

Title: Local attitudes toward Amur tiger (*Panthera tigris altaica*) conservation in the Russian Far East

Running head: Attitudes toward tiger conservation

Anna. S. Mukhacheva^{1#}, Eugenia V. Bragina², Dale G. Miquelle², Heidi E. Kretser^{2, 3}, Vasilissa V. Derugina²

1 Sikhote-Alin State Nature Reserve, Primorskii Krai, Russia

2 Wildlife Conservation Society, Southern Boulevard, Bronx, New York, USA

3 Department of Natural Resources, Cornell University, Ithaca, New York, USA

#Corresponding Author Email: siam83@mail.ru

ABSTRACT

Public support is a necessary component of large carnivore conservation. We analysed public opinion on Amur tigers, *Panthera tigris altaica*, in Russia's Far East, the northernmost stronghold of the world's rarest big cat. We surveyed 1035 people in 5 settlements at increasing distances to tiger habitat. Overall support for tiger conservation was high (95.4%), although lower in more rural communities—especially among hunters—with limited socio-economic opportunities, and where tigers pose a higher perceived threat to livelihoods. Nearly 20% of respondents supported

lethal removal of individual problem tigers that posed a threat to humans. Non-hunters, higher-income earners, and people who rated their communities' pre-college education positively showed less support for even such restricted killing of tigers. Hunters were more likely to support the idea of legalising tiger hunting (hunting tigers is a felony in Russia), and less likely to attribute tiger decline primarily to poaching. Despite strong support for tiger conservation in both urban and rural settings, a subset of the local populace is still engaged in poaching and trading of tigers, making improved situational crime prevention a needed focus of future efforts, alongside behaviour change campaigns promoting active resistance to poaching among tiger supporters.

KEYWORDS

Survey, public opinion, tigers, large carnivore conservation, human-wildlife conflict, hunting

Abstract in Russian: <https://bit.ly/3KBDU1A>

INTRODUCTION

Successful coexistence of people and large carnivores requires public tolerance (Bruskotter and Wilson 2014), which is often associated with social and psychological variables such as age, gender, education, social group, risk perceptions, and economic characteristics (Williams et al. 2002, Røskoft et al. 2007, Inskip et al. 2016). On the one hand, attitudes toward carnivores are built on deeply rooted values resistant to change (Boninger et al. 1995, Bjerke and Kaltenborn 1999) while on the other, attitudes can be influenced by parameters such as social norms,

knowledge, risk perception, and income size (Naughton-Treves et al. 2003, Arjunan et al. 2006, Treves and Bruskotter 2014, McGovern and Kretser 2015); all of which could be targeted using management interventions such as improving livelihoods (Clements et al. 2020) or implementing social marketing campaigns (Salazar et al. 2019). The extent to which these factors matter varies across cultural and geographical contexts (Inskip et al. 2016), making understanding them critical for efficient management (Naughton-Treves et al. 2003). For large carnivores with extremely low population numbers, the loss of a single animal could be detrimental to species persistence (Nyhus and Tilson 2010). Yet, the potential benefits of legal hunting of carnivores as a way to improve prospects for conservation has often been considered (Treves 2009, Kaltenborn and Brainerd 2016, Linnel et al. 2017). Understanding attitudes and the conditions under which those who must coexist with large carnivores believe hunting them would be justified could provide insights into the types of interventions needed to deter poaching or to diminish calls for legal hunting.

The endangered Amur tiger (*Panthera tigris altaica*) in Russia's Far East is one of the world's most iconic carnivores. In 1947, Russia was the first country to ban tiger hunting, and conservation efforts over the next forty years led to a substantial tiger population recovery (Miquelle et al. 1993). Surveys of tiger mortality from the 1950s through the 1980s failed to reveal evidence that tiger poaching occurred to generate income (Gorokhov 1983, Nikolaev and Yudin 1993). However, with the fall of the Soviet Union came a collapse of the financial system, rampant inflation, and an opening of borders; tiger poaching for monetary gain soared in the 1990s (Galster and Vaud Eliot 1999, Mills and Jackson 1994). Poaching became the primary cause of tiger mortality in the 1990s—2000s (Goodrich et al. 2008, Robinson et al. 2015), despite relatively high public support for tiger conservation (85.1%, Sukhomirov 2002), even among hunters, of whom only 2% considered tiger hunting acceptable (Zabanova et al. 2003). The Russian Federation created a Tiger Response Team (TRT) in 1999 to address human-tiger conflicts, in part to prevent poaching by locals to eliminate problem tigers (Goodrich et al. 2011). In 2013, Russian federal laws were

updated to close loopholes related to the transportation, storage and hunting of all federally endangered species (Miquelle et al. 2007, Aramilev et al. 2016). But despite efforts to address human-wildlife conflicts and strengthen laws, tiger numbers remain low and poaching is still evident (Lapusin 2010, Aramilev 2016 et al., Skidmore 2021 a and b). Poaching is done by locals, some of whom may be retaliating for loss or other conflicts, and some of whom may be connected with larger networks for illegal trade (Goodrich et al. 2008, Goodrich 2010, Lapusin and Fomenko 2015, Skidmore 2021a).

Given the strong support for tiger conservation in prior studies (Sukhomirov 2002), we sought to assess current attitudes toward tigers by looking at the role of demographics, perceived socio-economic conditions, leisure activities, and tiger encounters. We were also interested in attitudes about poaching, as it remains the largest contributor to tiger mortality. With the challenges of measuring direct support for an illegal activity (Gavin et al. 2010), we sought to collect information on 1) knowledge of poaching as an issue; 2) attitudes toward profiting financially from hunting tigers; 3) attitudes toward killing problem tigers; and 4) perceptions of the inviolability of a tiger's life (e.g., opposition to the killing of tigers under any circumstances). Studies of human-carnivore coexistence indicate that support for the hunting of a protected species may be indicative of wider distrust in the 'distant' governing authority declaring a species protected, a perceived mishandling of prior conflicts, or a radicalised form of rural resistance (Von Essen et al. 2015, Linnell et al. 2017, Skogen and Krangle 2020). Strong support for tiger hunting could indicate a need for additional research by those in favour, to determine whether underlying issues related to perceptions about the tiger population, attitudes toward management, conflict resolution, or socio-economic struggles need to be addressed.

Most studies of public opinion on tigers have focused on Bengal tigers in countries where rural populations live a predominantly subsistence lifestyle (Carter et al. 2013, Reddy and Yosef 2016,

etc). Given Primorskii Krai's relatively more developed economy, we expected public opinion on tigers to be more aligned with perceptions of carnivores in places where subsistence and agriculture are less dominant (Røskoft et al 2007). As such, we anticipated strong support for conservation among urban residents and among people who feel that their communities are socio-economically secure. We also expected higher support for the targeted hunting of problem tigers among rural residents, those perceiving unfavorable socio-economic conditions in their communities, and hunters. A better understanding of local attitudes towards tigers should provide insight on what conservation actions will be needed in the future, and on who should be the focus of these actions.

2. METHODS

2.1 Study area

We conducted our study in Primorskii Krai, Russia (165, 900 sq. kms), an area that contains 26, 924 sq. kms of protected land, including the Sikhote-Alin Biosphere Reserve (4,016 sq. kms), and a human population of 1.9 million. Due to low prey population density (Miquelle et al. 1999), hunting, and poaching (Goodrich et al. 2008), tiger numbers have been consistently low for twenty years: 415-476 individuals in 1996, 428-502 in 2005 (Miquelle et al. 2007), and 523-540 in 2015 (Aramilev et al. 2016).

Primorskii Krai's economy is based primarily on fishing, industrial logging, mining, military, and finance. Our study area included Vladivostok, the major urban and administrative center of the province, and four smaller settlements: Spassk-Dalnii, Kavalerovo, Plastun, and Terney (Figure 1). We selected these communities based on close proximity to core tiger habitat and to provide a representative gradient of urban to rural survey respondents (Figure 1). Residents, especially in the smaller settlements, spend leisure time gathering wild produce (pine nuts, berries, mushrooms, etc.) in the summer, fishing in summer and fall, and hunting year-round.



Figure 1 Amur tiger range in Russia, and settlements where the survey was conducted (Source: Miquelle et al. 2005a).

Plastun and Terney are the smallest, most rural of the surveyed settlements; they lie in the same district, have similar socio-demographic characteristics (Table 1, Supplementary Information I), and were combined for data analysis. Both are situated adjacent to Sikhote-Alin Biosphere Reserve, one of the most important protected areas in Russia for tigers. People in these settlements live in close proximity to large carnivores, with relatively frequent visual encounters. Kavaleroovo is the second most rural community, and Spassk-Dalnii is the largest and least rural of the small settlements with approximately one-quarter of its population employed in industrial enterprises. Both of these communities lie adjacent to suitable tiger habitat, but farther from known tiger populations than Terney and Plastun. Tigers rarely occur on the peninsula where the city of Vladivostok is located.

2.2 Data Collection

Respondents were surveyed in June-August 2015 by social science students from the Far East Federal University. The students intercepted potential survey respondents through a non-random convenience sample stratified within the communities at one or more highly used public facilities (e.g., schools, courthouses, hospitals, stores, bus stops, etc.) to gather diverse perspectives (McGovern and Kretser 2015).

Surveyors questioned whoever agreed to participate until the minimum sample size was reached. We used power analysis to determine the minimum sample size for each settlement, based on population size (all individuals over 18 years of age in a given settlement), at a significance level of 0.05. Men and women were surveyed in approximately equal proportions (Table 2, Supplementary Information II). Respondents answered survey questions, while surveyors recorded their answers on survey sheets.

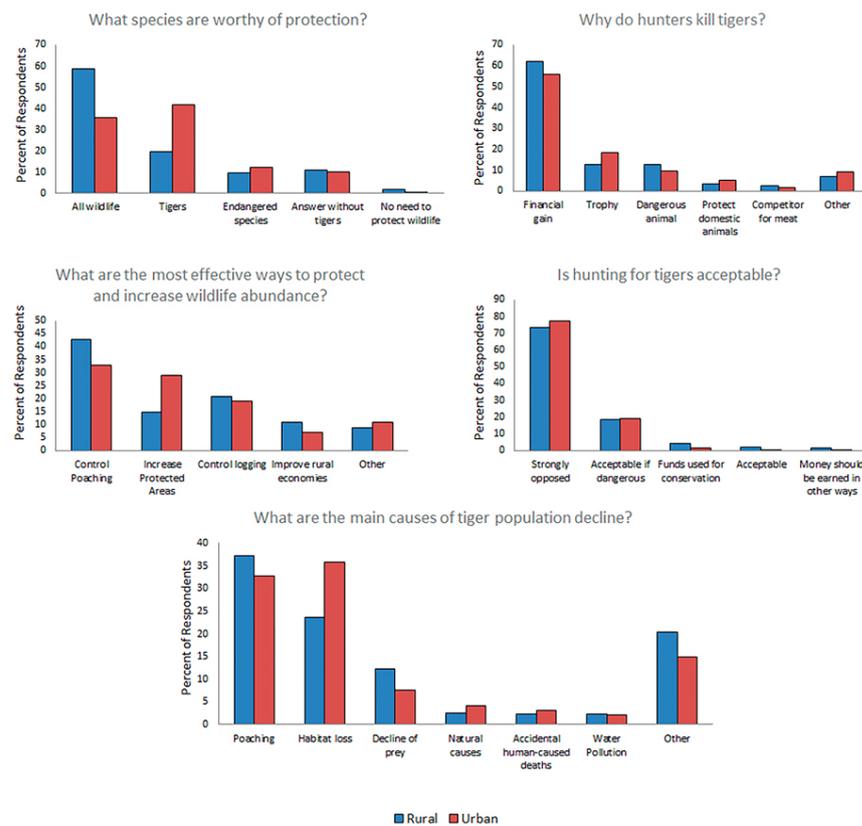


Figure 2: Responses of urban and rural dwellers from Primorskiï Krai, Russian Far East, June-August 2015 to the question a. “In your opinion, which wildlife species in Russia should be protected?” (n = 861); b. “Why do hunters kill tigers?” (n = 1030); c. “What are the most effective ways to protect and increase wildlife abundance?” (n = 1031); d. “Is hunting for tigers acceptable?” (n = 1032); e. “Which of the following reasons, in your opinion, are the main causes of tiger population decline?” (n = 1031).

2.3 Survey Design

We asked 22 questions to assess demographics, occupation, quality of life, experience with tigers, and attitude towards tigers (see Supplementary Information for full survey). Quality of life assessments were based on perceptions of healthcare availability, quality of pre-university education, public transportation quality, employment opportunities, prospects for young people, and leisure activities. Respondents used a 5-point scale (1 = bad, 5 = excellent) to assess these variables. As a measure of leisure activities, we asked respondents to select their most preferred

nature activity among ecotourism, fishing, hunting, gathering (e.g., berries, mushrooms, etc.), or “other”.

Nine questions were directly or indirectly related to people’s attitudes towards tigers (Supplementary Information). Respondents were asked whether they had ever seen a live tiger (in a zoo or in the wild), what wildlife species in Russia they believe need protection, whether tigers need protection, and where tigers should be protected (e.g., just in protected areas, or across their entire range).

Hunting an Amur tiger is a felony in Russia. Asking respondents about an illegal activity would likely yield inaccurate results (Gavin et al 2010), thus we avoided direct questions about support for poaching. We anticipated that many respondents (especially in rural areas) would be hunters or would likely have friends/neighbors who hunt, so we included three questions related to the hunting of tigers. We first asked about respondents’ perceptions of what causes tiger mortality, to determine whether they considered poaching or some other factor to be the primary problem. We then asked why they thought hunters sometimes kill tigers. Lastly, we asked respondents how they felt about making tiger hunting legal. With this question, we aimed to determine the prevalence of unconditional acceptance of tiger hunting, acceptance for financial gain, acceptance only in the special case of problem tigers, or blanket objection to tiger hunting.

Finally, we sought to determine what percentage of the survey population considers anti-poaching efforts to be a priority action for tiger conservation by asking: “In your opinion, what are the most effective ways to protect and increase wildlife abundance?”

2.4 Data Analysis

Based on similar levels of support for tiger conservation among the three more rural communities (see Results), we grouped Spassk-Dalnii, Terney-Plastun, and Kavalerovo into a single “rural”

population in close proximity to tigers. We compared responses from this population to those of the “urban” Vladivostok population that is further removed from tigers (Table 1).

To assess support for tiger conservation, we compared urban and rural responses to individual questions directly related to tigers, using Chi-square tests. We used the same approach to compare the subset of respondents who identified themselves as hunters to non-hunters. When expected values were less than 1, or more than 20% of categories were less than 5, we deleted those cells from the analysis (Zar 2009).

After assessing individual questions, we used generalised linear mixed (GLM) modeling (Zuur et al. 2009) to assess what factors might drive support for tigers. Random factors did not improve the model, according to Bayesian Information Criterion values (Burnham and Anderson 2002). We used GLMs with a binomial distribution (link=logit) to assess which factors affect attitudes towards tigers, and which factors influence the likelihood of support for lethal removal of problem tigers.

To make a binomial dependent variable for the question “In your opinion, is the Amur tiger in need of protection?”, we pooled the responses “Definitely yes” and “Probably yes” into one “Yes” category, and the “Definitely not” and “Probably not” into one “No” category. We excluded respondents who said “Not sure” from further analysis.

For model building, we restricted our question about hunting to a binary dependent variable by focusing on the statements that received the highest responses: “The idea of tiger hunting is only acceptable in the context of hunting individual problem tigers that pose a threat to humans,” and “Tiger hunting is absolutely unacceptable.”

For a global model of attitudes towards tiger conservation, we included the parameters ~ gender + age + healthcare quality + opportunities for leisure + transportation quality + quality of pre-college education + employment opportunities + life prospects for young people + respondent enjoys outdoor leisure time (Y/N) + duration of current residency + income size + income stability + hunter/non-hunter + respondent ever saw a wild tiger (Y/N)

A global model of factors driving support for killing problem tigers included the same factors as the attitude global model above, plus attitudes toward tiger conservation and whether the respondent was from an urban or rural community.

The best models were chosen based on BIC values (Burnham and Anderson 2002).

3. RESULTS

We surveyed 1035 residents in Primorskii Krai (Table 2, Supplementary Information II). Of these, 386 were from the urban population of Vladivostok, and 649 were from rural populations. Ninety-six respondents (9%) were hunters, and overall 24% had seen a live tiger, including 29.2% of our rural respondents and 16.9% of the urban population.

3.1 Support for tiger conservation in rural versus urban communities, and among hunters versus non-hunters

When asked directly about the need to protect tigers, 95.4% of respondents said that tigers definitely or probably needed protection. Surprisingly, rural communities also showed strong support for tiger conservation, 93.7%, but less than the urban population of Vladivostok, 98.5% ($\chi^2 = 11.6$, $df = 1$, $p < 0.001$, $n = 1035$).

When asked to list wildlife species that need protection in Russia, significantly more urban respondents (40% urban vs 19% rural) listed tigers ($\chi^2 = 59.7$, $df = 3$, $p < 0.001$; Figure 2a). Only a few respondents (1 urban and 9 rural) indicated that no protection for any species was needed.

Rural and urban residents had significantly different explanations for the tiger population decline ($\chi^2 = 25.63$, $df = 6$, $p < 0.001$). Rural respondents tended to consider poaching (37%) a bigger problem for tigers than habitat loss (23%), while urban respondents identified habitat loss as a bigger problem than poaching, 36% vs 32% (Figure 2e). Eighty percent of respondents who attributed tiger decline to “other” reasons stated that multiple factors could be at play.

Hunters and non-hunters did not differ significantly in their beliefs about what causes tiger decline ($\chi^2 = 9.8$, $df = 6$, $p = 0.13$).

We found no significant differences across urban and rural beliefs regarding why a person might kill a tiger ($\chi^2 = 9.88$, $df = 5$, $p = 0.079$). Slightly more rural respondents believed that this happens for financial gain (62% rural vs 56% urban respondents), and slightly more urban respondents thought that people kill tigers as trophies (18% urban vs 13% rural; Figure 2b). Hunters were less likely to consider poaching for financial gain to be the primary reason for which tigers are killed (50% vs 62% non-hunters) and more likely to claim that tigers are killed because they are dangerous (17% vs 8% non-hunters), though the difference was not significant ($\chi^2 = 8.22$, $df = 4$, $p = 0.084$). Few respondents believed that tigers are killed to protect domestic livestock (4%), or because they compete with humans for the same prey (2%), or for other reasons (8%).

Rural and urban dwellers identified significantly different ways to protect wildlife ($\chi^2 = 35.10$, $df = 4$, $p < 0.001$). Both groups agreed that stricter penalties on poaching are the primary action needed, although a larger percentage of rural respondents (43% vs 33% urban) felt this way (Figure

2c). Urban dwellers were more likely to believe that adding more land to the protected areas system would help protect wildlife (29% urban vs 19% rural). Only 10% of all respondents thought that improvement of local economies would effectively protect wildlife. Of the 10% that listed “Other,” more than half included an answer related to education or outreach.

Hunters were less likely to consider stricter criminal penalties for poaching the most effective way to protect wildlife (31% of hunters vs 55% of non-hunters), and were more likely to consider better control of logging (38% vs 27% of non-hunters) or an increase in protected areas (22% of hunters vs 13% of non-hunters) more effective for wildlife protection ($\chi^2 = 14.3$, $df = 4$, $p < 0.001$).

Results indicated no difference between urban and rural levels of tolerance for tiger hunting; irrespective of location (73% rural vs 77% urban), roughly three quarters of respondents were categorically opposed to tiger hunting ($\chi^2 = 8.99$, $df = 4$, $p = 0.0613$). Another 19% agreed with the idea of “hunting” tigers only in the context of killing individual problem tigers that pose a threat to humans. While the majority of hunters agreed that the hunting of tigers was unacceptable, this outlook was significantly ($\chi^2 = 10.634$, $df = 3$, $p < 0.05$) more prevalent among non-hunters (61% vs 76%). Hunters also found it more acceptable to kill a problem tiger (29% of hunters vs 18% of non-hunters). Overall, less than 2% of respondents were fully supportive of tiger hunting (Figure 2d).

3.2 Drivers affecting attitudes toward tiger conservation

In the urban population of Vladivostok, with its almost unanimous support for tiger conservation, no drivers affected respondents’ attitudes toward tiger conservation. For the collective rural population of Terney-Plastun, Spassk-Dalnii, and Kavalerovo, the most parsimonious model (smallest BIC and highest BIC weight) indicated that women were more supportive of tiger

conservation than men, and a perception of better prospects for young people increased the likelihood of support for tiger conservation (Table 3 Supplementary Information III, Figure 3).

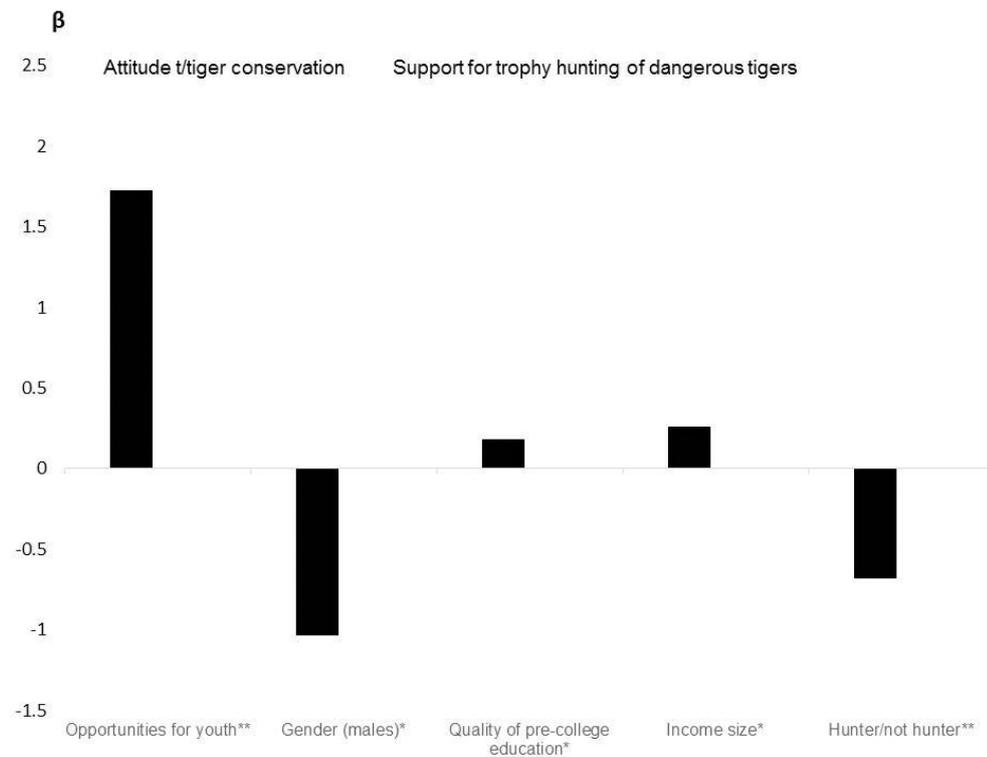


Figure 3: Best fit generalized linear models for attitude toward tiger conservation in rural populations (n = 467) and support for hunting of tigers if they pose a threat to people (n = 825). * $p < 0.05$ ** $p < 0.01$.

3.3 Drivers of attitudes toward tiger hunting

Because respondents' opinions on tiger hunting did not differ significantly between rural and urban populations, we analyzed all survey respondents as a single group. The most parsimonious model (smallest BIC and highest BIC weight) suggested that higher income and a higher perceived quality of pre-college education correlated with lower acceptance of tiger hunting, while hunters

were more likely to consider tiger hunting acceptable (Table 3 Supplementary Information III, Figure 3).

4. DISCUSSION

We found that overall public support for Amur tiger conservation was 95.4%, i.e., even higher than reported earlier (85.1%, n=676, Sukhomirov 2002). The surprisingly similar results in rural and urban settings indicate strong support for tiger conservation, regardless of perceived socio-economic conditions (e.g., income size, health care, level of education). Differences between people living in close proximity to wolves and other large carnivores and those living in urban areas were reported to be much greater in Sweden and Norway (Karlsson and Sjöström 2007, Røskaft et al. 2007). The similarity across sites in the Russian Far East may be associated with the extensive education/awareness campaigns that have been ongoing since the late 1990s. In addition to numerous social and media campaigns focused on tiger conservation, Tiger Day celebrations have been bringing thousands of people to the center of Vladivostok annually since 2000, with extensive local and national news coverage. Similar, though smaller, celebrations in Terney have been ongoing since 2006. It is possible that these far-reaching efforts, available to everyone regardless of income level, have reduced the difference between support for tiger conservation in rural versus urban areas.

In rural settings, women were more supportive of tiger conservation than men. This is a common trend in relatively industrialised societies (Williams et al. 2002), although situations in which men are more supportive of large carnivores also occur (Kellert 1987, Bath 2000, Andersone and Ozolinš 2004, Mir et al. 2015). Lower support for large carnivore conservation by women usually results from higher perceived risk and from daily exposure to that risk (Andersone and Ozolinš

2004, Røskaft et al. 2007, Ogra 2008, Prokop and Tunnicliffe 2010, Doubleday 2020). Even though attacks on humans are rare (Goodrich 2010), Sukhomirov (2002) reported that Khabarovsk Province residents greatly exaggerated the frequency of tiger attacks on domestic animals, and that 51.7% of respondents (urban and rural) stated that they were afraid of tigers. We did not specifically ask if people were afraid of tigers, but our results suggest that perceived risk was not sufficient to reduce support for tiger conservation. Men in the Russian Far East have lower employment rates in rural areas than women, and spend more time in forests (either hunting or gathering non-timber forest products), and hence fall into socio-economic categories that tend to have lower support for large carnivore conservation. Men are nearly always the perpetrators in tiger poaching crimes in the Russian Far East, for which one of the top motivations cited is economic poverty (Skidmore 2021a). Thus, interventions that promote stable livelihoods and/or address the deeper socio-economic issues that contribute to illegal hunting should specifically target rural men (von Essen et al 2015; Pohja-Mykrä 2016; Skidmore 2021a and b).

Motivations for killing tigers seem to have changed since the collapse of the Soviet Union. Two studies that covered the period 1951—1990 (Gorokhov 1983; Nikolaev and Yudin 1993) reported that of 105 tigers killed by people, none were poached for financial gain. However, data collected using the same methodology during 1991—2001 (n = 22 tigers) indicated that 73% of tigers were killed for financial gain (Miquelle et al. 2005b). New incentives emerged with the collapse of the Soviet Union – a valuable lesson on how profound socio-economic and political changes can impact people’s views and exploitation of natural resources (Bragina et al. 2015). Our research confirms that local residents still consider financial gain the dominant motivation for poaching tigers.

We found little unconditional support for tiger hunting (less than 2%). Approximately 20% of respondents supported the “hunting” of tigers in the narrow context of killing conflict tigers; these

respondents were more likely to be hunters, to have low incomes, and to rate the quality of pre-college education available in their community poorly. This is consistent with past studies, in which 20% of respondents in Primorye and Khabarovsk Provinces believed that tiger protection should not supersede human safety (Zbanova 2003). Despite these results, poaching of tigers not involved in conflicts and tiger prey is common in the forests of the Far East, and seems to be passively accepted by local communities. Thus, determining how to convert the strong support for tiger conservation into an intolerance for poaching is clearly an important task for the future (Steinmetz et al. 2014, Wilkie et al. 2016).

More work is needed to understand what experiences supporters of tiger hunting have had with human-tiger conflicts, and how they perceive efforts to address human-tiger conflicts (Carter and Linnell 2016, Trajçe et al. 2019). Such inquiries may reveal whether tiger poaching occurs as a livelihoods crime or a socio-political crime in protest of natural resource management authority (von Essen et al. 2014). For example, many hunters use dogs that are easy prey for tigers in the field while hunting or when tethered outside at night (Goodrich et al. 2011). Retaliation for the loss of a dog may indicate a livelihoods-related crime, with hunters acting to protect their economic opportunities. An earlier survey suggested that hunters who spend much of the winter hunting will shoot tigers only to provide more security, often leaving the tiger carcass in the field (Zabanova et al. 2003). On the other hand, more recent work suggests that even when tigers are killed for other reasons, their remains are sold (Skidmore 2021a), indicating that the monetary value of tiger parts is difficult to forego. This more recent research also suggests that the strengthening of anti-poaching laws in 2013 reduced the number of poachers, but not necessarily the actual rate of tiger poaching. The small group of poachers and their respective buyers is a tight knit, efficient network where “the people who know people” kill tigers and are able to profit from selling their parts afterwards. (Skidmore 2021b, p10).

Our findings are limited by the non-random sampling methodology, which was likely biased towards individuals willing to talk about tigers and/or people who more frequently visit public places in community centers. That said, this is one of just three social inquiries on local attitudes toward Amur tigers in the Russian Far East, and the only one conducted within the last decade. Thus, we provide a launching point for considering social factors that should be explored in this region to improve tiger conservation.

Overall, our results are similar to the levels of support for Bengal tigers found in the Sundarbans of Bangladesh (Inskip et al. 2016) and Central India (Reddy and Yosef 2016), where 93-96% of local respondents—many of whom relied on local natural resources—supported tiger conservation, sometimes in spite of personal losses. However, we do not conclude that high public support for tiger conservation, even in rural areas, translates into a safe environment for tigers. The ongoing poaching in the Russian Far East suggests that, even with the strong local support we documented; conservation efforts could be at risk of failure if a small segment of the local human population intensively exploits a species for financial gain (or for any other reason) while local communities passively allow such transgressions (Zabanova et al. 2003). This appears to be the case in the Russian Far East, where a small subset of the population is actively poaching and trading tiger parts (Skidmore 2021a), and is likely the primary factor limiting tiger numbers (Goodrich et al. 2008, Robinson et al. 2015). Under conditions where a relatively small, but organised group of tiger poachers is operating, systemic changes to improve law enforcement efforts focused on strategic situational crime prevention intervention to dismantle poaching and wildlife trade, as well as any corruption that allows those activities to continue (Stoecker and Shakirova 2013, Skidmore 2021b), will be a key component of successful tiger conservation efforts. Continued education activities, in the form of targeted social marketing for behaviour change, are essential to maintain existing support, but must ultimately translate into a willingness by communities to engage in anti-poaching or anti-trafficking activities (Steinmetz et al. 2014,

Wilkie et al. 2016). Inclusion and empowerment of local citizenry in natural resource management, along with a strong enforcement effort to disrupt and dismantle the poaching/trafficking system, may likely determine the fate of the Amur tiger in Russia.

Supplementary material: <https://bit.ly/37B3cPj>

Author Contributions Statement: Conception or design of the work: ASM Data collection: ASM. Data analysis: ASM, EVB, DGM. Drafting of manuscript: ASM, EVB, DGM, HEK, VVD. Critical revision of manuscript: HEK, DGM, VVD. Final approval of the version to be published: HEK, VVD, ASM, EVB, DGM. All authors contributed critical, intellectual content to the drafts and gave final approval of the version to be published.

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Research Ethics Approval: This research originated as a project of the Sikhote-Alin Biosphere Reserve, an institution that does not have an ethics approval process for social surveys. Collaborators from the Wildlife Conservation Society with access to an Institutional Reserve Board were added after data collection commenced. The Reserve staff consulted with the Department of Sociology Chair at Far Eastern Federal University to review the questionnaire and research methods and ensure the process met the ethical research standards of that University. The researchers took precautions to address ethical issues by ensuring all participants provided oral consent to being surveyed, providing training to data collectors to respect privacy, and by not collecting any personal identifiers such as names.

Data Availability: We presented all the materials in the Supplementary Information.

Preprint Archiving: No

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