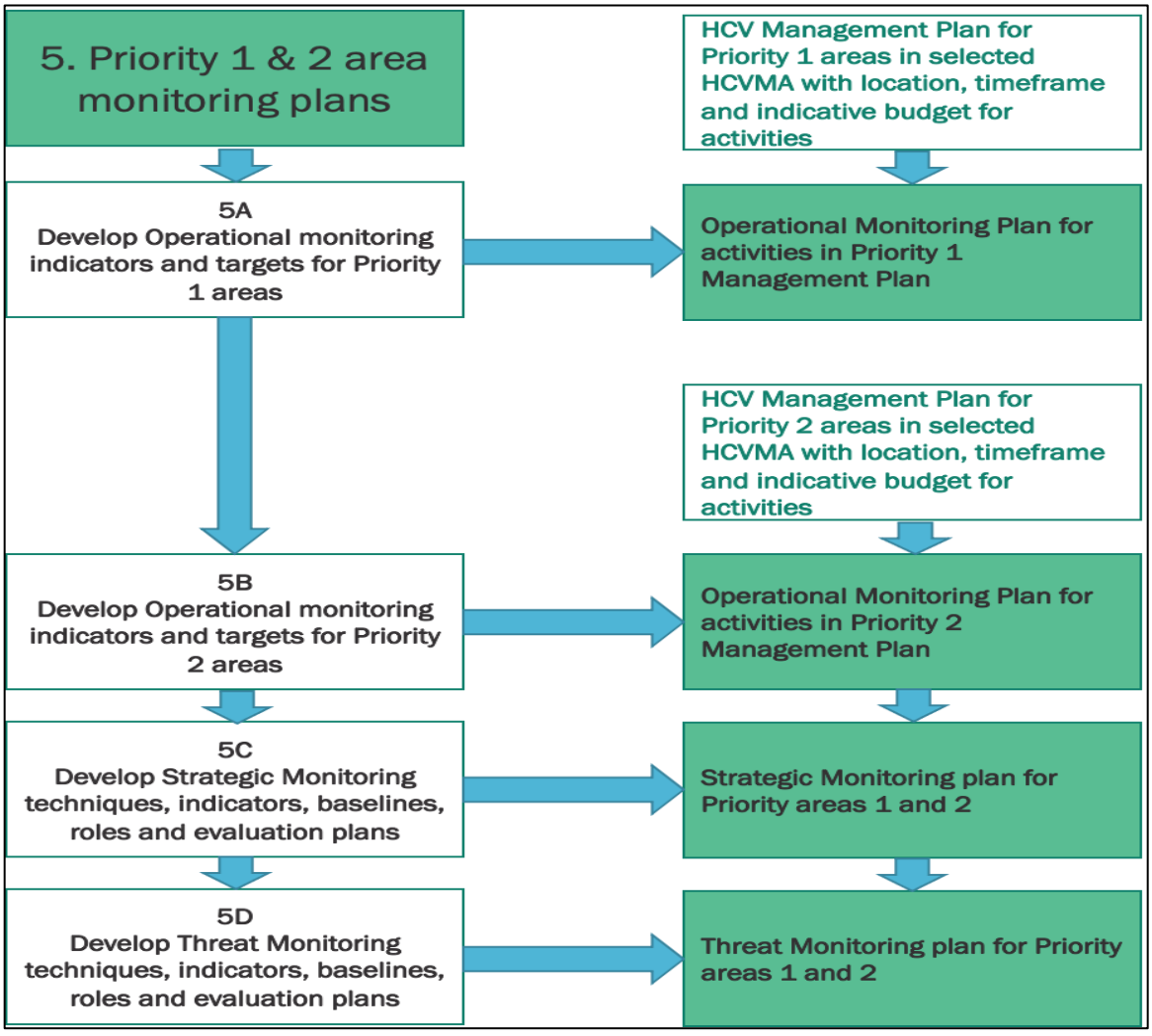


Figure 8: Flowchart for monitoring of HCVMA

6.1.HCVMA Monitoring and Evaluation

Alike all the forest management regimes in the country, HCVMA monitoring and evaluation (M&E) will follow Protected Area M&E framework as in Table 8.

Table 8: HCVMA monitoring and evaluation schedule

Types of M & E	**Responsibilities**	**Timeline**	**Forms**	**Report submission**	**Submission deadline**	**Purpose**
Annual monitoring	Concerned DFO	By 12th month	Annual Monitoring Form	CFO will submit report as per annual monitoring form to FMID	First quarter of following financial year	For operational monitoring
Mid-term Evaluation	**Lead**: FMID **Collaborator**: IKI Taskforce, concerned DFO & other stakeholders	First quarter of 6th year of the plan period.	Mid-Term and Final Evaluation Form	The evaluation team shall submit an evaluation report as per evaluation form to FMID	Within one month after conducting evaluation	For Strategic / effectiveness monitoring
Final evaluation	**Lead**: FMID **Collaborator**: KI Taskforce, concerned DFO & other stakeholders	First quarter of 10th year of the plan period.	Mid-Term and Final Evaluation Form	The evaluation team shall submit an evaluation report as per evaluation form FMID	Within one month after conducting evaluation	

The team composition for monitoring and evaluation of HCVMA will be as per Table 9.

Table 9: HCVMA monitoring and evaluation team composition

Type	**Composition**	**When?**
Annual Monitoring	CFO	1st quarter of every financial year
Mid-term evaluation	IKI Taskforce members Representative from Local Government FMID (lead Agency)	1st quarter of 6th year
Final evaluation	IKI Taskforce members Representative from Local Government FMID (lead Agency)	First quarter of 10th year

The HCVMA shall be monitored and evaluated as part of the area-based plan if it falls under other management regimes or the concerned DFO Plans. For monitoring of Priority 1 & 2 HCVMA, annual activity/operational monitoring will be carried out using Table 10, while

threat response activities shall be evaluated in the mid-term and final evaluation using Table 11. However, for Priority 3 & 4 only threat monitoring will be observed and recorded. Mirada or other relevant tools will be deployed in carrying out threat analysis. Stakeholder consultation must also be done during mid-term and final evaluation.

Activities, measurement unit, baseline and targets are to be inserted from HCV management plan embedded in DFO management plan.

Table 10: HCVMA annual/operational monitoring form

Strategy	**Output Indicators**	**Outputs**	**Activities**	**Measurement unit**	**Baseline**	**Target**	**Achievement %**	**Data/information source**	**Reason for non-**	**Observation by monitoring**	**Recommendat.**
Sustainable Livelihoods	Sustainable Harvesting of Timber										
	Sustainable Harvesting of NWFP										
	Reduced Poaching										
	Sustainable Fishing										
Institutional & HR Capacity	Retaliatory Wildlife Killing or Disturbance Reduced										
Retaliatory Wildlife Killing or Disturbance Reduced	Sustainable and Legal Harvesting of Timber										
Human Wildlife Conflict Mitigation	Reduce HWC (crop damage, livestock depredation, property damage and human casualty)										
Integrated Fire Management	Wildfire Reduced										
Preventative Management	Area remains intact forest										

of Priority 2 Areas	with no significant emerging threats										

Table 11: HCVMA Mid-term and Final Evaluation Form

Output Indicator	**Activities (as per HCVMA plan)**	**Measurement unit**	**Baseline**	**Target (for plan period)**	**Achievement %**	**Achievement Score**	**Data/information source**	**Reason for non-fulfillment**	**Observation by monitoring team**	**Recommendation**
Sustainable Harvesting of Timber							Reports, FIRMS SMART, Publication			
Sustainable Harvesting of NWFP										
Reduced Poaching										
Sustainable Fishing										
Retaliatory Killing or Disturbance Reduced										
Sustainable and Legal Harvesting of Timber										
Reduce HWC (crop damage, livestock depredation, property damage and human casualty)										

**Achievement % & Score: = 1-25% = 1, 25-50% = 2, 50-75% = 3, 75-100%=4*

6.2. Strategic/effectiveness monitoring in Priority 1 HCVMA

Strategic/effectiveness monitoring assesses whether HCVs are maintained by current management plans, if management objectives and targets are met and if management prescriptions are effective in maintaining the HCVs. Unlike annual/operational monitoring, it focuses on the status and long-term trends of HCVs. Techniques include biodiversity surveys, ecosystem assessments, community interviews for HCV 5 and 6, and water quality monitoring. The schedule of the monitoring depends on the value's vulnerability and monitoring costs. For example, endangered species at risk from poaching may require regular patrols. Data from operational and threat monitoring and opportunistic observations can supplement strategic monitoring. However, Table 12 may be referred for identifying potential approaches for strategic monitoring in all HCVMA areas.

Table 12: Potential strategic monitoring techniques

HCV	Potential Strategic Monitoring technique
HCV 1: Biodiversity monitoring	Species population surveys (e.g. # of individuals) through camera trapping or voice / call recording Species presence surveys* Habitat quality surveys (e.g. food plants present) *
HCV 2: Landscape Mosaics and Intact Forest Landscapes monitoring	Annual remote sensing to confirm no increase in deforestation, or fragmentation Forest Integrity Assessments*
HCV 3: Rare and threatened ecosystems and refugia	Annual remote sensing to confirm no increase in deforestation, or fragmentation Forest Integrity Assessments* Vegetation surveys of indicator species (e.g. Sal, Bazzania, Pangolin, Orchid etc.) *
HCV 4: Ecosystem services (Water)	Periodic springshed assessments Water quality and quantity assessments Interviews with communities
HCV 5: Community Needs (NWFP and CF)	NWFP presence / abundance surveys* Community forest integrity assessments*
HCV 6: Cultural Values	Interviews with community and religious leader in landscape

** Technique with asterisk can be combined in a Forest Integrity Assessment.*

6.3. Threat monitoring

Threat monitoring assesses changes in threats to HCVs, focusing on significant threats identified during HCV Screening and any new threats (Table 13). This can involve targeted monitoring through SMART patrols, opportunistic threat recording during operational monitoring, and discussions with those causing the threats. While there is overlap with Priority 2 threat prevention strategies (Appendix 10), these activities may not cover all threats to all HCVs. Below are potential approaches for strategic monitoring in all HCVMAs.

Table 13: Potential threat enlisted during HCV screening stages

HCV 1 – Biodiversity monitoring	Hunting / illegal activities monitoring patrols* Interviews with local communities Opportunistic observations of hunting / fishing*
HCV 2 – Landscape Mosaics and Intact Forest Landscapes monitoring	Monitoring road development plans in the wider landscape Remote sensed fire monitoring (NASA-FIRMS)
HCV 3 – Rare and threatened ecosystems and refugia	Encroachment/logging monitoring patrols* Invasive species monitoring*
HCV 4 – Ecosystem services (Water)	Remote sensing monitoring of forest change and quality in Springsheds Remote sensed fire monitoring (NASA-FIRMS)
HCV 5 – Community Needs (NWFP and CF)	Community interviews on collection intensity Opportunistic observations of commercial collection by non-community members*
HCV 6 – Cultural Values	Remote sensed fire monitoring (NASA-FIRMS)

** Techniques with asterisk can be combined with* SMART patrols.

7. Adaptive Management

Understanding the reasons for changes in HCV status helps managers identify which activities are effective and what adjustments are needed. Therefore, it is crucial to conduct operational, strategic, and threat monitoring together and evaluate results within an adaptive management cycle. This is particularly important when HCV status declines, as it may indicate issues with management implementation, design, or new threats. The evaluation should distinguish these factors. Key questions to consider when evaluating management effectiveness include:

- What changes have taken place in the HCVs, and what caused them?
- Are the planned management strategies and prescriptions being implemented?
- Have the risks and threats facing HCVs changed?
- How effective are the management strategies?
- Are monitoring strategies effectively identifying threats to HCVs and changes in HCV status?

If management activities are implemented as designed, there are no new threats emerging, then the management is not targeting the root cause of threats and should be redesigned. If management activities are implemented as designed, but new threats are emerging, management should be adapted to tackle these threats. Management activities may also need to be scaled up if the HCV is in decline with no new threats and proper implementation.
Evaluation of management using all monitoring results should take place annually to assess progress in meeting management objectives with management areas and strategies modified or refined accordingly based on lessons learned from monitoring results.

7.1.Field Verification and Stakeholder Consultation

Several aspects from the overarching Guiding Principles of the HCV Approach are relevant to developing HCV Management and Monitoring plans for DFO. The HCV approach should:

- Respect legal and customary land rights and other fundamental principles of responsible land use;
- Ensure responsible management of non-HCV areas and support other conservation objectives;
- Incorporate and use relevant scientific data and local knowledge and where significant gaps in existing information are identified, more data should be collected or the precautionary approach applied, commensurate with the degree of risk and uncertainty;
- Be participatory and inclusive, ensuring that all relevant stakeholders and rights-holders are consulted and their views or the information they provide is incorporated into the process and that appropriate existing initiatives are engaged wherever possible;
- Be open and transparent;
- Identify areas required to maintain or enhance the identified HCVs; and
- Include recommendations for management and monitoring program to maintain and enhance HCVs over time through adaptive management;

To meet these guiding principles, it is recommended to carry out field verification and stakeholder consultation before finalizing the HCV management and monitoring plans for implementation.

7.2.Field Verification

Field verification of HCVs and threats included in the HCV Screening process should ideally be verified in the field. SMART and FIRMS data must be used to verify threats to a certain extent but focused verification should ideally be implemented to confirm both the likely presence of HCV and threats to those HCVs.

7.3.Stakeholder consultation

Development of a management and monitoring plan often requires both stakeholder engagement and consultation of external specialists, especially when the scale of HCVs and threats to HCVs are high. It is important to consult stakeholders who know the area well, including academic researchers and specialists working for government departments and environmental NGOs, along with other parties generally concerned with conservation of biodiversity and environmental values.
Consultation should aim to build consensus on the HCV identified through screening, verified through field visits and management strategies adopted, to ensure management activities are in line with current scientific knowledge of HCVs and threats, and to consider potential issues that may arise from the management of different HCVs in the future.

Both national and local level stakeholders may be important to consult for HCV 4. This may include experts in hydrology, flood prevention, erosion control and other environmental services. It would also include those stakeholders who are dependent on HCV 4 ecosystem services. Where HCVs 5 or 6 are present, there should always be consultation with the affected communities on the measures taken to maintain or enhance the values so that the approach is appropriate and has wide support.

At a minimum, this should include communities adjacent to the HCVMA selected and where community forests are included. During the stakeholder consultations, results of the HCV Screening and HCV management plan should be available for review by all those involved in the consultation process. This will allow for feedback and improvements for more effective implementation, especially where existing initiatives are being conducted. It may be necessary for large HCVMA to consult stakeholders during the formulation of the draft management plan and then later to allow inputs to the plan before it is finalized.

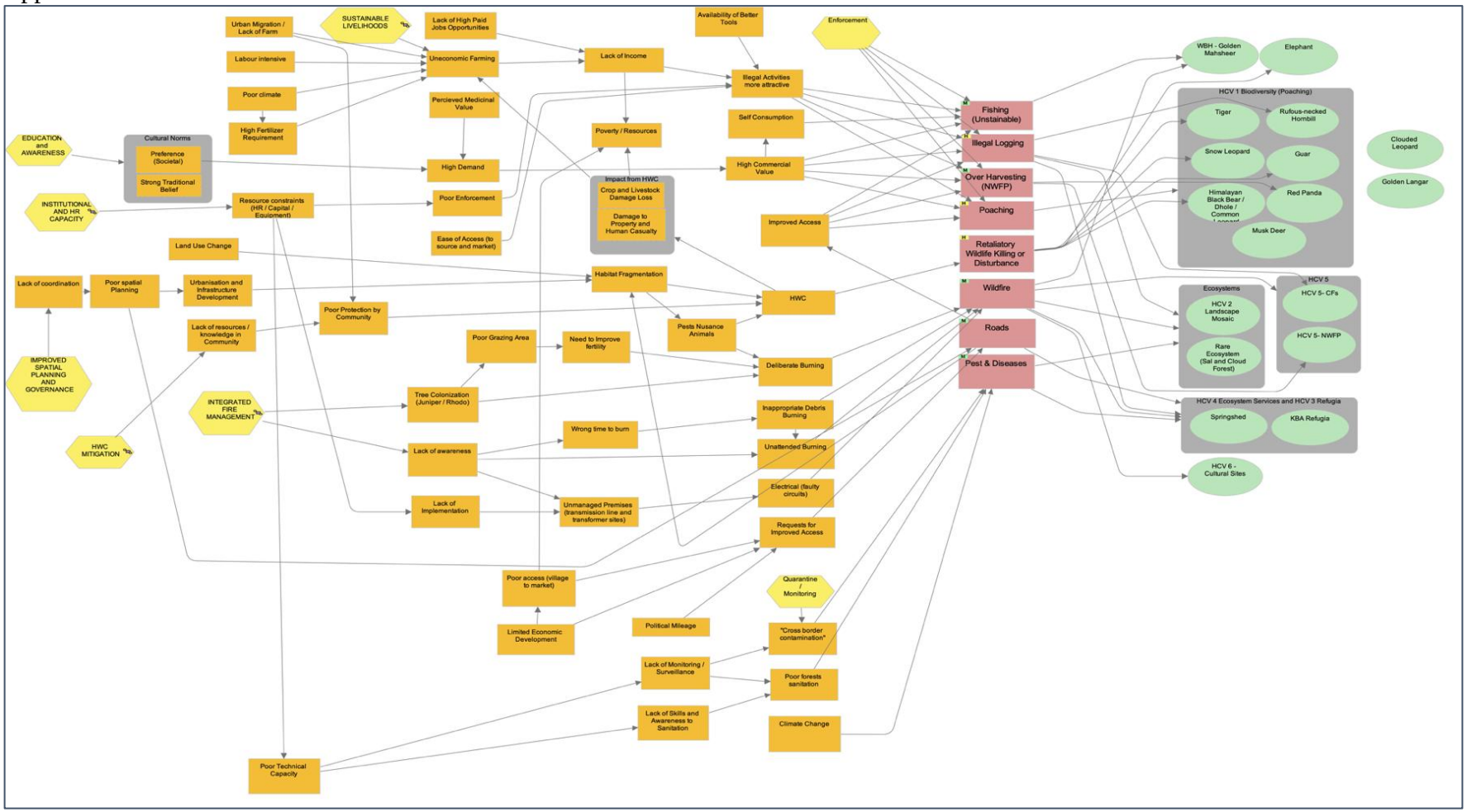
7.4.Finalisation of HCV Management and Monitoring Plans

Once consultation with relevant stakeholders and field verification of threats & HCV present has been conducted during the M&M plan design phase, activities, location, indicators and targets can be refined for validation and approval.

8. Appendix:

The Conservation Standards approach applied completed a Situation Model (SM) illustrating direct threats and indirect contributing factors and identified key Strategic Approaches (SA) that could be implemented to mitigate 1 or more threats.

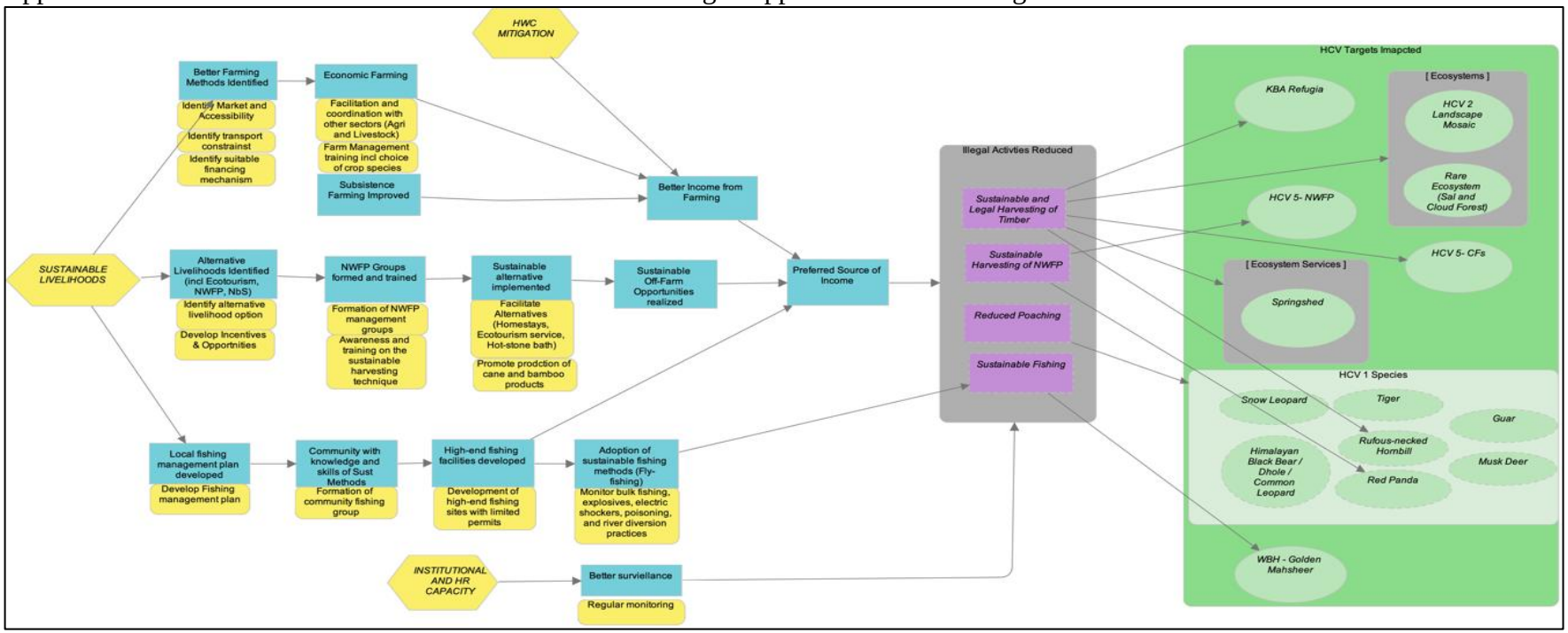
Appendix 1: Situation Model



Appendix 2 - Results Chains and Indicative Management Plans

'Results chains' were developed for 4 strategic approaches (SA). These diagrams detail a 'chain of results' that if achieved, would likely alleviate threats on the HCV conservation targets. Indicative activities that could deliver these results were identified. SA results chains were then translated into indicative management plans can be used as the foundation of HCV Management and Monitoring Plans in selected HCVMAs.

Appendix 2: Results Chain for Sustainable Livelihoods Strategic Approach to reduce Illegal Activities



Appendix 3 - Sustainable Livelihoods Strategic Approach

This Strategic Approach aims to alleviate pressures of illegal activities that are largely carried out due to financial pressures felt by the community. HWC mitigation and Institutional and HR Capacity of the DFO Strategic Approaches can also feed into this Sustainable Livelihoods approach.

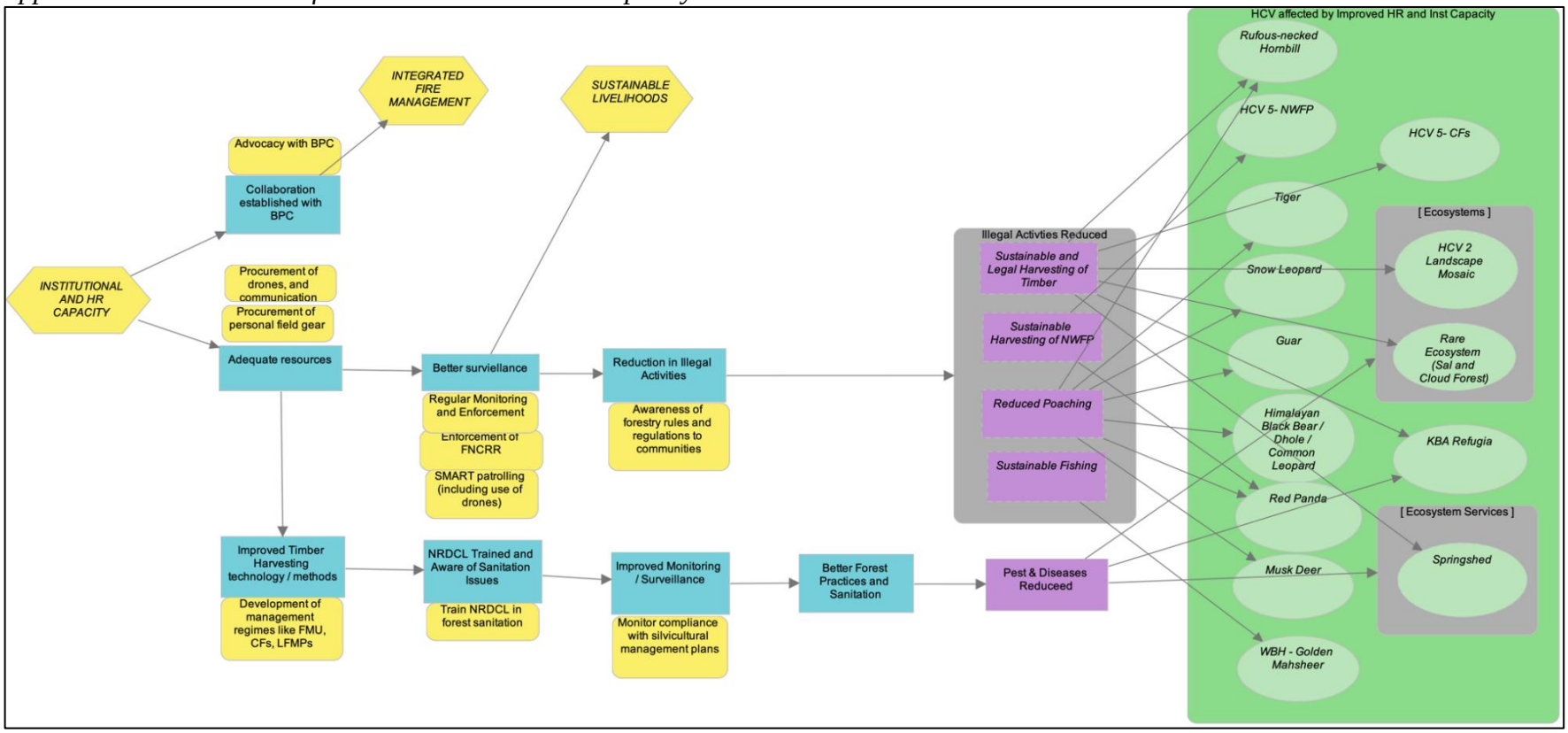
Appendix 3: Sustainable Livelihoods Indicative Management Plan

STRATEGY	OUTCOMES	OUTPUTS	ACTIVITY
Sustainable Livelihoods	Sustainable and Legal Harvesting of Timber, Sustainable Harvesting of NWFP Reduced Poaching	Alternative Livelihoods Identified (incl. Ecotourism, NWFP, NbS)	Identify alternative livelihood option
			Develop Incentives & Opportunities
		NWFP Groups formed and trained	Formation of NWFP management groups
			Awareness and training on the sustainable harvesting technique
		Sustainable alternative implemented	Facilitate Alternatives (Homestays, Payment for Environmental Services, Ecotourism service, Hot-stone bath)
			Promotion of alternative products (cane and bamboo products etc.)
		Better Farming Methods Identified	Identify Market and Accessibility
			Identify transport constraints
			Identify suitable financing mechanism
		Subsistence Farming Improved & More Economic Farming	Facilitation and coordination with other sectors (Agri and Livestock)
			Farm Management training including choice of crop species
	Sustainable Fishing	Local fishing management plan developed	Develop Fishing management plan
		Community with knowledge and skills of Sust Methods	Formation of community fishing group
		High-end fishing facilities developed	Development of high-end fishing sites with limited permits
		Adoption of sustainable fishing methods (Fly- fishing)	Monitor bulk fishing, explosives, electric shockers, poisoning, and river diversion practices

Appendix 4 - Results Chain for Institutional and HR Capacity

This Strategic Approach aims at providing the appropriate human and technical resources within DFOs to carry out their roles in managing forests and mitigating threats. In general, better resources and training within the DFOs will allow for better monitoring and surveillance of forest activities, better outreach to communities about rules and regulations and train forest user in improved forest management to mitigate threats for pest and diseases.

Appendix 4: Results Chain for Institutional and HR Capacity



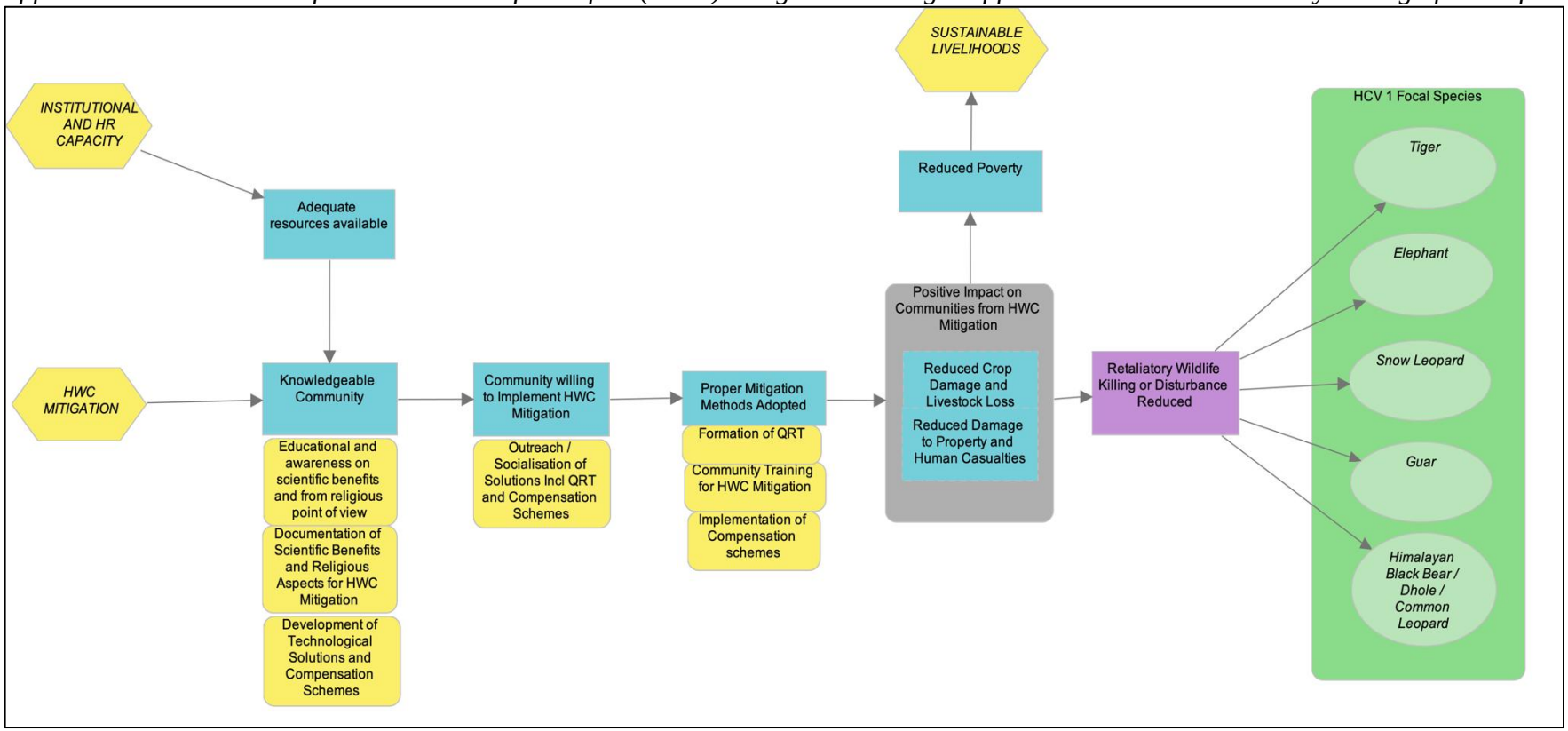
Appendix 5: Institutional and HR Capacity Indicative Management Plan

STRATEGY	OUTCOMES	OUTPUTS	ACTIVITY
Institutional & HR Capacity	Sustainable and Legal Harvesting of Timber Sustainable Harvesting of NWFP Reduced Poaching Sustainable Fishing	Adequate resources	Procurement of personal field gear
			Procurement of drones, and communication equipment, binoculars
		Collaboration established with BPC	Advocacy / Outreach to BPC
		Better surveillance	Regular Monitoring and Enforcement
			Enforcement of FNCRR
			SMART patrolling (including use of drones)
		Reduction in Illegal Activities	Awareness of forestry rules and regulations to communities
	Pest & Diseases Reduced	Improved Timber Harvesting technology / methods	Development of improved management regimes in FMU, CFs, LFMPs
		NRDCL Trained and Aware of Sanitation Issues	Train NRDCL in forest sanitation
		Improved Monitoring / Surveillance Better Forest Practices and Sanitation	Monitor compliance with silvicultural management plans

Appendix 6 - Results Chain for Human Wildlife Conflict Mitigation

The Human Wildlife Conflict Mitigation Strategic Approach is focused on reducing retaliatory killing due to past conflicts that will occur if crop damage, loss of livestock, damage to property and human casualties are reduced. The approach focuses on awareness and training, combined with technological solutions and formation and operationalisation of quick response teams to prevent conflicts from occurring.

Appendix 6: Results Chain for Human Wildlife Conflict (HWC) Mitigation Strategic Approach to reduce Retaliatory Killing of Wildlife



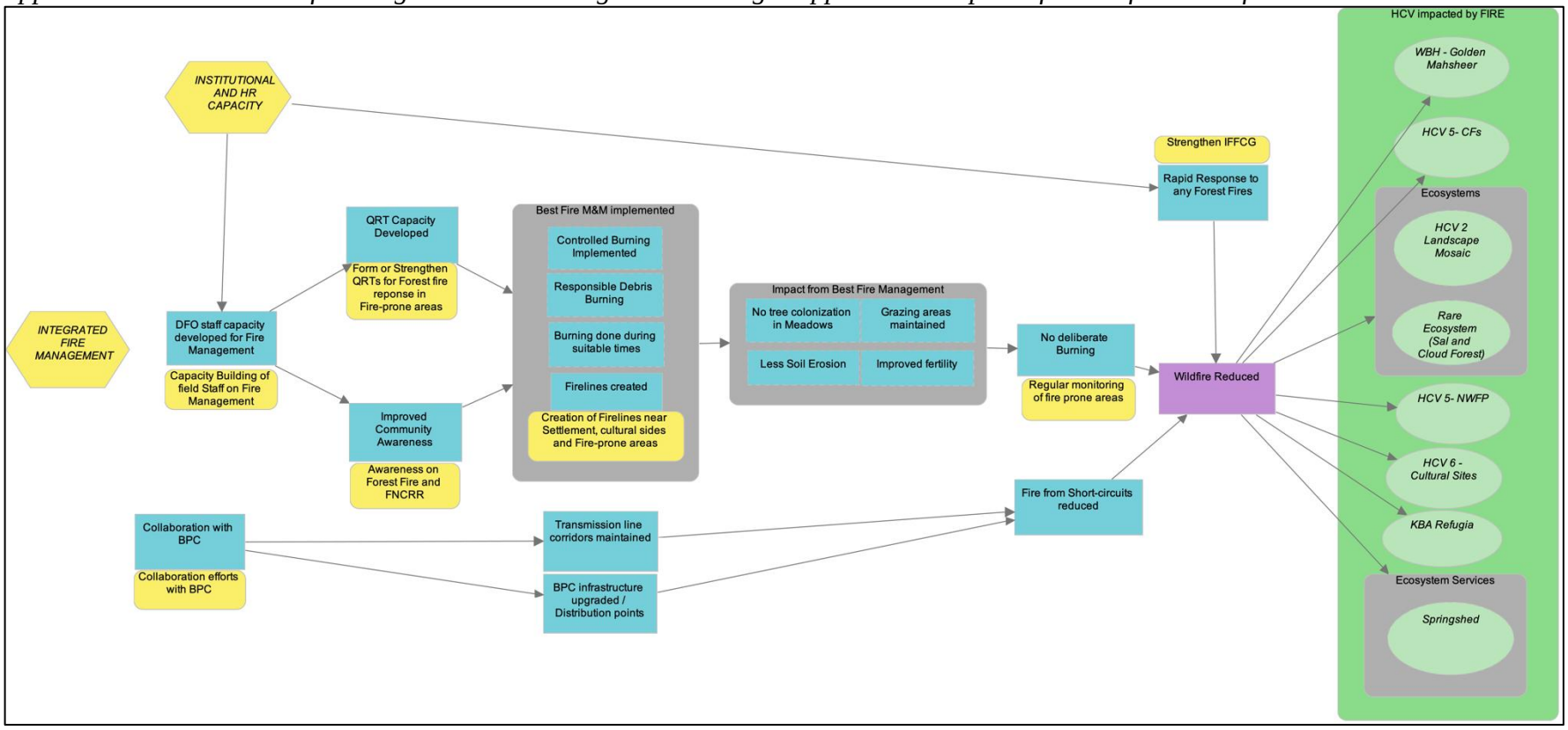
Appendix 7: Human Wildlife Conflict Mitigation Indicative Management Plan

STRATEGY	OUTCOMES	OUTPUTS	ACTIVITY
Human Wildlife Conflict Mitigation	Retaliatory Wildlife Killing or Disturbance Reduced (Reduced Crop Damage and Livestock Loss & Reduced Damage to Property and Human Casualties)	Knowledgeable Community	Educational and awareness on scientific benefits and from religious point of view
			Documentation of Scientific Benefits and Religious Aspects for HWC Mitigation
			Development of Technological Solutions and Compensation Schemes
		Community willing to Implement HWC Mitigation	Outreach / Socialisation of Solutions including QRT and Compensation Schemes
		Proper Mitigation Methods Adopted	Formation of QRT
			Community Training for HWC Mitigation
			Implementation of Compensation schemes

Appendix 8 - Integrated Fire Management

Integrated fire management strategic approach is focused on reducing wildfires that can have a dramatic impact on the forests of Bhutan. The approach aims to strengthen responses to fire but also prepare for potential wildfire through collaboration with communities and the Bhutan Power Company, monitoring for rapid reaction and prevention through developing fire-lines in sensitive sites where needed.

Appendix 8: Results Chain for Integrated Fire Management Strategic Approach to impact of HVCs from Wildfires



Appendix 9: Integrated Fire Management Indicative Management Plan

STRATEGY	OUTCOMES	OUTPUTS	ACTIVITY
Integrated Fire Management	Wildfire Reduced	DFO staff capacity developed for Fire Management	Capacity Building of field Staff on Fire Management
		Improved Community Awareness	Awareness on Forest Fire and FNCRR
		QRT Capacity Developed	Form or Strengthen QRTs for Forest fire response in Fire-prone areas
		Best Fire M&M implemented; Impact from Best Fire Management	Creation of Fire-lines near Settlement, cultural sides and Fire-prone areas
		No deliberate burning	Regular monitoring of fire prone areas
		Collaboration with BPC	Collaboration efforts with BPC
		Rapid Response to any Forest Fires	Strengthen IFFCG

Appendix 10: Indicative Management Plan for Priority 2 Areas

STRATEGY	OUTCOMES	OUTPUTS	ACTIVITY
Preventative Management of Priority 2 Areas	Area remains intact forest with no significant emerging threats	Forest and Biodiversity Integrity maintained	Biodiversity monitoring
			Water quality monitoring
			Conduct Forest Integrity Assessment
		Emerging Threats identified	Periodic Long-Range SMART Patrolling
			Grazing impact study
			Firewood collection monitoring
			NWFP collection monitoring
			Pest and diseases
		Sustainable Forest Management Regime Developed and Operationalized	Forest inventory
			Production Area Identification and Survey
			Management prescription development
			Implementation and periodic monitoring
		Increased stakeholder engagement	Coordinated planning among stakeholders

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2025