



Government of India



Guidelines for Mitigating Human-Blue Bull Conflict

Taking a Harmonious-Coexistence Approach



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Ministry of Environment, Forest and Climate Change



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Abbreviations

BMZ	German Federal Ministry for Economic Cooperation and Development	JFM	Joint Forest Management
CWLW	Chief Wildlife Warden	MoEF&CC	Ministry of Environment, Forest and Climate Change, Government of India
CZA	Central Zoo Authority	NDRF	National Disaster Response Force
DBT	Direct Benefit Transfer	NGO	Non-governmental organization
DFO	Divisional Forest Officer	NTCA	National Tiger Conservation Authority
DLCC	District-level Coordination Committee	NTG	National Technical Group
DNA	Deoxyribonucleic acid	NWAP	National Wildlife Action Plan
EIA	Environmental impact assessment	OPs	Operating procedures
EWRR	Early Warning and Rapid Response	PA	Protected area
GIS	Geographical information system	PCCF	Principal Chief Conservator of Forest
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit	PPE	Personal protective equipment
Gol	Government of India	PRT	Primary Response Team
HBLC	Human-Blue Bull Conflict	RFID	Radio frequency identification
HOFF	Head of Forest Force (in a state)	RRT	Rapid Response Team
HWC	Human-wildlife conflict	SDRF	State Disaster Response Force
HWC-MAP	Human-Wildlife Conflict Management Action Plan	SFD	State forest department
HWC-NAP	National Human-Wildlife Conflict Mitigation Strategy and Action Plan	SHG	Self-help group
HWC-SAP	State-level HWC Mitigation Strategy and Action Plan	SLCC	State-level Coordination Committee
IFS	Indian Forest Service	SOPs	Standard operating procedures
IUCN	International Union for Conservation of Nature	WII	Wildlife Institute of India
		WLPA	Wild Life (Protection) Act, 1972

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1. ABOUT THE GUIDELINES

1.1 THE OVERALL CONTEXT

- These guidelines on Human–Blue Bull Conflict (HBLC) mitigation get their overall context from the Wild Life (Protection) Act, 1972, National Wildlife Action Plan (2017-35)¹, the Advisory to Deal with Human–Wildlife Conflicts (MoEFCC 2021) and the National Human–Wildlife Conflict Mitigation Strategy and Action Plan of India (2021–26) (HWC-NAP)². HWC-NAP provides the overall conceptual and institutional framework for implementing these guidelines.
- These guidelines take into consideration the existing guidelines and advisories issued by various state government and build on them to bring about a more holistic approach to HBLC mitigation.
- The following guidelines on cross-cutting issues are to provide guidance on selected issues: Guidelines for Cooperation between the Forest and Media sector in India: Towards effective communication on Human-Wildlife Conflict Mitigation; Occupational Health and Safety in the Context of Human–Wildlife Conflict Mitigation; Crowd Management in Human-Wildlife Conflict Related Situations; and Addressing Health Emergencies and Potential Health Risks Arising Out of Human–Wildlife Conflict Situations: Taking a One Health Approach.
- In addition to the HBLC mitigation guidelines, following guidelines are to provide guidance on other selected species: guidelines for mitigating human–Elephant, –Leopard, –Gaur, –Snake, –Crocodile, –Macaque, –Wild Pig, –Bear and –Blackbuck conflicts.

1.2 PURPOSE AND SCOPE

- The guidelines aim to facilitate a common understanding among key stakeholders on what constitutes effective and efficient mitigation of HBLC in India, and to ensure standardization in performing mitigation operations in the most effective and efficient manner, with minimum damage to people and Blue Bulls.
- The guidelines provide advice on mitigation measures to address HBLC in the long term, as well as facilitate the development, assessment, customization and evaluation of site-specific HBLC mitigation measures that are effective and wildlife-friendly.
- The holistic approach of the guidelines entails addressing not only the emergency situations arising due to immediate conflict situations but also the drivers and pressures that lead to HBLC; providing guidance on establishing and managing prevention methods; and reducing the impacts of conflicts on both humans and Blue Bulls.
- The guidelines serve as a basis for long-term planning and coordination of HBLC mitigation measures at the state and division levels and provide good practices in using humane mitigation operations to ensure the welfare of Blue Bulls along with humans.
- In general, the guidelines apply to all stakeholders relevant to HBLC mitigation and are not limited to state forest departments (SFDs).
- The guidelines will be able to bring in more effectiveness and efficiency when fully integrated into the division-level HWC Management Action Plans (HWC-MAP) and state-level HWC Mitigation Strategy and Action Plans (HWC-SAP).

1.5 INSTITUTIONAL FRAMEWORK FOR IMPLEMENTING THE GUIDELINES

- The institutional mechanism outlined in the HWC-NAP will be followed for implementing these guidelines.

1 MoEFCC (2017). National Wildlife Action Plan (2017-35)

2 National HWC Mitigation Strategy and Action Plan of India (2021-26), available from <https://moef.gov.in/wp-content/uploads/2022/01/National-Human-Wildlife-Conflict-Mitigation-Strategy-and-Action-Plan-of-India-2.pdf>

3 Harmonious coexistence is defined as a dynamic but sustainable state in which humans and wildlife adapt to living in shared landscapes, with minimum negative impact of human-wildlife interaction on humans or on their resources and on the wildlife or on their habitats. The mitigation measures designed using this approach maintain a balance between the welfare of animals and humans where both are given equal importance. Overlap in space and resource use is managed in a manner that minimizes conflict.

4 Supplementary frameworks to the HWC-NAP <https://moef.gov.in/wp-content/uploads/2022/01/National-Human-Wildlife-Conflict-Mitigation-Strategy-and-Action-Plan-of-India-2.pdf>

1.3 APPROACH

- The development and implementation of these guidelines is driven by a harmonious-coexistence approach³ to ensure that both humans and Blue Bulls are protected from negative impacts of HBLC.
- The guidelines address the issue of HBLC, taking a holistic approach. The holistic approach of the guidelines entails addressing not only the emergency situations arising due to immediate conflict situations but also the drivers and pressures that lead to HBLC; providing guidance on establishing and managing prevention methods; and reducing the impacts of conflicts on both humans and Blue Bulls.
- The development of these guidelines and intended implementation are driven by a participatory approach. These guidelines are intended to facilitate participatory planning, development and implementation of HBLC mitigation measures with key sectors and stakeholders at the national, state and local levels.
- The guidelines highlight on the need for a landscape approach while formulating solutions for mitigating HBLC to ensure sustainable solutions as unless comprehensive and integrated HBLC mitigation measures are implemented across the landscape, the problem is likely to only shift from one place to another.
- Efforts have been made to forge linkages with plans and guidelines of key relevant sectors for enhancing synergies and eliminating trade-offs at the field level.
- Taking a capacity development approach, the guidelines facilitate the implementers through an *Implementer's Toolkit* that contains operating procedures (OPs), formats, checklists and other field implementation aids.

1.4 LEGAL AND POLICY FRAMEWORK FOR IMPLEMENTING THE GUIDELINES

- These guidelines are to be read in conjunction with the existing relevant legal and regulatory frameworks, especially the Wildlife (Protection) Act, 1972. The following legislations are considered directly relevant for conservation when dealing with HBLC:
 - Wildlife (Protection) Act, 1972
 - Prevention of Cruelty to Animals Act, 1960
- Other important laws that facilitate conservation when dealing with HBLC include the Environment Protection Act, 1986; Indian Penal Code, 1860; Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006; the Indian Forest Act, 1927; the Forest (Conservation) Act, 1980; the Environment (Protection) Act, 1986; and Disaster Management Act, 2005.
- Sections 9, 11(1)(a) (2) (3), 12(bb), 29, 35(6) and 39(1)(a) of the WLP Act 1972 are especially relevant when dealing with HBLC.
- *The Supplementary Framework to HWC-NAP on Legislative Framework for HWC Mitigation in India*⁴ is to be referred to for more details on the specific legal provisions for HWC mitigation.

2. CONTEXT AND SITUATION

- The Blue Bull (*Boselaphus tragocamelus*), popularly known as the Nilgai, is the largest amongst Asian antelope species, and is endemic to the Indian sub-continent. Blue Bulls are found in land with scattered trees, short dry savannah grasslands, thorny woodlands, plains and low hills covered with scrub. The combination of their grazing and browsing activities makes Blue Bulls an important part of the ecosystem and a good indicator of habitat quality.
- Habitat loss, fragmentation and degradation, together with expanding crop fields due to an increasing human population and inadequate crop guarding methods, have led to situations causing HBLC. In many states, the natural habitat of the species has either shrunk drastically or has been degraded severely, resulting in Blue Bulls foraging well inside human-dominated landscapes and far from forest edges. Further, a reduced tolerance of people towards crop losses has accentuated the conflict situation—both factually and in terms of perception.
- The species co-occurs with another antelope, the Blackbuck, in some parts of the country. The Blackbuck is a Schedule I species under WPA-1972, and therefore, differential mitigation strategies need to be designed for the Blue Bull and the Blackbuck, as per the level of protection given to these species under the act.
- Human-Blue Bull Conflict (HBLC) refers to the negative interaction between humans and Blue Bulls, leading to adverse impacts such as injury of humans, loss of crops and other property or even impacts on emotional well-being, and equally negative impacts on Blue Bulls or their habitats.
- All-India population estimates are required for the species.
- To ensure effective HBLC mitigation, there is a need for further information and knowledge management on effective crop guarding methods against Blue Bulls, and standardization of capture and translocation methods for the Blue Bull in India. Chemical capture methods are available, particularly for single animals or small herds. However, the drug of choice and the capture, handling and transportation of Blue Bulls need to be standardized.
- HBLC mitigation is also being addressed by the agricultural sector in India, under the All India Network Project on Vertebrate Pest Management of the Indian Council of Agricultural Research (ICAR) under the Ministry of Agriculture and Farmers Welfare, Government of India.

3. ADDRESSING THE DRIVERS AND PRESSURES OF HBLC

The National HWC Mitigation Strategy and Action Plan envisage a holistic approach to HWC mitigation by considering and addressing the thematic triangle of drivers–prevention–damage mitigation. These guidelines have been prepared in line with the recommended holistic approach to bridge the current gaps. A combination of different approaches (including habitat integration, effective crop protection measures and crop insurance) has been suggested to address the drivers and pressures of HBLC.

3.1 ZONATION

- Zonation takes into consideration the resources available and allows a science-based pragmatic approach to landscape-level planning for conservation and HBLC mitigation.
- **Zone 1 - Blue Bull habitat zone:** This zone is in forested areas. Hence, specific management interventions for HBLC mitigation are not required.
- **Zone 2 - Human–forest interface:** There is an active need to manage the Blue Bull population in this zone. Agricultural institutions and panchayats may be engaged as active stakeholders. Preventive measures such as barriers may prove to be effective in this zone. Long-term population management can also be planned for this zone.
- **Zone 3 – Blue Bull exclusion or removal zone:** In this zone, Blue Bulls inhabit refuges, agricultural fields away from the forest, wastelands and village forests or agricultural fields and have adapted well to humans. These populations are not very dependent on the adjoining forests and depend on agriculture primarily.

3.2 MONITORING AND MANAGING HABITAT-RELATED DRIVERS AND PRESSURES

- Focused efforts should be made to prevent or minimize the degradation and loss of remaining natural/near-natural habitats of Blue Bulls existing outside protected areas. Habitats may be restored to support the existing populations and to sustain restricted populations in remnant near-natural habitats.

- As high-energy crop species attract Blue Bulls, there is a need to sensitize farmers and change the type of crops and develop market-linked instruments.
- An assessment of the long-term outcomes and implications of all mitigation methods is needed to identify effective and wildlife-friendly mitigation measures to address HBLC. A systematic analysis of HBLC mitigation methods may be done to assess their effectiveness and wildlife-friendliness in different types of conflict situations. This will facilitate the customization and adoption of mitigation measures to achieve the best possible impacts in field. Cross-sectoral cooperation, especially between the forest and agriculture sectors, is critical for addressing the drivers of HBLC.
- Due to the dominance of invasive species that out-compete native vegetation for space, there may be a reduction in the prevalence of native woody shrubs and a suppression of native tree species, which may result in increased HBLC. Therefore, efforts may be made towards removal of invasive species from critical Blue Bull habitats.
- A local overabundance⁵ of wildlife (including Blue Bulls) could be due to various factors, including habitat loss, degradation and fragmentation of natural habitats and increases in populations. Several Blue Bull populations in the fringes of forests have become habituated to humans. Therefore, there needs to be a clear understanding of the spatio-temporal distribution of a population, its foraging and ranging patterns and its use of human-dominated landscapes. The population dynamics of Blue Bulls in crop fields where there are resident populations may be understood, and changes in their behavioural attributes may be recorded.

⁵ 'Local overabundance' refers to the occurrence, in a habitat, excessive number of individuals of a species beyond the normal population density, due to a variety of factors.

3.3 MEASURES TO STRENGTHEN CROSS-SECTOR COOPERATION TO BE INSTITUTIONALIZED

Cross-sectoral cooperation for HBLC mitigation entails engagement of multiple stakeholders from different sectors and domains at the state level, at the landscape level and at the forest division/district level. Key stakeholders for HBLC mitigation will include the SFD, the agriculture department and other institutions under the agriculture sector, the district administration, the animal husbandry department, the health department, the family welfare department, the education department, local schools and colleges, local hospitals, wildlife conservation and development NGOs, farmers' cooperatives and agricultural research and extension institutions.

- State-level coordination committees (SLCC), a landscape-level multi-stakeholder forum and district-level coordination committees (DLCC) may be used to strengthen the inter-agency coordination required for HBLC. A district-specific operational mechanism may be developed to address specific needs of HBLC mitigation.
- Safety audits focusing on crop protection measures may be conducted each year, if feasible, to ensure that all act responsibly and to facilitate inter-agency cooperation.
- Coordination between the forest and agriculture sectors is important, and dedicated programmes at the national, state and district levels may be formulated to effectively implement these guidelines.
- Workshops and dialogues with and training of the local community, especially members of the PRI institutions, may be organized at all HBLC hotspots to ensure a common understanding of the gravity of situations when the option of hunting is to be exercised.

3.4 MEASURES TO STRENGTHEN THE SYSTEM OF KNOWLEDGE MANAGEMENT IN HBLC MITIGATION

To ensure that HBLC mitigation measures are effective, wildlife-friendly and sustainable, it is essential that field experiences, learnings, field-evidence and conceptual advances, especially related to crop protection measures, be not only shared across key stakeholders and landscapes but also documented to be utilized for future strategies and plans related to HBLC mitigation.

- Landscape-level multi-stakeholder fora and appropriate working groups may be used to share field experiences, learnings, evidence and conceptual advances within the forest department, across stakeholders and across landscapes.
- Measures may be put in place to systematically document field experiences, learnings, field-evidence and conceptual advances related to HBLC mitigation to inform future strategies and plans.

3.5 SYSTEMATIC RESEARCH AND MONITORING ADDRESSING HBLC

Specific information on the distribution, abundance and interactions of Blue Bulls with humans is not available for most places. Most studies report encounter rates of Blue Bull signs, and there is little effort to calculate the population index or local population details. Appropriate monitoring methods are not used. Current population densities, the demographic structure of various populations and general behaviour may be thoroughly quantified before any population management intervention is done.

- Camera trap studies conducted in interface areas and agricultural fields can provide a more detailed and better estimate of the population and behavioural ecology of the Blue Bulls and facilitate further strengthening of crop protection measures.
- Studies may be conducted on the intensity of conflict, crops affected, crop types, distance from forest/refuge, age/sex of individuals foraging on the crops, etc. to assign conflict intensity levels to various sites and establish priority sites for conflict mitigation.
- The crop foraging behaviour of herds and individuals (both species-specific and landscape-specific) may be studied (availability of food in natural habitats, responses to deterrents and barriers, crop preferences, etc.) in high-density areas and along the fringes of protected areas. The field personnel of the concerned departments (including the forest department) may be engaged in the monitoring and in the contribution of research data.
- Trends and efficacy of the *ex gratia* schemes
- Collaborative studies at HBLC hotspots for developing long-term measures

4. DEPLOYING MEASURES TO PREVENT HBLC

4.1 MAPPING HBLC HOTSPOTS AND MONITORING THE POPULATIONS AT HOTSPOTS

It is not feasible to individually identify a Blue Bull-in-conflict. Identification- and mapping-related measures cannot be based on the individual animal approach for the Blue Bull.

- HBLC hotspot⁶ maps (indicating low- to high-conflict areas) may be prepared and regularly updated to help create a dynamic (spatio-temporal) map of the conflict zones.
- Currently, most of the hotspot maps have been developed using data from past incidents. However, to understand the vulnerability of an area to conflict, and the probability of conflict taking place, the hotspots can be categorized as follows:
 - a. Incident hotspots: Frequency of occurrence of incidences over a specific period (such as previous 5 or 10 years), mapped over the target area. The data include the number of incidences of crop and livestock injury and loss, injury and death of humans.
 - b. Vulnerability hotspots: Cumulative index, by overlaying past incidents the vulnerability of the local community and the potential risk of the area.
- Analysis of incident hotspots will help identify factors affecting conflict incidents and therefore will help identify key factors to be used for predicting HWC hotspots.
- There is an urgent need to monitor populations of Blue Bulls particularly in and around HBLC hotspots, using standardized monitoring protocols and trained field teams. Other departments, especially the agriculture department, local universities, NGOs and research institutions may be engaged, if possible, to ensure sustainability.
- Monitoring and maintenance of water sources in and around HBLC hotspots may also be ensured as the species mostly inhabits arid regions and herds might move to human landscapes for water.
- The forest department, together with the agriculture department and other institutions, may train community PRTs to plan and maintain deterrents along the boundaries and to engage them in Blue Bull driving operations.

4.2 SUPPORT LOCAL COMMUNITIES IN CROP PROTECTION MEASURES

Education and awareness programmes may be carried out to sensitize the communities to use wildlife-friendly crop protection measures and to the need for continuous improvisation.

- Since historical habitat fragmentation and loss are very difficult to address, the most suitable mitigation measures to mitigate HBLC are effective crop protection measures, including fencing and crop guarding, to prevent Blue Bulls from venturing into croplands.
- Collaborative efforts by the SFDs and the agriculture sector, using new technology, are required to develop innovative crop protection measures.
- Although there are reported incidents of Blue Bulls jumping over fences and these animals can go through strand-based fences, fences are by far the most effective solution. Barriers such as chain-link fencing and pulsating power fences are highly effective, but they are relatively expensive to install and maintain.
- Traditional preventive measures, like constructing walls, stacks of rubble and fences of tree and shrub branches, may be adopted as these can be constructed with readily available materials and require low maintenance.
- The effectiveness of conventional and power fences may be enhanced using technological interventions, and landscape considerations, as follows:
 - Fences to be erected on the croplands abutting forest boundaries. Where the terrain does not permit continuous fencing, special design interventions (such as hanging fences over rivers or streams) may be considered. Manual guarding may be adopted during the sensitive season at the vulnerable points where either fencing is not possible or a fence is unlikely to be effective.
 - A Blue Bull fence should be a sufficiently tall chain link (woven wire) fence, a solar fence or a hybrid fence (woven wire fence with two or three strands on top). Barbed-wire fences must not be used due to the risk of serious injury to animals.
 - Chain link or woven wire fences may be made of flexible steel to minimize injury to animals hitting

⁶ "HWC Hotspots" are areas with actual or predicted repeated occurrence of HWC incidents resulting in crop-loss, livestock death, human death and injury, wildlife death and injury over temporal and spatial scales. It can be static (repeated in the same place or time) or dynamic (shift in space and time over years). In addition to count statistics, the magnitude of the incidents is subjected to interpolation or extrapolation techniques to define the hotspots in space and time.

the fence at speed. Where possible, the use of specialized woven galvanized fences or similar fences may be explored.

- Suitable view breakers such as thatch patches or metal plates may be used to warn the animals about the existence of the fences and avoid injuries incurred by hitting them or running into them.
 - If the fence is also meant to provide protection against Wild Pigs or any other burrowing animals, it may be grouted at least one metre below the ground, preferably with one or two electrified strands close to the ground.
 - If fencing the forest boundary is not possible or is impractical, farmers may be encouraged to go for collective fencing in order to reduce the cost.
- Even the strongest fences can be damaged by various causes. Effective arrangements for repair and maintenance may be put in place at the time of planning a fence.
 - Participatory planning, implementation, maintenance and periodic assessment of the effectiveness and necessary customization of crop guarding measures by Panchayati Raj Institutions may be encouraged.
 - The possibility of receiving financial support from existing schemes and programmes, especially the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), can be explored to facilitate the development of barriers and implement other crop protection measures.
 - The following are some deterrents that do not cause injury to Blue Bulls and yet are effective:
 - Crop guarding (manual guarding, patrolling with devices or dogs, etc.)
 - Visual or acoustic barriers (colourful or plastic ribbons)
 - Making sounds by beating drums or tins, etc.
 - Planting thorny bushes around the crop area (*Euphorbia*, *Opuntia*, *Ziziphus*, *Agave* species)

4.3 SCIENTIFIC MANAGEMENT OF BLUEBULL POPULATION AT HBLC HOTSPOTS

Effective mitigation measures along with capture at HBLC hotspots can reduce the impact on crop fields.

Mitigation measures leading to complete elimination of Blue Bull populations from a landscape with natural

habitats may not be beneficial for the health and stability of the overall agro-ecological system in the landscape. Such measures may be implemented at forest-fringe areas and human-dominated landscapes only after long-term studies have been conducted and field-evidence of the possible ecological impacts has been collected.

Site-specific solutions are required, depending on whether the Blue Bull population comes from the adjoining forests or is resident entirely on the farmland. The population connected to a forest may be a part of the prey base of the predators inhabiting the natural forest. Therefore, any mitigation measure that results in a significant reduction of the Blue Bull population may affect the predator population as well.

In addition, another factor that could determine the nature of the mitigation measures is whether the population consists of small isolated herds or it is a large contiguous population occupying a large area.

4.4 ADDRESSING ZONOTIC AND OTHER EMERGING DISEASES, TAKING A ONE HEALTH APPROACH

Handling wild animals invariably involves a zoonotic risk. Although Blue Bulls are not known to transmit major zoonotic diseases, isolated cases of tuberculosis, rabies and brucellosis have been recorded, necessitating precautions when handling these animals.

- Hence, translocation of animals-in-conflict is to be done keeping in mind the effect on and the probability of transmission of diseases to the recipient wild population.
- The veterinary capacities and infrastructure may be upgraded to facilitate disease-monitoring in Blue Bull populations for conservation for prevention of the spread of zoonotic diseases to livestock and human populations.
- A well formulated Wildlife Health Management and Disease Surveillance Plan may be in place at every division/protected area.
- The basic approach is to integrate the concept of 'One Health'⁷, which links human and animal health in a shared environment, into all the operations and HBLC mitigation measures in the field.

⁷ One Health is a collaborative, multi-sectoral and trans-disciplinary approach—working at the local, regional, national and global levels—with the goal of achieving optimal health outcomes, recognising the interconnection between people, animals, plants and their shared environment.

5. ADDRESSING THE EMERGENCY SITUATIONS ARISING DUE TO HBLC

Emergency or crisis situations can be defined as situations that are sudden, unexpected or, have the potential to be serious/are serious in nature and therefore require immediate interventions in time and space from concerned stakeholders to minimize the loss of lives and assets. In this context, such situations would include Blue Bulls foraging on crops and moving dangerously close to human habitations, posing a risk to human lives, livestock and other assets. The response to such emergencies involves prompt handling of the situations, ensuring reduced vulnerabilities of humans and Blue Bulls.

This is an indicative list of potential emergency situations:

- A Blue Bull has killed/injured a person.
- A Blue bull has damaged property/crops.
- A Blue Bull has entered a human-use area (agricultural field or settlement area).
- A Blue Bull has been injured due to retaliatory action and needs to be rescued.
- A Blue Bull has died due to retaliatory action.

Key response procedures may be established, and actions promptly implemented/undertaken for addressing emergency situations. Detailed step-by-step guidance may be developed as “Operating Procedures for Addressing Emergency response Situations”. The key emergency response procedures may include the following:

5.1 ESTABLISHMENT OF EMERGENCY RESPONSE MECHANISM

- A robust mechanism to promptly trigger an emergency response may be established in vulnerable divisions right from early detection of the incident to communication with key officials and information dissemination for initiation of appropriate response actions at the site.

5.2 INTRA- AND INTER-AGENCY COORDINATION AND COOPERATION

- Procedures may be laid down in each HBLC hotspot, in line with these guidelines, and in line with the institutional framework suggested under the HWC-NAP, to ensure timely coordination amongst the various response teams (the forest department, agriculture department and institutions, District Magistrate/District Collector, police, fire services, animal husbandry department, health department, SDRF, NDRF, paramilitary forces and the local community, especially local panchayat leaders and village community PRTs).

5.3 PREPAREDNESS OF RESPONSE TEAMS

- Detailed operating procedures may be laid down to ensure that the capacities and capabilities of the various response teams (community PRTs, RRTs) are adequately established and they are facilitated in their capacity development through training programmes and other measures, including training sessions on occupational health and safety.

5.4 ACTION AT THE ONSET OF AN EMERGENCY OR SPECIFIC SITUATION

- Operating procedures may be laid down to receive, channelize and disseminate information at the onset of any emergency from the site of the incident to related forest officials and the HWC Mitigation Hub. The information will be disseminated further to requisition a related response action at the emergency site.

5.5 KEY RESPONSE ACTIONS DURING AND AFTER AN EMERGENCY

- Operating procedures may be laid down, in line with the other guidelines issued by MoEF&CC, for stepwise key actions, for all emergency situations, media engagement, crowd management, addressing health emergencies and post-response operation for management of the animal. This includes ensuring the animal's health and safety during capture, transport, selection of a translocation site and monitoring the animal after the animal is released safely into the wild.

6. REDUCING THE IMPACT OF HWC ON THE HEALTH AND OVERALL WELL-BEING OF AFFECTED HUMANS

6.1 ADDRESSING A SITUATION OF LOSS OF HUMAN LIFE

- Part of the *ex gratia* payment may be made immediately to the victim's family/heirs, and the balance payment may be made at the earliest.
- The payments to the victim's family should be made into their bank accounts.
- In the HBLC hotspots, a revolving fund may also be established, at the division-level, to ensure that funds are available for providing immediate relief to the victim/family.

6.2 ADDRESSING A SITUATION OF CROP AND PROPERTY DAMAGE

The most important manifestation of HBLC is damage to crops, property (damage to fences, houses, etc.) and other assets (livestock injury/death). Rarely, encounters may lead to human injury or death. The crop damage due to Blue Bull activities varies from state to state. Therefore, different measures may be implemented as per the situation.

A wide range of approaches could be envisaged that encourage local communities to live and prosper in a Blue Bull habitat. These approaches could be based on the principles of co-existence, co-management, participatory planning, risk assessment, strategies used to change perceptions, poverty alleviation programmes, community-based natural resource management and other forms of stakeholder engagement.

- Insurance schemes require participants to pay a premium for insurance against economic loss. This premium is determined on the basis of the risk associated with HWC/HBLC. The challenges of high premiums (due to high levels of risk) have been addressed in some areas by meeting the premiums with government or non-governmental funding support, community financing (e.g., through ecotourism) or better risk evaluation. Dialogues with the insurance sector may be initiated for providing insurance cover for damage due to HBLC. The modalities may vary from place to place according to the assessment of risk by the Insurance companies. The feasibility may be explored at the state level.
- Coordination between the forest, revenue and agricultural departments will be critical for addressing crop damage situations arising from the presence of Blue Bulls in agricultural landscapes. In areas with high HBLC pressures, a team with officials from all the three departments may be trained and empowered to employ mitigation strategies.

- Development of methodologies for crop damage assessment would be important.
- Agriculture education, research and extension institutions may include a holistic approach to HWC mitigation in their programmes to enhance awareness about crop protection measures, the schemes available for *ex gratia* payments and the procedures to be followed to avail oneself of the *ex gratia*. This will help reduce the vulnerability of farmers to crop damage arising from Blue Bull activities.
- The Ministry of Agriculture and Farmers Welfare has included crop loss by activities of wild animals under its flagship scheme *Pradhan Mantri Fasal Bima Yojana* (PMFBY), which can be used as an important HWC mitigation instrument.
- The process of *ex gratia* for crop or property loss should be transparent and simplified. Mobile apps may be used for collecting the information and for processing the claims of farmers after crop losses from Blue Bull activities to ensure efficiency and transparency in the system. Experiences and success-story sharing across states can facilitate further improvements in the system. Appropriate protocols are to be developed for speedy and objective assessment of the damage and providing relief. Sufficient delegation at the field level may be ensured to arrive at decisions and disburse the *ex gratia* payment. Any trauma due to HBLC would thereby be addressed effectively.
- Farmers may be encouraged, and facilitated through community-based institutions, to explore solutions such as changes in cropping patterns and the use of non-palatable crops. Collaborative efforts can be made to promote market-based arrangements for alternate crops, wherever feasible.
- Cooperative guarding may be encouraged, and farmers can be trained in developing and maintaining effective barriers. Community Primary Response Teams (PRTs) may be engaged to facilitate this process in their respective villages/areas of jurisdiction.
- Site-specific studies may be conducted to find out appropriate crops that are non-palatable to Blue Bulls, in collaboration with agricultural institutions.

7. REDUCING THE IMPACT OF HBLC ON THE HEALTH AND WELL-BEING OF BLUE BULLS

7.1 OVERALL CONTEXT

- All care should be taken to address the issues of animal welfare and animal rights as enshrined in the Constitution (Articles 48A and 51A(g)) and as per the statutory provisions made under the Indian Penal Code (Sections 428 and 429), Prevention of Cruelty to Animals Act of 1960 (Section 11(1)(h) and Section 11(1)(d)), Motor Vehicles Act, 1978 (Transport of Animal) Rules, 2001) and guidelines issued by the MoEF&CC.

7.2 ADDRESSING THE HEALTH AND WELL-BEING OF BLUE BULLS DURING CAPTURE AND TRANSLOCATION AND AFTER CAPTURE

One of the major complications during Blue Bull capture is mortality or morbidity due to capture myopathy, which may appear within hours, days or months after the operation. This is a result of the stress and struggle experienced by the animals during the capture.

Capture myopathy can be reduced by avoiding predisposing factors and minimizing unnecessary physical handling during mass capture operations.

- A trained wildlife veterinarian should participate in capture and translocation operations in order to deal with any unforeseen emergency that may arise.
- Customized vehicles for Blue Bulls may be designed for immediate movement of the animals from capture hotspots to rescue centres/lifetime care or translocation sites.

- The transportation vehicle may have interconnected compartments so that animals of different ages and sexes can be separated. Mixing young ones with adult males should be avoided to prevent smaller animals getting crushed. Similarly, more than one male is not to be transported together in a single compartment. The vehicle may be driven straight to the translocation site and off-loaded using a ramp that fits on the back of the truck.
- Tranquilizers may be administered to calm the animals during transportation. The animals should be handled gently but firmly at all times.
- If the captured animals are released in an enclosure, it is easier to monitor their health and behaviour. It also allows them to adapt to the new environment. The enclosures may be fenced with non-deleterious materials, and the fences may be made visible and recognizable to the animals (by using thatched matting, etc.) to make sure that the animals do not collide with them and sustain injuries.
- If captured animals are released in the wild, they may be marked for identification (using RFID tags, if available and feasible), and all encounters may be recorded and reported to a central database. If the number of translocated animals is large, running into 100 or more, a monthly assessment of the numbers released may be made to ascertain the status of the population.
- Identification-marking during release may facilitate post-capture monitoring for getting information for decision-making on mitigation measures.

8. USE OF LEARNINGS FROM THE GUIDELINES TO FURTHER STRENGTHEN INSTITUTIONAL AND POLICY FRAMEWORK ON HBLC MITIGATION IN INDIA

These guidelines are expected to serve as a capacity development instrument, given that a robust and structured feedback mechanism will be put in place to document the feedback arising from their implementation.

- The feedback arising from the use of these guidelines may, therefore, be consolidated to form the basis

for fine-tuning these mitigation measures and for understanding capacity needs for effectively implementing the mitigation measures.

- In the long term, the consolidated feedback may also be used in further reviewing of the capacity development strategies, HWC-MAPs, HWC-SAPs and HWC-NAP.

9. PROCESS OF DEVELOPMENT, PILOT-TESTING OF THESE GUIDELINES AND THE CONSULTATION PROCESS

- A dedicated framework of experts (Annexe 1) was formed that consisted of representatives of Government agencies, SFDs, research institutions, civil society institutions and international organizations and independent wildlife policy experts. The experts were a mix of scientists, wildlife managers, policy experts and capacity development experts.

- A common understanding was developed on the overall purpose, scope, approach and methodology⁸. The experts played different roles in the drafting and editing process (Coordinating Lead Authors, Lead Authors, Contributing Authors, Review Editors). The Author Group worked on developing these guidelines between July 2019 and August 2021, during which time they consulted a larger group of experts and stakeholders via workshops, meetings and consultations. The authors reviewed the documents and guidelines available from the MoEF&CC and different states, and relevant information and recommendations were brought into this new document. A National Technical Group (NTG), consisting of experts from MoEF&CC, Wildlife Institute of India (WII) and *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) and independent wildlife and

policy experts, was formed for the overall steering and facilitation of the process. A 'Working Group on Pilot Implementation of Guidelines and HWC-NAP' was formed to facilitate the planning and implementation of the pilot testing, consultations and final editing of the draft guidelines and the HWC-NAP. Detailed terms of reference were provided, and meetings and workshops of the author groups were facilitated under the Indo-German Cooperation Project on Human–Wildlife Conflict Mitigation.

- The draft guidelines and HWC-NAP were pilot tested at selected HWC hotspots in India to receive feedback on the feasibility and acceptability of the recommendations expressed in the guidelines, using structured processes and tools. On the basis of the feedback received during fortnightly meetings and one-to-one consultations with managers, the draft of the guidelines was revised.
- A Committee was constituted by MoEF&CC in December 2022, consisting of officials from MoEF&CC, and the state forest departments of Bihar, Haryana, Karnataka, Tamil Nadu, Uttarakhand, Uttar Pradesh, West Bengal to review and finalize the guidelines.

10. MONITORING AND EVALUATION OF GUIDELINES

- This set of guidelines is not a static document; rather, it is a living document. It will keep abreast of the various developments in field implementation methods and wildlife research. For this to happen, the feedback from field practitioners and other wildlife experts may be analysed to assess the specific elements and sections that need to undergo changes. A review of these guidelines is planned to take place every 5 years from

2023 onwards. However, a mid-term review process may be desirable in 2024. In the long term, the review cycle of these guidelines can be aligned with the review cycle of HWC-NAP.

- The mechanism, templates and guidance for collating information and feedback on the use of these guidelines are to be elaborated.

8 Approach paper: <https://indo-germanbiodiversity.com/pdf/publication/publication19-04-2021-1618808050.pdf>

ANNEXE 1

NATIONAL TECHNICAL GROUP (NTG)

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