Global Ecology and Conservation 22 (2020) e00936

Contents lists available at ScienceDirect

Global Ecology and Conservation

journal homepage: http://www.elsevier.com/locate/gecco

Original Research Article

Conservation opportunities and challenges emerge from assessing nuanced stakeholder attitudes towards the Asian elephant in tea estates of Assam, Northeast India

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ARTICLE INFO

Article history:
Received 18 April 2019
Received in revised form 20 January 2020
Accepted 20 January 2020

Keywords:
Elephas maximus
Human–wildlife interactions
Landscape-scale conservation
Perspectives
Production landscapes
Stakeholder engagement

ABSTRACT

Interactions between wildlife and people lie at the core of conservation planning in heterogeneous landscapes. Understanding stakeholder perspectives towards wildlife is a key endeavour in this regard. In particular, it can be useful to separate notional or generic attitudes towards wildlife, from those that pertain to more practical considerations at localised scales. We assessed nuances in stakeholder attitudes and underlying beliefs towards the endangered Asian elephant *Elephas maximus*––a wide-ranging species that needs landscape-scale conservation, while also being an animal that is both culturally revered and conflict-prone. We instrumented semi-structured questionnaire surveys using a 5-point Likert score, to 2252 respondents representing tea estate labour and management across 17 estates in the Kaziranga–Karbi Anglong landscape of Assam, Northeast India. Respondents were overwhelmingly positive (80–98%) towards elephants notionally. In our landscape, this stemmed more from cultural links and beliefs about the animal's intrinsic right to persist, rather than utilitarian benefits in terms of ecosystem health. At localised scales, responses were more varied with issues relating to safety concerns and crop loss maximally inciting non-positive responses. Similarly, stakeholder attitudes towards elephant conservation at localised scales were varied. Elephant use of lands outside forests, for instance, incited equivocal responses. Interestingly, while safety concerns clearly limit the potential for human–elephant co-occurrence, stakeholders still believed that elephants do not harm people unprovoked; this highlights the opportunities a culture of tolerance provides for stakeholder support of, and engagement with, wildlife conservation. Ultimately, understanding stakeholder attitudes can determine our ability to encourage 'wildlife-friendly' behavioural change and shape human–wildlife interactions into the future.

1. Introduction

Conservation at the scale of large heterogeneous landscapes typically involves multiple objectives, opportunities and challenges (Sayer et al., 2013; Game et al., 2014). At these scales, fundamental to conservation are often spaces shared

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https://doi.org/10.1016/j.gecco.2020.e00936

between wildlife and people, and interactions, positive or negative, between them (Driscoll et al., 2013; Sayer et al., 2013). Indeed, it can be argued that it is probably at these scales that stakeholder engagement is most critical to conservation efforts (Sayer et al., 2013; Bennett et al., 2017). Fostering support from stakeholders helps sustain conservation benefits into the long term (Bennett et al., 2017). Further, understanding stakeholder attitudes towards focal taxa or conservation programs can predict people's behaviour in response to wildlife, help better implement conservation activities, identify gaps in existing efforts, shed light on obstacles to conservation, and can ultimately aid in achieving long-term conservation goals (Treves et al., 2013; Bennett et al., 2017).

There is much utility in expressing stakeholder support as a simple metric of the proportion of surveyed stakeholders who report positive responses to conservation. Such a metric of stakeholder attitudes is useful for comparisons across space, time, species or other covariates of interest (e.g., Treves et al., 2013; Kansky et al., 2014; Piédallu et al., 2016). Here, each stakeholder is either considered as 'positive' towards wildlife or 'not-positive' in a simple binary assignment. Yet, it is well understood that people's attitudes can often be more nuanced than what can be expressed in the above binary form (Fulton et al., 1996; Kansky et al., 2016). For instance, stakeholders in a landscape could be positive about the intrinsic value of animals or forests, but may not show the same positivity about their ecological function (García-Amado et al., 2013). These attitudinal differences can reflect the underlying values or beliefs that shape a person's attitude towards wildlife (Fulton et al., 1996), and can be translated to their *motivations* for supporting nature conservation (Bjerke and Kaltenborn, 1999; García-Amado et al., 2013).

Importantly, delving into nuances in attitudes towards species and their conservation can provide insights useful for participatory conservation, particularly in the light of human–wildlife interactions (Treves et al., 2013; Kansky et al., 2016). Stakeholders may notionally be positive even towards wildlife that cause them financial losses (Kansky et al., 2014). In more practical terms however, wherein wildlife presence or conservation actions may relate to restriction of land-use, financial losses or other impacts, positive attitudes may wane (Røskaft et al., 2007; Andrade and Rhodes, 2012; Treves et al., 2013; Amit and Jacobson, 2017). Røskaft et al. (2007), for instance, found that people agreed that carnivores had a right to survive in Norway, but that positivity reduced in the context of carnivore population management or their presence near human-use lands. Indeed, in our focal landscape in Northeast India, we found that the proportion of respondents that were positive towards elephants and their conservation reduced by half when moving from conservation in generic terms, to more practical, localised issues. Past research too, has shown that people tend to respond on a more emotional level when speaking notionally, whereas responses are more logical when speaking to subjects that impact them directly (Stevenson et al., 2015). These two categories of notional and localised attitudes loosely align to eco-centric (or biocentric or intrinsic) and anthropocentric (or utilitarian or materialistic or instrumental) perspectives to wildlife, respectively (Justus et al., 2009); yet their implied values are different, and hence, we retain the categorisation of notional versus practical.

The Asian elephant *Elephas maximus* evokes a complexity of attitudes, conjuring images of a revered deity, and simultaneously, an animal that poses a threat to people's lives and livelihoods (Sukumar, 2003; Barua, 2010; Locke and Buckingham, 2016). The Asian elephant is a wide-ranging species, necessitating a landscape-scale approach that comes with multiple, sometimes conflicting, conservation objectives (Leimgruber et al., 2003; Goswami and Vasudev, 2017). More than half of the remnant range of the species is fragmented, putting it in direct contact with people (Leimgruber et al., 2003). Living alongside elephants can impose a variety of costs upon local people, including loss of crops, damage to property, and safety risks (Dickman, 2010). At the same time, elephants can face reduced viability and impeded connectivity across fragmented, human-dominated landscapes (Goswami et al., 2014; Goswami and Vasudev, 2017). As a consequence, human–elephant conflict is of conservation concern across most of the species' range (Fernando et al., 2005; Webber et al., 2011). With more than 70% of Elephant Reserves in India comprising multiple-use and private lands outside government-managed Protected Areas (MoEF, 2010), these challenges are widespread and pronounced in the country. Assessing stakeholder attitudes toward elephants and their conservation, as a foundation for informed stakeholder engagement in conservation efforts, is thus a timely need for this endangered species.

Here, we assess the complexity of stakeholder attitudes and underlying beliefs toward the Asian elephant in tea estates situated in the Kaziranga–Karbi Anglong Elephant Reserve, an important conservation landscape in Assam, Northeast India. We explored perspectives towards elephants from various angles, largely grouped as those that are notional, and local-scale attitudes that link directly to the respondents' well-being. We then explored stakeholder perspectives to conservation at three scales, namely the global, regional and landscape scale; the first two scales aligning with notional ideas of conservation, and the latter with practical, tangible conservation action. We discuss the relevance of our findings for the conservation of a species that rouses multiple emotions among stakeholders who are invested in, or impacted by, its conservation. Our aim here was to explore differences, not across respondents, but across perspectives pertinent to elephants and their conservation.

2. Materials and methods

2.1. Study area

The Kaziranga–Karbi Anglong Elephant Reserve, spanning 3270 km^2 and located in Assam, Northeast India, is a unique floodplain ecosystem comprising grasslands, forests and human-inhabited lands. The Reserve is arguably one of the most viable landscapes for the Asian elephant in the region, estimated to hold more than 1700 elephants (Goswami et al., 2019). At the core of the landscape is the Kaziranga National Park, a biodiverse Park comprising grasslands, and mixed deciduous and

semi-evergreen forests, that is enriched by seasonal flooding of the Brahmaputra River. To the south, and separated by agricultural lands and tea estates, are the forested hills of Karbi Anglong (Yadava, 2015).

Annually, when the Brahmaputra inundates Kaziranga, wild animals, including elephants, hog deer *Axis porcinus*, and the greater one-horned rhinoceros *Rhinoceros unicornis*, move southwards to access the higher reaches of tea estates and the hills of Karbi Anglong. While such animals move through demarcated government-managed corridors, they also access the highlands through agricultural lands and tea estates that lie between Kaziranga and Karbi Anglong. The tea estates not only act as movement conduits, they also serve as secondary habitat, buffering less secure forests of the landscape (Vasudev et al., 2015). At the same time, elephant presence in the estates can be a cause for consternation among stakeholders and potential human–elephant conflict. Our survey spanned 17 tea estates in the landscape, which included: Abhoyjan, Bogidhola, Borsapori, Burapahar, Diffloo, Dolaguri, Hathikuli, Jagadamba, Kathoni, Marangi, Methoni, Murphulani, Nahorbari, Numalighur, Rungajaun, Seconee and Shyamraipore Tea Estates (Fig. 1).

2.2. Questionnaire surveys

People's attitudes were assessed through a structured questionnaire survey, comprising multiple statements that respondents scored on a Likert scale (Likert, 1932). We instrumented the questionnaire surveys between November 2015 and January 2017 across 17 tea estates in the focal landscape. Estates were chosen based on their location within the Reserve, their proximity to Kaziranga or other forest patches in the landscape, and the willingness of the management to participate in our survey.

In each estate, trained field persons approached three tiers of tea estate staff, namely the management, labour unions—representative units of labour in each tea estate—and labour staff, or staff of the estates who are involved in physical tasks such as plucking tea leaves, pruning and fertilization. We targeted 120 respondents per estate, approximately comprising men and women equally, so as to be representative of all persons working in the estates. Trained teams chose respondents opportunistically.

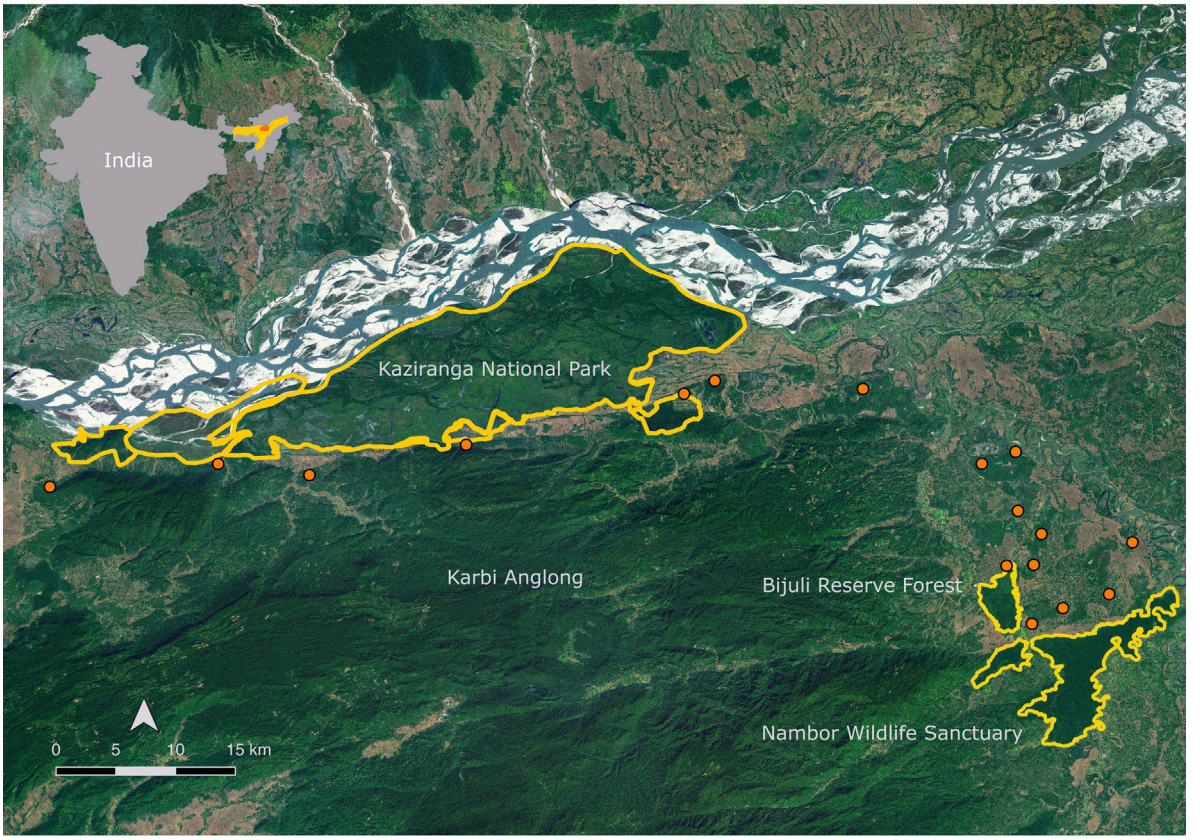

Fig. 1. Map of the landscape showing Kaziranga National Park, the forests of Karbi Anglong, and other protected forests, with dark green patches representing forests. We also show as orange dots, the 17 tea estates where we conducted our survey. Inset shows location of our project area within India. (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

For each respondent, we first obtained oral consent, upon explaining the aim of our survey. We then instrumented the survey, approved by our institutional Human Subjects Ethics Committee, in English, Hindi, or one of the two local languages, Baganiya or Assamese, as per the respondent's convenience. Through the questionnaire, we recorded: (1) background information on the respondent, (2) a history of conflict exposure of the respondent and their family, (3) attitudes of the respondent towards elephants, and (4) attitudes towards elephant conservation. Responses for attitudes were recorded on a 5-point Likert scale that ranged from Strongly Disagree through Neutral to Strongly Agree. The list of statements for scoring attitudes is presented in Table 1.

2.3. Analyses

We assessed statements based on three categories (Fig. S1). First, we assessed people's attitudes in generic or notional terms towards elephants. Since these attitudes could potentially arise from multiple values, we inferentially clubbed notional attitudes into five groups: (1) intrinsic, relating to the belief that animals have an intrinsic right to life and existence; (2) traditional links to elephants that span from historical relationships; (3) regional pride, which relates to pride in the respondents' region being home to elephants; (4) empathy or thoughts on the *character* of elephants; and (5) concerns stemming from global conservation requirements of elephants.

We then assessed people's local-scale attitudes, or those relating more to a practical level and to aspects that directly impact them. There are three major ways elephants impact people, namely through (1) improving ecosystem health, (2) causing financial loss due to crop raiding or damage to property, and (3) safety concerns relating to a risk of human injury or loss of life. We note that certain questions had multiple inferential bases, as noted in Table 1 and Fig. S1.

Finally, we assessed people's attitudes towards elephant conservation at (1) a global scale, relating to range-wide elephant conservation, (2) a regional scale, relating to elephant conservation in the respondent's region (here, their district), and (3) landscape scale, relating to a finer scale discussion of elephant use of conservation landscapes such as the one the tea estate is situated within. It could be inferred that the first two of these scales relate to a more notional view on conservation, while that at the latter, or the landscape-scale, has direct ramifications for respondents. We note that the above framework (Fig. S1) was used for inferential purposes, but not included in any quantitative analyses.

For each statement or question, respondents could provide one of five responses, namely, Strongly Disagree, Disagree, Neutral, Agree, or Strongly Agree, akin to a Likert scale. We tabled the proportion of responses in each of the above five categories simply as the number of respondents professing each of these responses, divided by the total number of responses. We made these calculations separately for each question. We depicted these proportions as bar graphs. Our interest was in examining if there was variation in statements regarding overall positive or non-positive responses. We did so by comparison

Table 1
List of questions used, inference gained and assigned question codes.

Code	Inference[a]	Question
Intrinsic right	In, Tr	Elephants have a right to live in Assam.
Historical presence	In, Tr	Elephants are important because they have lived with us for hundreds of years.
Forest protection	Re, Ec	Elephants are important because they help to protect the forests of Assam
Knowledge of existence	Re	Although I have never seen wild elephants, it is important to know that they live in the forest near my home.
Existence in district	Re	Elephants should continue to live in my district in the years to come.
Intelligent animals	Em	Elephants are intelligent animals.
Dangerous beasts	Em, Sa	Elephants are dangerous beasts.
Unprovoked harm	Em, Sa	Elephants do not harm us if we do not harm them.
Enjoy watching	Em	I enjoy watching elephants in our tea estate.
Presence in tea estate	Em	I am happy with elephants in our tea estate.
Endangered status	Co, G	Elephants protection is important because they are highly endangered.
Deny crops	Cr	Elephants deny us our crops.
Unable to sustain family	Cr	I am unable to sustain my family because elephants damage my crops or property.
Growing menace	Cr	Depredation and property damage by elephants is a growing menace to life or property.
Restrict use	Sa	Elephants restrict how we use our land.
Safety threat	Sa	Elephants living nearby are a threat to the safety of my family.
Comfortable around elephants	Sa	I am comfortable visiting forests that have elephants.
Sudden encounters	Sa	Sudden encounters with elephants are a major concern.
Forest health	Ec	Elephants are important because they keep the forest healthy.
District numbers	R	There should be fewer elephants in my district in future.
District presence	R	Elephants should continue to live in my district in the years to come.
Local extinction	R	I would be happier if there were no elephants in my district.
Restricted to forest	L	Elephants should be restricted to forest reserves.
Encounters less	L	I encounter elephants less frequently in forest than I used to.
Forest loss	L	Elephants are entering tea estates because their forests are being lost.
Local tolerance	L	I cannot tolerate elephants in our tea estates.
Presence in tea estates	L	I am happy with elephant presence in our tea estates.

[a] In: Intrinsic Value; Tr: Traditional Links; Re: Regional Pride; Em: Empathy; Co: Conservation status; Ec: Ecosystem Health; Cr: Crop Raiding; Sa: Safety Concerns; G: Global Conservation; R: Regional Conservation; L: Landscape-scale Conservation.

of the above-mentioned table of proportions. Our questionnaire comprised statements that were both positive and non-positive towards elephants; for convenience, we transformed the Likert scores such that responses to all statements fell along a scale of being strongly positive through neutral to strongly negative towards elephants. We note that this depiction is purely for visualization purposes and in some cases, does not seamlessly or unambiguously translate to what is positive or non-positive with respect to elephant conservation. For instance, we retained this scoring of positive and negative even for the statement "sudden encounters with elephants are a major concern", while asserting that such concerns, where they exist, need to necessarily be encompassed within conservation efforts; we do so with the justification that these safety concerns may detract from overall conservation support for elephants and hence impact elephant conservation negatively.

While our main objective was to examine nuances in attitudes towards elephants, we did look at whether these varied across respondents as well. We focused on three respondent-specific characteristics. First, we looked at differences across gender. Second, we examined differences in attitudes based on the respondent role in tea estates, namely, whether they were a part of the labour staff, the labour union or the management; the role of respondents also influences how they interact with elephants in their work space. Third, we looked at differences across estates, which may arise due to the location of the tea estate——and hence exposure to human–elephant interactions——or due to management actions that are usually implemented at the scale of an entire tea estate. For the former, we assessed differences for all questions, while for the latter, that is, differences across estates (which numbered 17), we assessed differences for a select set of six representative questions for maximum tractability of results.

To further examine if there were some statements in particular that evoked strong responses—positive or negative—from respondents, we rescored responses such that they lay on a 3-point scale representing a neutral, weak (positive or negative) or strong response. We compared the proportion of strong responses across questions.

3. Results

3.1. Effort

In total, we interviewed 2252 respondents across 17 tea estates in the Kaziranga–Karbi Anglong landscape, with 27 questions pertinent to elephant ecology, behaviour and conservation. Respondents were representative of tea estate management ($n = 61$), labour unions or representative bodies ($n = 123$) and labour ($n = 2068$); the skewed proportions are reflective of the expected fact that estates have a significantly larger number of workers in the field (i.e., the labour) relative to the management. We ensured approximately equal representation of men (53%) and women (47%) in our pool of respondents.

3.2. Positive attitudes towards elephants

Respondents were overwhelmingly positive towards elephants notionally, with the proportion of respondents reporting positive scores ranging from 0.80 (on whether elephants were [not] dangerous beasts) to 0.98 (knowledge of elephant persistence in nearby forests). The proportion of respondents reporting strongly positive scores ranged from 0.52 (presence in tea estates) to 0.81 (intelligence of elephants; Fig. 2). This proportion did not vary much across different perspective groups, though it can be seen that there is a strong positive sense that elephants have an intrinsic right to live, while there is less of a strong positive response regarding elephant conservation concerns.

The statements that led to relatively lower positive responses were those relating to elephant contribution to forest protection, and their danger to people. Respondents, in addition to the statements mentioned above, strongly expressed (proportion of strongly positive responses > 0.75) their affirmation that it was important to know of elephant presence in forests near their home, and that harm to people is not unprovoked. Further, they generally reported (proportion of positive responses > 0.90, and in addition to statements referred to above) that elephants had a right to live in part due to their historical presence, and because the stakeholders enjoy watching elephants.

3.3. Practical challenges to living with elephants

Clearly practical challenges restricted positive attitudes towards elephants, with the proportion of positive responses being 0.37 with respect to statements on crop raiding by elephants and 0.42 on statements relating to human safety in the light of elephant presence. Around half (48.24%) of the respondents of our survey had faced some level of crop loss or property damage from elephants. An additional 38.83% reported crop loss or property damage faced by others in their village. Around 7% of respondents were from a family that had faced injury or loss of life as a result of human–elephant conflict, while an additional 31.82% knew of someone who had been thus affected. The proportion of respondents who agreed with positive benefits to ecosystem health by elephants was 0.78.

The proportion of positive responses to statements varied much more widely, from 0.02 (sudden encounters with elephants being a concern) to 0.91 (inflicting unprovoked harm; Fig. 3). Statements that evoked positive responses (proportion > 0.7) also included the dangerous nature of elephants, ecosystem health, and forest protection. Between 0.09% (concern from sudden encounters) and 75.8% (unprovoked harm) of respondents reported strongly positive attitudes. In addition, elephants posing a safety threat, being comfortable around elephants, crop denial and restriction of land-use elicited particularly low strong positive responses (proportion of strong positive < 0.2).

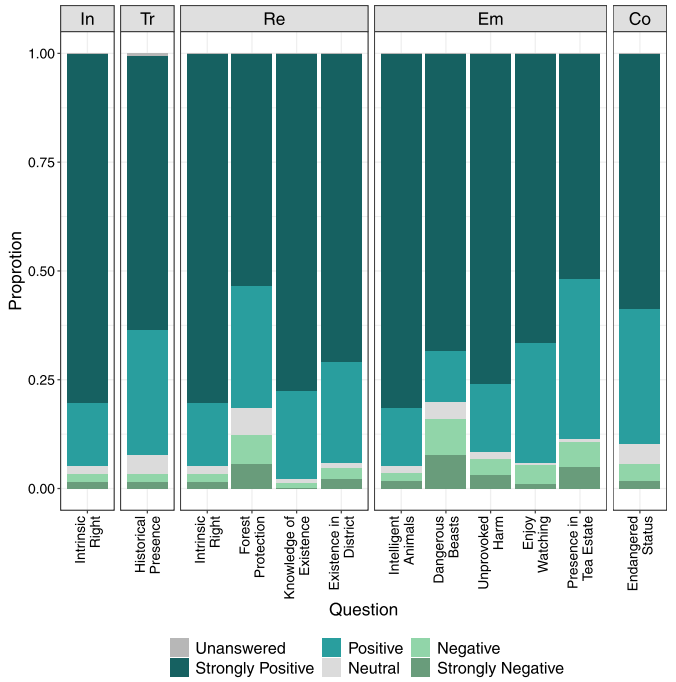

Fig. 2. Respondents largely reported positive attitudes towards elephants notionally, in terms of their intrinsic right to survive (In), traditional values (Tr), regional pride (Re), empathy (Em) and conservation concerns (Co).

We note that though people reported strong concerns for safety from elephants—indeed, it was these statements that evoked the strongest negative responses—people still did not attribute elephants with inflicting unprovoked harm, or the label of 'dangerous beasts.' Unlike the notional attitudes, there was consonance between the proportion of positive and strongly positive responses across questions; for notional attitudes, this was not the case (Figs. 2 and 3).

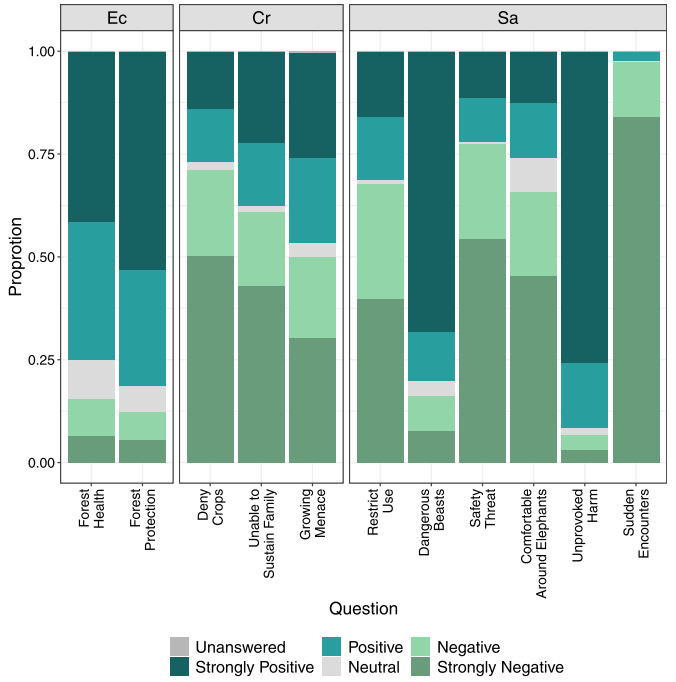

Fig. 3. Responses to practical concerns showed that there are multiple challenges to elephant conservation, particularly related to crop raiding (Cr) and safety risks (Sa), while people were conflicted about the ecosystem benefits (Ec) of elephants.

3.4. Attitudes towards elephant conservation

At the global level, nearly 90% of respondents felt that elephant conservation is important due to its endangered status, with more than half of the respondents feeling strongly so (Fig. 4). At the regional level of the respondent's district, people in general felt that continued presence of elephants was important (proportion of positive responses = 0.94 and 0.87), but did not share the same attitude regarding increased numbers of elephants (proportion of positive responses = 0.29).

At the landscape-scale, people were equivocal about whether elephant numbers were decreasing (proportion of positive responses = 0.59). In general, however, there was agreement that elephants were entering tea estates more frequently due to the loss of forests, with more than 90% of respondents agreeing to this statement; this points to an acknowledgement of forest loss in the landscape. While people were agreeable to elephant presence in tea estates (proportion = 0.73 and 0.89), more than half (57.5%) did consider that elephants should be restricted to forest reserves (Fig. 4); this likely relates to safety concerns people face with elephant presence (Fig. 3).

3.5. Variation across respondents

Interestingly, there were few differences across gender in terms of their attitudes towards elephants or their conservation (Fig. S2). Managers, labour union members and labour staff differed relatively more in their views (Fig. S3). Managers felt to a larger extent (15% more than average) that elephants had a right to live in Assam, but also disagreed more (16% compared to 6–7% of labour staff or union members) with the general perception that elephants do not harm people unless harmed. Overall, there was still overwhelming support for elephant use of tea estates, ranging from 77% from the management to 89% from the labour staff. Attitudes varied across tea estates considerably, amongst the six questions we selected, representing notional attitudes, practical concerns and conservation perspectives towards elephants (Fig. S4). The difference between estates with respect to the percentage of respondents sharing a particular view on a question was as much as 47%, with a minimum of 36% respondents and a maximum of 83% respondents per estate strongly agreeing that elephant protection is important due to their endangered status. Overall, however, generalities were still evident: sudden encounters, for instance, were a concern across all estates.

3.6. Definitive attitudes towards both notional and practical issues

The statements that garnered strong (negative or positive) responses from respondents (proportion > 0.75) unsurprisingly included those related to: (a) safety concerns; (b) elephant character in terms of their intelligence and proclivity to inflict unprovoked harm; and (c) conservation in terms of forest loss and their intrinsic right to persist in the region. On the other

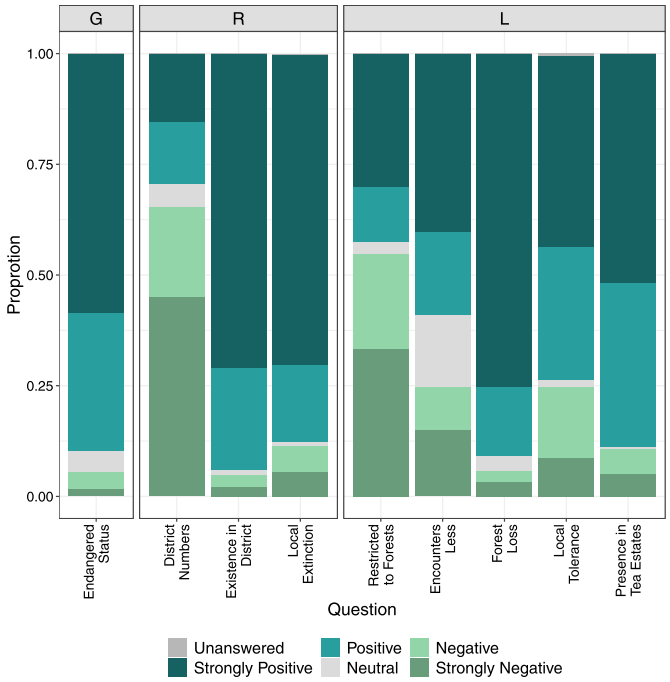

Fig. 4. Attitudes of tea estate staff towards global (G), regional (R) and landscape-scale (L) conservation of the Asian elephant.

hand, tempered responses (proportion of strong responses < 0.6) were provided to elephant presence in tea estates; links to forest health; and crop depredation and change in use of lands being a growing issue.

4. Discussion

High levels of support for wildlife amongst local communities, even for species that may cause financial loss or harm, have been previously recorded (Kansky et al., 2014). Our study is in consonance with this finding, where notionally, nine out of ten stakeholders supported elephant conservation, while nearly all respondents felt it important that elephants persist into the future. This positive attitude seemed to emerge from the relatively intangible links of culture, regional pride and a belief in intrinsic rights, rather than a more utilitarian notion that elephants may bring tangible benefits to people (Figs. 2 and 3). The debate on whether conservation should be backed by intrinsic or utilitarian (or instrumental) values is long-standing (Justus et al., 2009; Schröter et al., 2014; Vucetich et al., 2015). Part of the debate has revolved around the practical utility of intrinsic values attached to wildlife, towards achieving conservation (Schröter et al., 2014; Vucetich et al., 2015). Our findings provide reason to believe that intrinsic values of elephants are pivotal to sustaining stakeholder support for an otherwise conflict-prone species.

A perception of risk associated with sudden encounters with elephants clearly represents a sizeable challenge to conserving the species in human-dominated landscapes. While crop loss is the primary cause for conflict with other stakeholder groups involved in agriculture (e.g., Goswami et al., 2015), it is less of a driver of human–elephant conflict in tea estates––elephants do not forage on the tea plant *Camellia sinensis*, nor do they damage the crop in any substantial manner during their passage through tea estates. The same may hold true for other cash crops that are less palatable to wild herbivores such as elephants. People's responses in our survey corroborate this expectation, with safety risks associated with elephant presence emerging as a primary source of concern among stakeholders in the tea estates (Fig. 3). We note that stakeholders in our case also cultivate some amount of paddy––in low-lying areas that are unsuitable for the tea plant––and negative attitudes towards elephants vis-à-vis crop raiding stemmed from the losses people face with respect to this food crop. Notwithstanding these losses, efforts that aim to minimise safety risks to stakeholders in landscapes where cash crops such as tea are a dominant land-use, have good potential to gain traction on-ground and enhance stakeholder support for landscape-scale conservation. Indeed, it is likely that this risk to human safety is why a proportion of respondents voiced agreement to elephants being restricted to forest reserves. This perception arguably highlights most succinctly the need for landscape-scale conservation programs to take into consideration the multiple ecological requirements of target species. Fencing-off of reserves to restrict wildlife within––a strategy adopted by park managers purportedly to mitigate human–wildlife conflict, and one that likely purveys this attitude observed among stakeholders here––can simultaneous block elephant connectivity, to the serious long-term detriment of the species (Goswami and Vasudev, 2017; Osipova et al., 2018). Addressing people's safety risks effectively without detracting from the need of the wide-ranging elephant to disperse, and range extensively in search of resources, is critical.

It is worthwhile to note that even while expressing concerns for safety, people still retained the idea that the danger from elephants increased on provocation (Fig. 2). This reveals an opportunity to translate this attitude to behaviour that ameliorates rather than aggravates human–wildlife conflict. Enhancing the participation of respondents who report positive attitudes to elephants in locally managing human–elephant relationships could additionally prove useful. Importantly, while Kansky et al. (2014) in a review of attitudes towards conflict-prone animals find overall positive attitudes towards the focal species, Oli et al. (1994) demonstrate that positive leanings can erode in the face of sustained conflict and changing contexts. In a longitudinal study of attitudes towards wolves in Wisconsin, USA, Treves et al. (2013) also found a decrease in appreciation of wolves and concurrent decreased tolerance for conflict-induced losses to wolves; this decrease did not correlate with exposure of respondents to human–wolf conflict. There is, in fact, anecdotal and scientific evidence to suggest that changing socio-economic contexts is eroding intrinsic and traditional motivations for conservation support (Manfredo et al., 2003); these motivations are central to fostering conservation support in our landscape. Going forward, therefore, revitalizing intrinsic values of wildlife (belief in the intrinsic right of species to survive, traditional and regional links, and empathy with animals) should be incorporated into stakeholder engagement efforts of conservation programs.

We note that the findings we provide represent people's reported attitudes. Yet multiple factors, such as social norms, could lead to misreporting (Fisher, 1993). We addressed this to the best of our ability by instrumenting the questionnaire sensitively and addressing similar issues through varied phrasing. We also note that we restrict our inference to just one group of stakeholders for elephant conservation, namely tea estate staff. Nonetheless, we believe that our survey spanning a wide range of tea estates, an important land-use in our study area as well as other heterogeneous landscapes, can have significant implications for human–wildlife co-existence.

5. Conclusions

There is no doubt that conservation programs worldwide must increasingly engage with stakeholders (Bennett et al., 2017). For such engagements to be effective, an understanding of stakeholder perspectives is a fundamental requirement, and one that needs to adaptively feed into ongoing engagements as well as long-term conservation plans. Our findings show that such an understanding of stakeholder attitudes can highlight some of the challenges for conservation that may be most critical locally. At the same time, our research highlights the complexity of people's attitudes towards conservation,

particularly as it relates to species that potentially impact them negatively (Kansky et al., 2014). Importantly, we submit on the basis of our results, that there is value and utility to making a distinction between notional and more practical aspects of conservation. We caution that studies dealing strictly with notional attitudes to conservation may overstate conservation support in a landscape; it is likely attitudes towards the more practical, localised aspects of conservation that are more direct antecedents to human behaviour in response to wildlife presence or conservation actions. Ultimately, understanding current stakeholder attitudes will determine our ability to foster support for conservation of threatened species, trigger behavioural change towards more 'wildlife-friendly' responses to conservation, and shape human–wildlife interactions into the future.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We are grateful to the U.S. Fish and Wildlife Service – Asian Elephant Conservation Fund (Grant Nos. F15AP00338 and F16AP00326), and Department of Science and Technology – INSPIRE Faculty Award for financial support; the management and staff of all tea estates included in this survey for their encouragement and participation; Centre for Wildlife Studies for administrative support; and S. Sona, L. Gogoi, A. Bawri, B. Gogoi and V. Chaudhary for being part of the data collection and management efforts. We additionally thank two annonymous reviewers for providing constructive comments that helped strengthen this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.gecco.2020.e00936.

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