Multi-stakeholder identification and prioritization of human–tiger conflict reduction measures in Chitwan National Park, Nepal

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Abstract The identification and implementation of conflict reduction measures are necessary to reduce predator attacks on people and livestock and to minimize human encroachment into predator habitats. We identified potential human–tiger conflict reduction measures and prioritized these measures for Chitwan National Park, Nepal. We identified these measures through a literature review, key informant interviews and a local stakeholder workshop. We prioritized the identified measures using a questionnaire survey of victims of tiger attacks (farmers, forest users and fishers), beneficiaries of tiger conservation (tourist guides, Jeep and elephant safari operators, tour and hotel operators and business operators) and National Park managers. We identified 22 measures (12 preventative, five reactive and five mitigative) as having potential for reducing negative interactions between people and tigers. Amongst these, we identified compensation payments, tiger-proof fences and habitat and prey management as high-priority measures. Conflict reduction priorities also varied amongst stakeholder groups. The victims assigned the highest priority to the construction of tiger-proof fences, whereas beneficiaries identified the management of habitat and prey as their highest priority. Compensation payments were the first preference of National Park managers and were amongst the top two priorities of all stakeholder groups. We recommend the adoption of the identified stakeholder priorities for reducing human–tiger conflict around Chitwan National Park and encourage consideration of the variations in priorities between stakeholder groups during policy development and decision-making.

Keywords Chitwan National Park, human–tiger conflict, Nepal, *Panthera tigris*, reduction measures, stakeholders

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Received 16 February 2023. Revision requested 13 June 2023.
Accepted 13 November 2023.

Introduction

Large carnivores are declining, mostly as a result of habitat loss and conflict with people (Ripple et al., 2014). This conflict is often characterized by predation of livestock and in some cases by predation on people, and human encroachment on predator habitat. The identification of appropriate and acceptable conflict reduction measures is important for conserving large carnivores and addressing human societal goals. Including the perspectives and expectations of multiple stakeholders, especially grassroots stakeholders, is critical for developing acceptable measures (Redpath et al., 2017).

Unresolved conflict between people and tigers *Panthera tigris* in Asia is one of the most critical threats to conservation of this species. Tigers attack and threaten both people and livestock (Goodrich et al., 2011). This leads to socio-economic and psychological distress amongst affected local communities (Barua et al., 2013), retaliatory killings of tigers and reduced support for their conservation (Lamichhane et al., 2017; Dhungana et al., 2022). Although such conflicts are reported from all areas where tigers and people co-occur, their extent and nature vary widely (Goodrich, 2010).

Historical efforts were focused on lethal control of tigers, but with the precipitous decline of tiger populations in the 20th century the use of non-lethal measures has gained momentum (Treves & Karanth, 2003). Conflict reduction measures are of three types: (1) preventative measures to avoid conflict before it occurs, (2) reactive measures to end or alleviate an existing conflict, and (3) mitigation measures to reduce the impacts of ongoing conflict (Goodrich, 2010). Commonly adopted conflict reduction measures include tiger translocations, predation early-warning systems, use of deterrents, insurance and compensation payments, habitat management and conservation education about tigers (Goodrich, 2010; Lamichhane et al., 2017; Karanth et al., 2018). Decision-makers are often responsible for mitigating conflict despite the differences of opinion amongst stakeholders, lack of resources and uncertainty of success (Barlow et al., 2010). Although selection of appropriate measures to reduce conflict depends on multiple socio-economic, ecological and technological factors, a multi-stakeholder approach to developing human–carnivore

conflict reduction strategies is most likely to succeed because such an approach considers concerns and priorities from a range of people whose roles are critical for achieving conservation goals (Treves et al., 2009; Barlow et al., 2010). Identifying mutually acceptable conflict reduction measures can help reconcile differences amongst stakeholders and develop the joint ownership and social acceptability (Treves et al., 2009) of measures that could meet most stakeholder expectations.

The tiger is a flagship species in Nepal. As a result of successful conservation, in 2022 Nepal became one of the first countries to nearly triple its tiger population compared to 2009 estimates. Tigers in Nepal occur mainly in three isolated subpopulations in and around five national parks (DNPWC & DFSC, 2022). The increase of the tiger population began in the late 1990s, associated with the better management of national parks, designation of managed buffer zones around national parks and the implementation of community forestry programmes (CNP, 2018). This followed the introduction of a landscape approach through the Terai Arc Landscape Strategy and Action Plan (2005–2015) and associated enhancement of transboundary cooperation between India and Nepal for conservation. The landscape approach involves the conservation of ecosystems of the Terai and Churia hills to ensure ecological, economic and socio-cultural integrity across multiple land uses (MoFSC, 2015; Acharya et al., 2019). These initiatives resulted in the growth of tiger populations in Nepal from 121 individuals in 2009 (Karki et al., 2009) to 198 in 2013 (Dhakal et al., 2014) and 355 in 2022 (DNPWC & DFSC, 2022). However, this conservation success has come at a cost. In Nepal, human casualties attributed to tigers have quadrupled from nine people/year during 2010–2014 (Acharya et al., 2016) to 36 people in the fiscal year 2021/2022 (DNPWC, 2022). In Bardia National Park in particular, the tiger population increased from 18 in 2009 (Karki et al., 2009) to 125 in 2022 (DNPWC & DFSC, 2022), and human casualties attributed to tigers increased from one person/year during 1994–2007 (Bhattarai & Fischer, 2014) to 18 people in the fiscal year 2020/2021 (BNP, 2021). Various conflict reduction measures such as removal of tigers, compensation payments and livestock husbandry improvements have been implemented (Silwal et al., 2017; BNP, 2021; DNPWC, 2022), although these require regular review and improvement to reduce conflict further.

Chitwan National Park has the largest population of tigers in Nepal, with an increase from 91 in 2009 (Karki et al., 2009) to 128 in 2022 (DNPWC & DFSC, 2022). Incidents of human–tiger conflict are frequent in this Park (Silwal et al., 2017), with an increase in annual human casualties attributed to tigers from two to 10 during 2007–2014 (Dhungana et al., 2018) and the removal of 17 tigers involved in conflict during 2007–2016 (Lamichhane et al., 2017). Previous studies of human–tiger conflict in Chitwan National Park have mainly investigated conflict patterns (Silwal et al., 2017; Dhungana et al., 2018; Lamichhane et al., 2018), local attitudes towards tigers (Carter et al., 2014; Dhungana et al., 2022) and management approaches such as removal, compensation payments and electric fencing (Sapkota et al., 2014, Dhungana et al., 2016; Lamichhane et al., 2017). Given that conflict patterns tend to change over time and the success of conflict-mitigation measures depends largely on the support of key conservation stakeholders, understanding the perspectives of different stakeholders regarding conflict reduction measures is vital for successful management interventions (Treves et al., 2009). Information on the views of the various stakeholders regarding conflict reduction measures is lacking for Chitwan National Park (Silwal et al., 2017; Lamichhane et al., 2018).

We aimed to identify a set of potential measures to mitigate human–tiger conflict in and around Chitwan National Park and to assess the prioritization of potential conflict reduction measures amongst the various stakeholders (victims, tiger conservation beneficiaries and National Park managers). Our overall objective was to enhance the ability of managers to mitigate human–tiger conflict and conserve tigers. The identification of the priorities of stakeholders regarding adoption of conflict reduction measures has implications for human–tiger conflict mitigation in Chitwan National Park and in other areas with similar socio-ecological settings.

Study area

Chitwan National Park (Fig. 1), a UNESCO World Heritage Site, is the oldest protected area in Nepal and is home to globally threatened species including the tiger, Asian elephant *Elephas maximus*, gaur or Indian bison *Bos gaurus*, greater one-horned rhinoceros *Rhinoceros unicornis*, gharial *Gavialis gangeticus* and leopard *Panthera pardus*. The interior area of the National Park (952 km²) encompasses wooded sal *Shorea robusta*-dominated forest and riparian habitats supporting a mosaic of grasslands, wetlands and rivers. The 729 km² National Park buffer zone includes human settlements (nearly 70,000 households in 2011; CBS, 2012). The majority of inhabitants engage in farming and livestock husbandry. The buffer zone is one of the historical settlement areas of marginalized ethnic groups (e.g. *Bote*, *Majhi*, *Kumal* and *Tharu*), who are provided with regulated permission for fishing and other customary activities to preserve their Indigenous heritage and support their daily livelihoods (CNP, 2018). A total of 22 buffer zone user committees have been formed to provide regulated access to the resources available in the National Park and its buffer zone for the local communities, and to engage them in conservation activities. The tiger in Chitwan National Park is regarded as

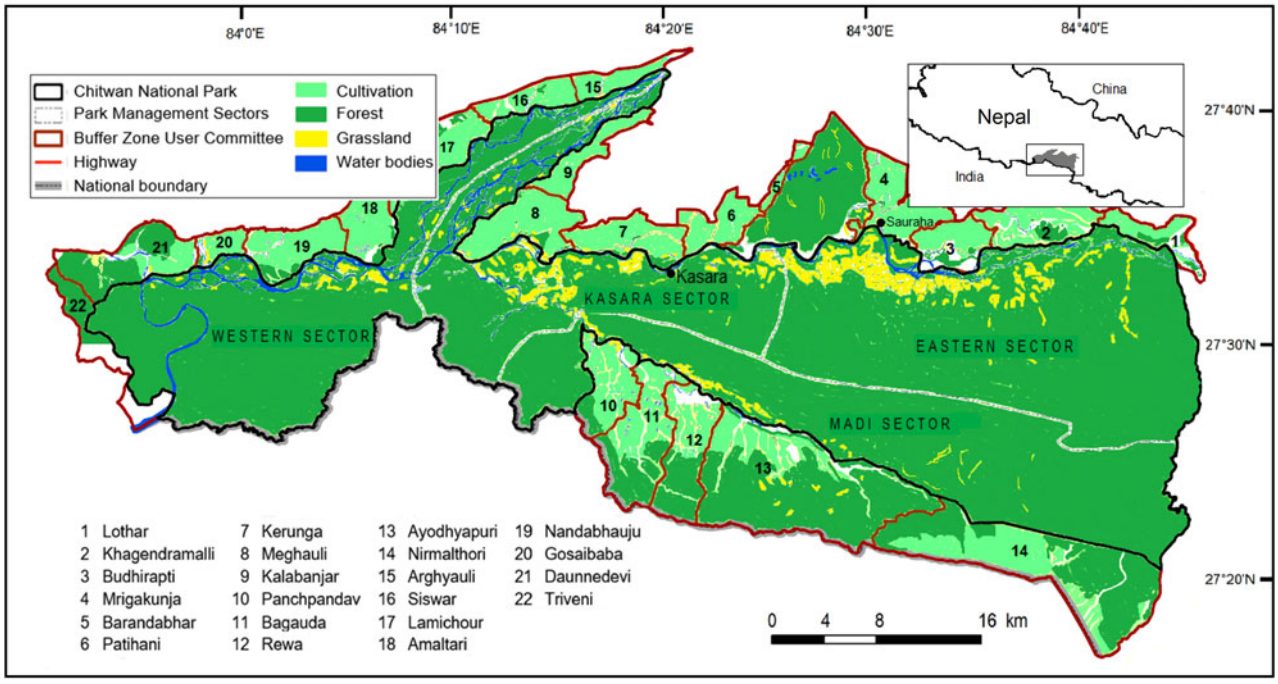

FIG. 1 Location of Chitwan National Park, Nepal, and its surrounding buffer zone, depicting land cover, the four management sectors (units) and 22 buffer zone user committees. (Readers of the printed journal are referred to the online article for a colour version of this figure.)

the source population for the surrounding areas in Nepal and areas bordering India (Silwal et al., 2017).

Methods

Identification of potential conflict reduction measures

We identified potential human–tiger conflict reduction measures through a review of the relevant literature (Barlow et al., 2010; Goodrich, 2010; Goodrich et al., 2011; Silwal et al., 2017), including journal articles, published and unpublished official documents and/or reports, and relevant web pages. We then refined the list of measures through 14 key informant interviews with officials of Chitwan National Park (5), the Department of National Parks and Wildlife Conservation (5) and representatives of buffer zone user committees (4) using a checklist and open-ended questions, in January 2022. Finally, we determined revised potential conflict reduction measures and then a subset identified as the most useful, through a workshop organized in Sauraha, near Chitwan National Park, in February 2022. The subset was then prioritized using a questionnaire survey after the workshop with a wider group of participants, in February 2022. We conducted all surveys and workshops in Nepali and obtained the prior informed consent of all respondents.

The workshop involved 46 conservation stakeholders in nine categories (Table 1): farmers, forest users, Indigenous groups (fishers), tourist guides, safari operators, tour and hotel operators, business operators, local NGOs and National Park officials. We selected participants to ensure equitable representation from all four National Park management units, to avoid potential bias. One participant from each of the two NGOs was invited, and for the remaining eight categories we requested that the respective association/network/organization send an equal number of participants from each of the four management units. The respective association/network/organization independently selected the representatives. We screened the participant list for any bias and found that all management units were represented except for the tour and business operator categories, for which no representation from one management unit (Madi) could be provided (because the nominated representative was absent). Because of resource constraints, we did not include other potential stakeholders such as journalists, civil society representatives, conservation partners or the general public.

Evaluation (prioritization) of conflict reduction measures

We initially identified 22 conflict reduction measures, which we categorized as preventative, mitigative or reactive (Goodrich, 2010). Through discussion in the workshop and by unanimous consent of participants, we identified a subset of nine potential measures from the initial 22: (1) compensation payments, (2) capture and translocation of

TABLE 1 Details of the various stakeholder groups who participated in the workshop for the identification of human–tiger *Panthera tigris* conflict reduction measures in Chitwan National Park, Nepal (Fig. 1).

Stakeholder group	Number of participants (n = 46)	Details of participants	Occupational category	Stakeholder group
Farmers	12	Livestock (cattle, buffalos, goats & pigs) farmers; crop (food & cash crops, vegetables & horticulture) farmers (commercial or subsistence)	Farmer	Victim of tiger conservation
Forest users	7	Primarily farmers representing community forest user committees in Chitwan National Park buffer zone; some also own private forests	Farmer	Victim of tiger conservation
Local Indigenous groups (fishers)	7	Members of *Bote*, *Darai*, *Kumal* & *Tharu* Indigenous groups, traditionally dependent on fishing & suffer nearly a third of wildlife attacks in Chitwan National Park (Silwal et al., 2017); only these groups are granted permits for fishing as per Chitwan National Park Regulation, 1974	Fisher	Victim of tiger conservation
Tourist guides	4	Members of tourist guide association; independent tourist guides	Tourism beneficiary	Beneficiary of tiger conservation
Safari operators	4	Members of the elephant safari or Jeep safari associations	Tourism beneficiary	Beneficiary of tiger conservation
Tour & hotel operators	3	Operators of tour & travel agencies; hotel owners	Tourism beneficiary	Beneficiary of tiger conservation
Business operators	3	Souvenir shop, grocery & dairy owners	Tourism beneficiary	Beneficiary of tiger conservation
Local NGOs	2	Official of the WWF–Nepal field unit; official of the National Trust for Nature Conservation field unit	National Park manager	Support managers of Chitwan National Park
National Park officials	4	Wardens, ranger & game scout of Chitwan National Park	National Park manager	Managers of Chitwan National Park

tigers involved in conflict, (3) monitoring and tracking of tigers, (4) deterring tigers from entering unsuitable habitats, (5) construction of tiger-proof fences around human settlements and farmlands, (6) habitat and tiger prey management, (7) improvement of livestock corrals, (8) avoidance of grazing in depredation hotspots, and (9) conservation education and awareness activities.

To investigate the priority of these nine measures amongst victims, beneficiaries and managers of tiger conservation, we categorized local stakeholders into four categories: (1) farmers and forest users, (2) fishers (local Indigenous groups), (3) tourism or conservation beneficiaries (including tourist guides, safari operators, tour and hotel operators and business operators), and (4) National Park managers (National Park and NGO officials). We regarded farmers, forest users and fishers as the primary victims of tiger conservation, tourism and business operators as the primary beneficiaries of tiger conservation, and the National Park officials as the tiger conservation managers.

We selected respondents for the questionnaire survey randomly from each of the four stakeholder categories, using a table of random numbers, and equally from amongst the four National Park management units. For farmers and forest users, we selected 45 households from each of the four management units using the household list available from the respective buffer zone user committee. If any selected household was not a farming household, we selected the next farmer household. Each respondent had to be older than 18 years and preferably the household head. For fishers, we selected 15 from each management unit using the fishers list available from the National Park office (the National Park maintains a register of people holding a fishing permit). For tourism beneficiaries, we surveyed two respondents from each association or network of six groups (tourist guide, elephant safari, Jeep safari, tour agency, hotel, shop) using the member lists of the respective association or network in the four management units. For National Park managers, the respondents comprised three National Park staff members from each management unit and one from an NGO. The questionnaires were completed in face-to-face interviews. In total, we surveyed 301 people (180 farmers, 60 fishers, 48 tourism beneficiaries and 13 National Park managers), from whom we received 281 completed questionnaires (93.4%; 197 men, 84 women) representing 168 farmers, 56 fishers, 44 tourism beneficiaries and 13 National Park managers.

In the questionnaire, respondents were required to rank each of the nine conflict-mitigating measures in order of priority on a scale of 1 (lowest priority) to 9 (highest priority)

for use in reducing conflict incidents. For each stakeholder group we calculated the score of each measure as (modified from Maraseni, 2008):

$$Overall\ score = \sum_{i=0,j=0}^{i=9,j=9} (W_i \times R_j)/N$$

where W_i is the number of respondents selecting a particular measure W ($i = 1$–9) corresponding to a particular rank R ($j = 1$–9), R_j is the assigned rank ($j = 1$–9) of a particular measure and N is the total number of respondents in the respective stakeholder group. The higher the overall score of a particular measure in a stakeholder group, the higher the rank of the corresponding measure in that group.

Results

Of the 22 potential conflict reduction measures identified, 12 were preventative, five reactive and five mitigative (Table 2). Priority of the nine measures that were identified in the workshop varied substantially between potential tiger victims, tourism beneficiaries and National Park managers (Fig. 2). Both farmer and fisher groups assigned the highest priority to the construction of tiger-proof fences around settlements and farmlands (electric, barbed or mesh wire) and the second highest to compensation payments. Farmers gave third priority to the improvement of livestock corrals, whereas fishers chose the enhancement of conservation awareness amongst communities. Beneficiaries of tiger conservation through tourism assigned the highest priority to habitat and prey management and selected compensation payments and conservation awareness as their second and third priorities, respectively. National Park managers assigned the highest priority to compensation payments, followed by habitat and prey management and then conservation awareness (Fig. 2). On average, compensation payments received the highest priority score (6.60), followed by tiger-proof fencing (6.39) and habitat and prey management (6.07).

Discussion

Human–tiger conflict reduction measures primarily involve the implementation of certain interventions to manage tigers, people or livestock. However, the feasibility of any measure depends on the magnitude, nature and extent of its impact, the characteristics of the species involved, the socio-ecological context and the availability of the resources necessary for implementation. This study identified a wide range of measures, from direct management of tigers, habitat and prey to infrastructure development, the regulation of people entering the Park and management of domesticated animals.

Over 50% of the conflict reduction measures identified in this study were preventative, indicating that the conservation

Table 2 The 22 potential human–tiger conflict reduction measures for Chitwan National Park, Nepal (Fig. 2). Asterisks (*) mark the nine measures identified by workshop participants as potentially being the most useful.

Preventative measures
(1) Zoning to regulate presence of people & livestock in tiger habitats
(2) Improve livestock corrals*
(3) Avoid livestock grazing in depredation hotspots*
(4) Replace unproductive livestock with a smaller number of improved breeds
(5) Promote stall feeding of livestock & avoid tethering outside corrals, particularly at night
(6) Research tigers, including conflict dynamics, food habits, habitat use & spatial distribution
(7) Manage habitat & tiger prey*
(8) Construct tiger-proof fences around settlements & farmlands*
(9) Install early-warning technology to provide information on potentially dangerous tigers
(10) Relocate settlements whenever acceptable to local people
(11) Raise conservation awareness amongst communities*
(12) Reduce injury to tigers by people

Reactive measures
(1) Capture, translocate & manage (including lethally) potentially dangerous tigers*
(2) Track & monitor tigers already or likely to be involved in conflict incidents*
(3) Deter tigers from settlements & farmlands using scare tactics (e.g. auditory, visual & material)*
(4) Provide emergency rescue & medical services to people in case of tiger attacks
(5) Strengthen the Rapid Response Team of Chitwan National Park

Mitigation measures
(1) Administer compensation payments for tiger attacks on people & livestock*
(2) Promote an insurance scheme by provisioning subsidized premiums for deprived households
(3) Provide scholarships to children of persons killed or permanently disabled in tiger attacks
(4) Provide job and livelihood opportunities to the families of individuals killed by tigers
(5) Improve the stewardship of local communities & local governments in conflict reduction

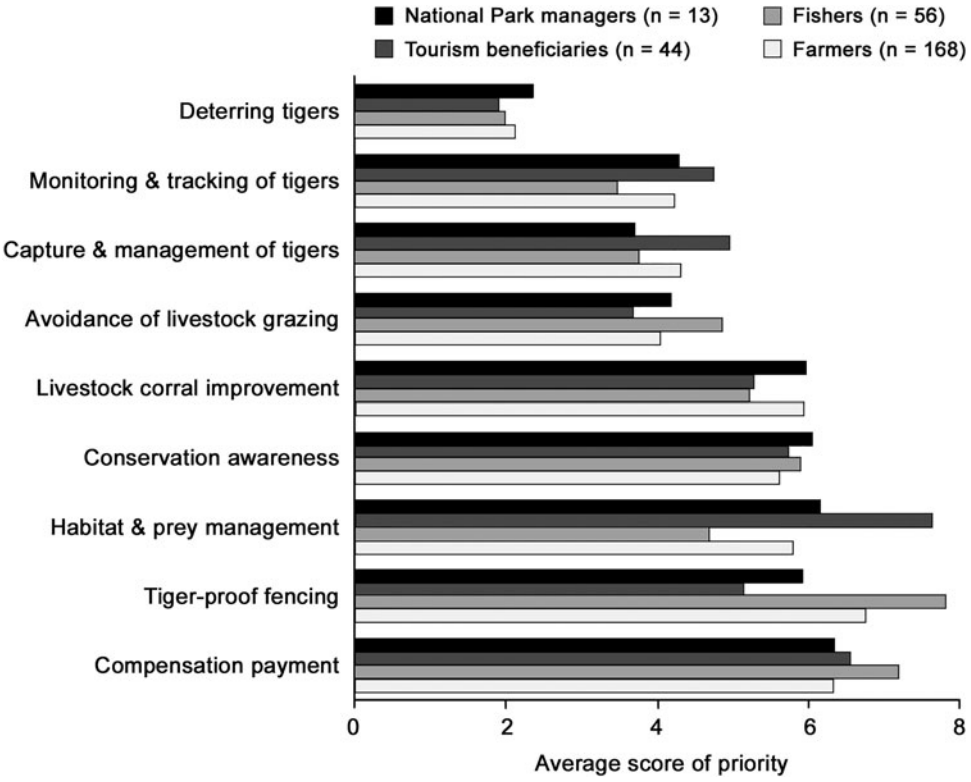

FIG. 2 Prioritization of the nine human–tiger conflict reduction measures (Table 2) by four groups of stakeholders (Table 1) in Chitwan National Park, Nepal, identified using questionnaire surveys. The score of each measure on a scale of 1–9 indicates its priority within the corresponding stakeholder category; the higher the score, the higher its priority (see text for details).

stakeholders prefer to solve problems before they arise. Such an approach is encouraged, to reduce conflict incidents (Goodrich, 2010). The measures identified in our study also include both hard measures (e.g. lethal control of tigers and relocation of villages) and soft measures (e.g. habitat management and conservation awareness). Although the hard measures could have immediate effect, such measures should be employed only when absolutely necessary, considering their ethical, political, socio-economic and ecological ramifications. Soft measures may take more time to produce a favourable outcome but are perhaps best from the viewpoint of applicability and sustainability. We therefore recommend a combination of measures, to enhance their overall efficiency and effectiveness.

However, our study did not identify some previously reported measures, including the use of guard dogs (Khan, 2009), wearing masks and fibreglass headgear, erecting electrified dummies, dredging water channels, digging freshwater ponds (Rishi, 1988; Barlow et al., 2010) and aversive geofencing technologies (Wall et al., 2014). Such measures require further testing and evaluation before they can be considered feasible for use in Chitwan National Park.

Prioritization of potential conflict reduction measures is important because of the scarcity of resources and differences in preference amongst stakeholders. We found the various conservation stakeholders had differing priorities for conflict reduction measures (Fig. 2). The primary victims of tiger attacks preferred the construction of tiger-proof fences, whereas the beneficiary groups preferred habitat and prey management, and National Park managers preferred compensation payments. Compensation payments were the only measure in the top three priorities of all four stakeholder groups. The preference of potential victims for tiger-proof fencing over the other measures indicates the desire of this group to avoid tiger attacks rather than to receive compensation for attacks after they occur.

Unlike other preventative measures such as prey management, victims could have perceived tiger-proof fencing to provide immediate and effective protection against tigers. However, this measure was not amongst the top three priorities for the beneficiary groups and National Park managers, perhaps because these stakeholders are unsure of its effectiveness, perceive that it could disrupt tiger dispersal, or are familiar with the high costs of fence installation and ongoing maintenance (Sapkota et al., 2014; Lamichhane et al., 2017). A study on the efficacy of electric fencing from the eastern sector of Chitwan National Park, where the Asian elephant, greater one-horned rhinoceros, wild boar *Sus scrofa* and tiger were the main species involved in conflict incidents, reported a reduction in livestock losses of only 30–60% after implementing fencing (Sapkota et al., 2014). As knowledge of the effectiveness of fences for mitigating conflict with tigers appears to be limited, we suggest undertaking pilot studies to evaluate the effectiveness of such structures before any widespread implementation.

An emerging alternative measure to conventional fencing is aversive geofencing technology. This involves capturing an animal, fitting it with an aversive geofencing device, releasing it, and creating virtual fence lines around areas such as farmlands. If the animal approaches the virtual fence, it is repelled by an automated audio warning or a mild electric shock. This technology has been used to limit conflicts with the African elephant *Loxodonta africana* in Kenya (Wall et al., 2014) and Asian elephant in Sri Lanka (Cabral de Mel et al., 2022), has been trialled with success on lions *Panthera leo* in Botswana (Weise et al., 2019) and is being deployed on dingoes *Canis familiaris* in Australia (B. Allen, pers. comm, July 2022). Because of its lower cost compared to physical fencing structures (Wall et al., 2014) and the proportion of problem animals being small (e.g. $< 5\%$ of tigers in Chitwan National Park; Lamichhane et al., 2017), this approach could potentially revolutionize tiger conflict management in key situations. We recommend trialling this technology in Chitwan National Park on tigers involved in conflict and perhaps also on other species.

The habitat and prey management measure received the highest priority amongst tourism beneficiaries and also ranked second highest amongst National Park managers (Fig. 2). Globally, the management of grassland, forest and wetland habitats is a commonly recommended preventative measures to reduce incidents of human–carnivore conflict (Goodrich, 2010). Such habitat management programmes aim to increase wild prey densities and the carrying capacity of protected areas for predators, thus reducing the likelihood of predators roaming beyond the protected area. As habitat management interventions in Chitwan National Park are mainly concentrated inside the Park, expansion of such activities to community forests and other forested areas outside the National Park has been encouraged (CNP, 2018). The prey density in Chitwan National Park and the surrounding areas is 100 animals/km^2 (DNPWC & DFSC, 2022). Prey populations could be further augmented by reintroducing prey species such as the swamp deer *Cervus duvaucelii*, wild water buffalo *Bubalus arnee* and blackbuck *Antilope cervicapra* from other areas in Nepal, and by reducing poaching of prey and their killing by feral or stray domestic dogs. Such prey augmentation programmes should, however, also consider the potential for associated crop damage on local farms.

National Park managers gave the highest priority to compensation payments, which was also the second most preferred measure amongst farmers, fishers and tourism beneficiaries (Fig. 2). A preference for this measure could be attributed to the feasibility of implementation and because it directly supports the victim or their dependents. We recommend further studies to determine whether there are any additional reasons for the prioritization of this measure. Compensation payments aim to succeed by developing community tolerance towards wildlife, by alleviating impacts rather than by reducing conflict incidents (Goodrich, 2010), so implementation of this measure alone should not be encouraged. A better approach may be to focus on preventative measures to avoid the occurrence of conflict incidents. Compensation payment measures have been adopted globally yet are controversial (Karanth et al., 2018). Proponents argue that compensation enhances community tolerance and ownership and decreases retaliatory killings of wildlife (Agarwala et al., 2010; Persson et al., 2015), but opponents claim it is subject to fraud and is non-transparent, inadequate and bureaucratic, and time-consuming to implement (Ogra & Badola, 2008; Watve et al., 2016). Putting an economic value on human life is also ethically problematic (Shilongo et al., 2018). The creation of an insurance scheme is also an option because of the increasing financial liabilities and the priorities of Nepal for physical infrastructure and economic development rather than wildlife conservation (Aryal et al., 2021). Despite these issues, considering the prioritization of this measure by several stakeholder groups and the absence of any indication of fraud or misappropriation of compensation payments in the study area (Dhungana et al., 2016), we recommend that the current compensation payment scheme continues alongside the other prioritized preventative and reactive measures that we identified.

The differences in priorities that we documented between groups of stakeholders could have resulted from variation in the costs and benefits of different measures and in the roles and responsibilities amongst these stakeholders in tiger conservation and any previous experiences with tigers. Considering the discrepancies in priorities between stakeholder groups, we recommend that National Park managers take a leadership role in mediating the different priorities amongst stakeholders when selecting conflict reduction measures. Differences could be addressed through minimization of the costs of conflict on affected communities, sharing conservation benefits amongst affected communities, the optimal and equitable allocation of available resources, the involvement of the private sector in conflict reduction, and the strengthening of trust and cooperation amongst all stakeholders. Implementing the measures we identified in this research in and around Chitwan National Park could address human–tiger conflicts sustainably in ways that benefit both people and tigers.

Author contributions Study conception and design: all authors; material preparation, fieldwork, analysis: RD, TM, GP, RR; writing: RD; revision: all authors.

Acknowledgements We thank The Rufford Foundation (28875-B) for financial support and the Department of National Parks and Wildlife Conservation and Chitwan National Park staff, Prakash Upreti, field assistants and community members for their help in data collection and stakeholder consultations.

Conflicts of interest None.

Ethical standards This work abided by the *Oryx* guidelines on ethical standards and complied with the ethical code of conduct of the Department of National Parks and Wildlife Conservation (Ref. no. 076/77 Eco 60, 1767) and Chitwan National Park, which provided the permit for this research.

Data availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

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