Journal of Threatened Taxa

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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

COMMUNICATION

COMMUNITY-BASED STUDY TO DEMONSTRATE THE PRESENCE AND LOCAL PERSPECTIVES OF THE CRITICALLY ENDANGERED CHINESE PANGOLIN *MANIS PENTADACTYLA* IN ZHEJIANG WUYANLING, CHINA

Hongying Li, Shusheng Zhang, Ji Zhang, Zupei Lei, Fangdong Zheng & Peter Daszak

26 April 2020 | Vol. 12 | No. 5 | Pages: 15547–15556
DOI: 10.11609/jott.5149.12.5.15547-15556

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Journal of Threatened Taxa | www.threatenedtaxa.org | 26 April 2020 | 12(5): 15547–15556
ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)
DOI: https://doi.org/10.11609/jott.5149.12.5.15547-15556
#5149 | Received 10 June 2019 | Final received 09 April 2020 | Finally accepted 14 April 2020
PLATINUM OPEN ACCESS

COMMUNICATION

Community-based study to demonstrate the presence and local perspectives of the Critically Endangered Chinese Pangolin *Manis pentadactyla* in Zhejiang Wuyanling, China

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Abstract: Illegal hunting and trading of the Chinese Pangolin *Manis pentadactyla* has pushed this Critically Endangered species close to extinction. While local reports have suggested its continued presence in mainland China, this has not been confirmed by a research group except for a survey of presumed pangolin burrows in 2004. We conducted a six-month field study using infrared camera surveillance and community questionnaire survey in Zhejiang Wuyanling National Nature Reserve in China, to determine the status of Chinese Pangolins and understand local attitudes towards the conservation of this species. Our study details the first verifiable documentation of two visual records of a Chinese Pangolin in the wild, demonstrating the suitability of pangolin habitat in Wuyanling region, and suggests an increasing awareness and strong willingness in local communities to conserve the Chinese Pangolin.

Keywords: Community attitude, conservation, infrared camera, *Manis pentadactyla*, Wuyanling National Nature Reserve.

非法捕猎和贸易将中华穿山甲这一极度濒危的物种推向了灭绝的边缘。虽然一些本地的报道表明中华穿山甲在中国大陆地区一直存在，但除了2004年一项对中华穿山甲洞穴的研究，目前对中华穿山甲个体在自然生境中的存在尚缺乏充分的记录。该研究在中国浙江乌岩岭保护区进行了六个月的红外相机监测和社区问卷调查，来确定该保护区内中华穿山甲存在的状况，并了解当地居民对于保护中华穿山甲的态度。调查首次获得了中华穿山甲在野外环境中的影像记录，表明乌岩岭地区作为中华穿山甲生境的适宜性，问卷调查的结果反映了当地社区对于保护中华穿山甲具有较强的意识和参与行动的意愿。

Editor: L.A.K. Singh, Bhubaneswar, Odisha, India.

Date of publication: 26 April 2020 (online & print)

Citation: Li, H., S. Zhang, J. Zhang, Z. Lei, F. Zheng & P. Daszak (2020). Community-based study to demonstrate the presence and local perspectives of the Critically Endangered Chinese Pangolin *Manis pentadactyla* in Zhejiang Wuyanling, China. *Journal of Threatened Taxa* 12(5): 15547–15556. https://doi.org/10.11609/jott.5149.12.5.15547-15556

Funding: This study was funded by China Environmental Protection Foundation.

Competing interests: The authors declare no competing interests.

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Author contribution: Study design and fieldwork: SZ, JZ, ZL, FZ, HL; data analysis and writing the article: HL, SZ and PD. Hongying Li and Shusheng Zhang contributed equally to this study.

Ethical standards: This study was approved by the Institutional Review Board at China Jiliang University for the community questionnaire survey.

Acknowledgements: We are thankful for the support of Dr. Fuhua Zhang from Southern China Normal University and Dr. Jinshuo Zhang from the National Zoological Museum of China for species identification, Dr. Aichun Xu from China Jiliang University for field equipment, and the IUCN SSC Pangolin Specialist Group for advice on infrared camera trap setting up. Special thanks to Dr. Aleksei A. Chmura and Alison E. Andre for proofreading the article, as well as the anonymous reviewers who provided critical references and technique guidance to improve this manuscript.

INTRODUCTION

The Chinese Pangolin *Manis pentadactyla* is listed as Critically Endangered by the IUCN primarily due to extensive poaching for their meat and scales (Challender et al. 2019). It receives the highest level of protection from trade in CITES Appendix I (Challender & Waterman 2017). In China, the Chinese Pangolin is listed as a State Category II protected species under the Wildlife Protection Law, with protection from the Regulations on Implementation of Protection of Terrestrial Wild Animals (Zhang 2008). Despite this, the population of the Chinese Pangolin is thought to have declined by 89–94 % since the 1960s (Wu et al. 2004a). Little is known about the current distribution or population of this solitary and nocturnal species, few studies have been conducted in mainland China to detail the population of Chinese Pangolins (Wu et al. 2002). Recent reports suggest that some remnant individuals have been traded in illegal wildlife markets or confiscated from traders, but the provenance of these animals from mainland China has not been verified (Xu et al. 2016).

In 2013, our group recorded two camera-trap images of a pangolin (*Manis* spp.) within the Wuyanling National Nature Reserve (Zhang et al. 2017). The species was not identified due to limited characteristics recognisable in the images. Our current study was designed to further assess the presence of Chinese Pangolins in the reserve and understand local community attitudes towards the species' conservation. Wuyanling National Nature Reserve is located in Taishun County in southern Zhejiang Province (27.706, 119.675) (Figure 1 , 2). The reserve was established in 1975 and is an important bird conservation area (BirdLife International 2019) consisting of subtropical evergreen broadleaf forest with highly diverse flora and fauna. Within an area of 18,861.5ha, the reserve contains 4,170 households with 15,444 residents officially registered with the local authorities, including 3,064 people residing in the core area and buffer zone, and 12,380 in the transition area. The number of residents actually living within the reserve is estimated to be less than 5,000, due to a large number having migrated to cities for work, according to the latest population census in 2017 (Taishun Government 2017).

MATERIALS AND METHODS

Line transect and quadrat survey

Ten (10) line transects ranging 2–6 km in length (total 39.8km) and six quadrats (1.00 hm^2/quadrat) were selected within the reserve extending from the uninhabited regions to the nearby villages. With limited resources, selection of the line transects and quadrats was based on the historical records of pangolin sighting, poaching, and releasing activities, and in an effort to cover the under-researched low-human disturbance areas. Diurnal surveys were conducted in each line transect and quadrat once per month for six months from July to December 2017 to identify and examine potential burrows for Chinese Pangolins. Observational environmental data were collected around each burrow, including estimated duration since burrow excavation, presence of termites and decayed wood, and pangolin faeces or other evidence of active occupation following the methods published in Wu et al. (2004b).

Camera traps surveillance

Sixty infrared camera traps (LTL Acorn 5210A, LTL Acorn 6210) were placed in three surveillance areas around the identified (potentially active) pangolin burrows from the line transect and quadrat surveys, and in the reserve's core area and its adjacent transition area where was not covered by the line transect and quadrat surveys, to maximize the chance of detection. All camera traps were placed 0.5–1 m above ground, with consideration of the ground slope, height of trees, and the inclination angle between 15°–30° to achieve the maximum diameter and range of camera coverage. The intervals between each camera trap and each surveillance area were >500m and >5,000m, respectively. Corresponding to the altitude range of potentially active burrows, the altitudes of camera traps ranged 313–1,128 m across four different vegetation types. All camera traps were installed on 1 July 2017 and active until 31 December 2017. Burrows presumed to be inactive or confirmed to be occupied by other species were omitted in the subsequent investigations, and all potentially active burrows were investigated by the monthly line transect or quadrat surveys and infrared camera traps for six months (Figure 1).

Community questionnaire survey

In order to understand local knowledge of and attitudes toward Chinese Pangolins, a standardized questionnaire was designed in Mandarin (Appendix 1) for community survey. We aimed to obtain a sample size of n=3,000 to be statistically representative, covering 60% of the permanent residents within the reserve at the maximum estimation of 5,000 in total. 1) Prior to recruitment and data collection, study staff from local village committee and Wuyanling National Natural

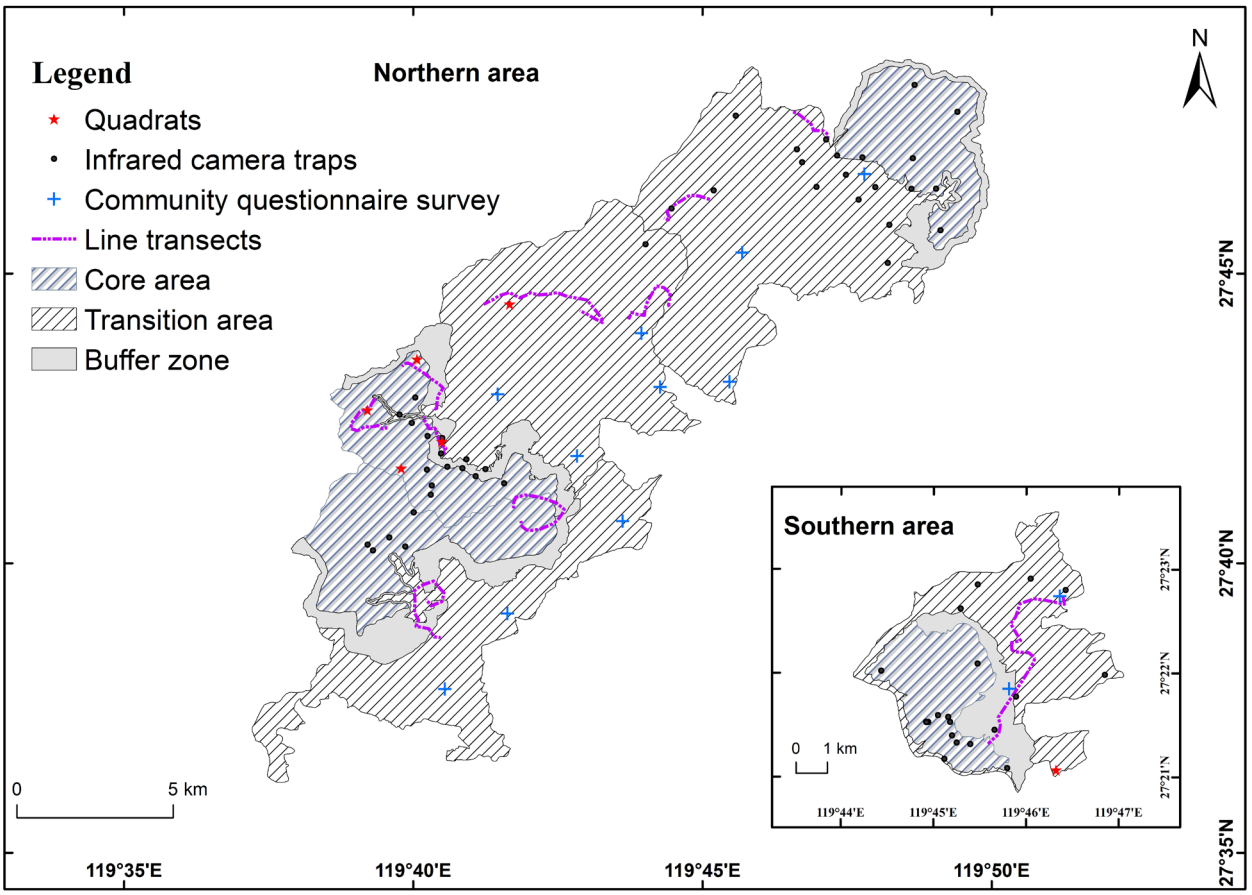

Figure 1. Locations of 10 line transects, six quadrats, 60 infrared camera traps, and community questionnaire surveys among 12 villages in both the northern and southern areas of Wuyanling National Nature Reserve. Surveys were conducted from July to December 2017.

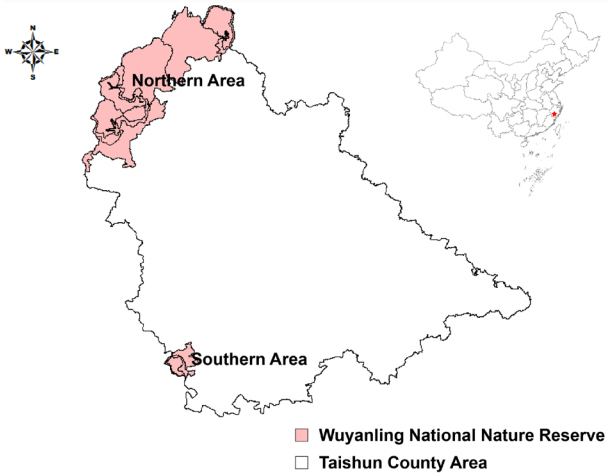

Figure 2. Wuyanling National Nature Reserve in Taishun County, Zhejiang Province

Reserve Management Bureau conducted community meetings, house visits, and broadcasted the information in the village to introduce this study to generate interest in the community; 2) Recruitment was conducted at the community activity centre or town hall in each village where local residents who were interested in the project visited for further information and became potential participants; 3) Study staff informed all potential participants about the survey for consent before data collection; 4) After the completion of informed consent process, questionnaires were administered and one-on-one interviews were conducted in a private setting to ensure confidentiality. Children aged 12–18 years were interviewed with the permission and presence of a parent or guardian (e.g., school teacher). From September to December 2017, a total of 3,041 questionnaires were distributed in 12 out of the 15 villages within the nature reserve. Three villages were omitted from the surveys because they had few residents (<50) or only a small area of these villages was under the administration of the nature reserve. Collected data were entered into IBM SPSS Statistics software Version 25 and analysed by cross-table and Pearson's chi-squared test. All results were translated into English for reporting.

RESULTS

Potentially active burrows for pangolins

A total of 33 burrows were located along nine line transects and in six quadrats in the initial field survey. During the monthly survey, burrows that were estimated to have been created more than 15 days or covered by spider webs and decayed leaves at the entrance were recorded as inactive. Active burrows for Chinese Pangolins were identified based on several environmental factors, including the presence of termitarium and decayed wood (e.g., *Pinus massoniana*, *Cunninghamia lanceolate*) around a burrow (<50m), fresh soil at the entrance, and suspect faeces (Image 1). As the survey was conducted from July to December, seasonal burrow characteristics in regard to the utilization of a burrow, and preferred locations for burrow excavation in summer and winter were considered in identifying the active Chinese Pangolin burrows (Wu et al. 2004b). Active burrows were found at five line transects and two quadrats, further examination confirmed five potentially active burrows for the Chinese Pangolins at two line transects and one quadrat during the six-month survey (Table 1). Some of the active burrows from the initial survey were later confirmed by infrared cameras to be habitats for Chinese Ferret-Badger *Melogale moschata*, Mongoose *Herpestes urva*, or White-Bellied Rat *Niviventer coninga*.

Record of the Chinese Pangolin

A Chinese Pangolin was recorded by an infrared camera on 21 December 2017 during the study period, and another image of a Chinese Pangolin was recorded on 21 January 2018 at a different site (23km straight-line distance from the first recording site) during the preparation of this manuscript (Image 2). The identification of these individuals as the Chinese Pangolin *Manis pentadactyla* was confirmed by notable characteristics, including well-developed external ears with big ear pinna, short heads (neck to snout) covered by small scales, and soft, off-white hair on its underside and face. Their scales are larger than the scales of the Philippine Pangolin *Manis culionensis* but smaller than that of the Indian Pangolin *Manis crassicaudata*, and gradually increase in size behind the ears (Challender et al. 2019; Cota-Larson 2017). While the Chinese Pangolin's geographic range sometimes overlaps with that of the Sunda Pangolin *Manis javanica*, it can also be distinguished by the scales on its flank or behind its ears. Additionally, there are no historic records of the presence of Sunda Pangolins in this region as well (Challender et al. 2014; IUCN SSC Pangolin Specialist Group 2019).

Demographic characteristics of community survey participants

Out of the 3,041 distributed questionnaires, data were collected from 2,654 anonymous participants (87.3% response rate) in 12 villages. Most of the participants (51.1% male; 48.9% female) were subsistence farmers (59.9%) who raise crops and domestic animals. Other significant groups were migrant workers (20.6%), students (12%) and government employees (2.5%) (Table 2).

Knowledge and attitude about Chinese Pangolins

About half of the participants (49%) considered the Chinese Pangolin as endangered or critically endangered

Image 1. Potential active burrows for Chinese Pangolins at Wuyanling: A—an active burrow excavated within 15 days with fresh soil | B—termites and decayed wood around active burrows. © Zhejiang Wuyanling Natinoal Nature Reserve Management Bureau.

Table 1. Observation of burrows in 10 line transects and six quadrats. Active burrows were located at five line transects and two quadrats, further examination confirmed five potentially active burrows for Chinese Pangolins at two line transects and one quadrat.

Line Transect					
	Length (km)	**Burrow(s)**	**Estimated duration of burrow excavation**	**Termitarium & Decayed wood**	**Other Information**
1	5.5	Inactive	>1 month	X	Release location
2	3.2	Inactive	>15 days	X	
3	2.5	Inactive	>1 month	X	
4	5.0	Inactive	>1 month		
5	4.5	Active*	<15 days	X	Suspect faeces
6	4.0	Active	<15 days		Record of other species
7	6.0	None	n/a	n/a	
8	3.5	Active	<15 days		Record of other species
9	2.0	Active	<15 days		Record of other species
10	3.6	Active*	<15 days	X	Record of a Chinese Pangolin
Quadrat					
	Size (hm²)	**Burrow(s)**	**Estimated duration of burrow excavation**	**Termitarium & Decayed wood**	**Other Information**
1	1	Inactive	>1 month	X	
2	1	Inactive	>1 month	X	
3	1	Inactive	>15 days	X	
4	1	Inactive	>15 days		
5	1	Active*	<15 days	X	Suspect faeces
6	1	Active	<15 days		Record of other species

* Potentially active burrows for Chinese Pangolins.

based on their experience and knowledge and 11% believed that it had become extinct locally, while some participants didn't think the Chinese Pangolin was endangered (21%) or expressed no knowledge of its current status (19%). For those participants who were aware of the Chinese Pangolin, they acquired the information mostly from social media platforms (31.4%), school teaching (30.2%), or television (24.1%), government campaign appeared to be a minor (7.1%) channel to disseminate the relevant information. More than half (58.6%) of the participants recognized the ecological value of Chinese Pangolins, but many still regarded the species as a valuable economic (12.7%), medical (20.5%), and food (6.6%) source, and 21% of the participants stated that they would support the use of pangolins or pangolin products for traditional Chinese medicine.

Pangolin consumption in local community

Majority of the participants who reported having consumed pangolin meat or relevant products (101, 3.8%) in their lifetimes were male (73.3%), subsistence farmers (82.2%), and over 50 years old (97%), which was significantly associated with age ($p<0.001$), gender ($P<0.001$), and occupation ($p<0.001$) (Table 3). The taste and nutrition (34.1%), perceived medical benefits (25.4%), demonstration of wealth (15.9%), or simply out of curiosity (11.1%) were reported as the reasons of pangolin consumption. Some participants (11.9%) indicated consuming pangolins as a supplemental source of dietary protein a long time ago (the year was not specified). Other participants reported refusing to consume pangolins because of its illegality (39%), the perceived cruelty (38.4%), the cause of population decline (15.9%), or due to its expected bad taste (6.7%).

Community willingness for pangolin conservation

Most participants (95.3%) indicated that they would report pangolin hunting or trading activities to the forestry department's public security staff (61.3%) or the general public security staff (38.7%). Some participants, particularly those between 31–50 years old ($p<0.001$) regardless of their occupation, reported that they would like to reap the economic benefits of trading pangolins (4.7%). Many participants indicated their willingness to contribute to local pangolin conservation (60%) and

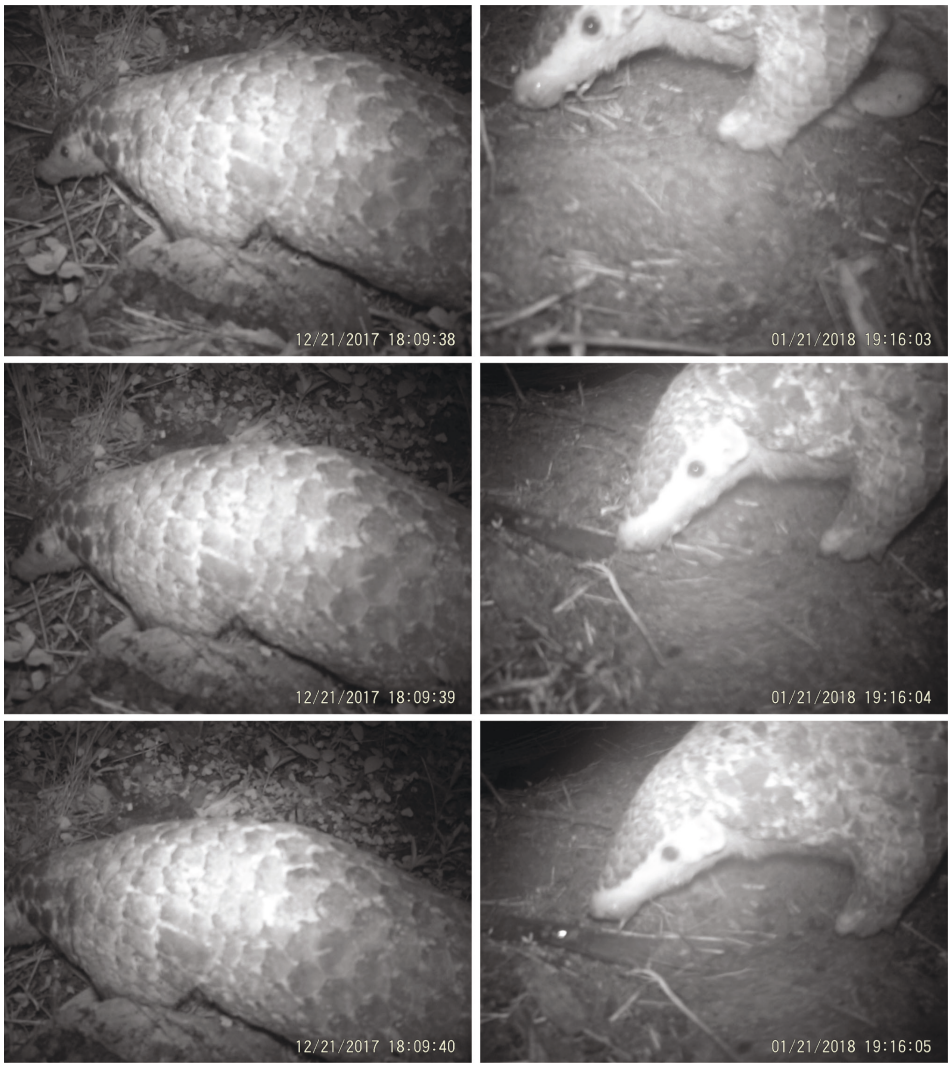

Image 2. Camera trap images of the Chinese Pangolin *Manis pentadactyla* in Zhejiang Wuyanling National Nature Reserve recorded in 2017 and 2018 (ACDSEE Pro). © Zhejiang Wuyanling Natinoal Nature Reserve Management Bureau.

believed that informing the public about the species' protected status would help motivate public action to protect pangolins (60.4%). When asked to provide insights about the specific action that would help protect local Chinese Pangolins, participants emphasized the needs to strengthen law enforcement (21.9%), improve local participation in voluntary work (19.8%), disseminate information (19.7%), refuse to consume pangolin products (19.7%), and actively protect pangolin habitat (16.0%).

DISCUSSIONS

Our camera trap records of the Chinese Pangolin in 2017 and 2018, and the prior record in 2013 in Wuyanling (Zhang et al. 2017) suggest that Wuyanling National Nature Reserve contains a viable habitat for Chinese Pangolins. While samples were not collected for DNA analysis, the distinctive features of the Chinese Pangolin are evident in the video and images captured, confirming its presence (Video 1). Greater efforts needed to conduct initial fieldwork to identify potentially active burrows and increase the coverage of camera traps in Wuyanling region and other sites that are suspected to harbour extant populations of Chinese Pangolins to further understand the populations. In addition, camera traps were positioned at 0.5–1.0 m height in our study based on our experience in mammal surveillance, however, positioning camera traps lower around 30cm above ground may better record Chinese Pangolins and other small mammals in future study (Willcox et al.

Table 2. Demographics of community questionnaire survey participants.

	Participants (n=2,654)	
Characteristics	**Frequency N**	**Percent %**
Gender		
Male	1,356	51%
Female	1,298	49%
Age (years)		
<18	383	14%
18–30	262	10%
31–50	1,247	47%
>50	762	29%
Occupation		
Government employee	67	3%
Peasant	1,590	60%
Student	319	12%
Migrant worker	546	21%
Others	132	5%
Village		
Bai Hai	72	3%
Cha Shi	366	14%
Wu Dou	62	2%
Ma Lian	223	8%
Huang Qiao	557	21%
Zhu Li	264	10%
Yang Bian	109	4%
Dao Jun Yang	285	11%
Wen Yang	58	2%
Xin Bei	256	10%
Ye Shan	186	7%
Shang Di	216	8%

2019).

We noted the existence of an estimated 5–10 burrow entrances grouped within an area of 300m^2, suggesting Chinese Pangolins possibly create burrows in a cluster, which needs further study to confirm. Future field surveys should include collection of faeces or scales for DNA analysis, improved surveillance methods (e.g., distance sampling combined with confirmation of burrow occupancy, proper camera setting), and further understanding of the burrow ecology of Chinese Pangolins. With enhanced methodology, similar research can be conducted at other sites in China and across Asia. The characteristics of the habitat in Wuyanling could be used to identify other potential habitats where extant populations may be identified, as well as for the site selection to release confiscated Chinese Pangolins from the authorities in China. DNA testing of confiscated pangolins will be needed to ensure that only native species are released and the IUCN protocols on the appropriate release of animals into the wild would be followed (IUCN/SSC 2013).

The community survey identified male subsistence farmers over 50 years old as the main population in Wuyanling to have had consumed pangolins. The fact that younger population do not report consumption of pangolins (Nash et al. 2016) may be explained by the improved livelihoods over the past 40+ years leading to improved nutrition and reduced dependence on wildlife as an alternate source of protein. Significant social change has also occurred during this time, including the migration of people into cities for work which may have decreased exposure of younger people to the custom of wildlife consumption. The teaching of wildlife conservation principles in schools and opportunities

Table 3. Questionnaire results from local population in Wuyanling region (n = 2,654): consumption of pangolin products and its associations with the age, gender, and occupation.

			Pearson chi-square		
Pangolin Products Consumption	**Yes**	**No**	**Value**	**df**	**P (2-sided)**
Gender					
Female	27 (26.7%)	1,271 (49.8%)	20.661	1	<.001
Male	74 (73.3%)	1,282 (50.2%)			
Age					
<18 yr	2 (2.0%)	381 (14.9%)	239.686	3	<.001
18–30 yr	1 (1.0%)	261 (10.2%)			
31–50 yr	0 (0.0%)	1,247 (48.8%)			
>50 yr	98 (97.0%)	664 (26.0%)			
Occupation					
Government employee	1 (1.0%)	66 (2.6%)	26.146	4	<.001
Subsistence farmers	83 (82.2%)	1,507 (59.0%)			
Student	0 (0.0%)	319 (12.5%)			
Migrant worker	12 (11.9%)	534 (20.9%)			
Others	5 (5.0%)	127 (5.0%)			

for volunteering in conservation work may also contribute to the changing attitude and behaviour towards conservation of Chinese Pangolins. While the time frame of pangolin consumption among Wuyanling residents was not identified in the questionnaire, local knowledge about the current status of Chinese Pangolins as well as the frequent consumption reported by older participants suggest most consumption may have been historic. Further study will be conducted to understand the context of pangolin consumption behaviours to develop evidence-based behavioural change programs.

Our findings demonstrate an overall positive public attitude towards the ecological value of the Chinese Pangolin and its conservation. There is a significant awareness of the illegality of pangolin hunting and consumption in the communities, prompting the communities to report illegal hunting and refuse consumption. Constant education about the illegality of consumption and reinforced conservation needs of Chinese Pangolins via social media, television, and school programs is recommended to keep raising the awareness and motivate action in the communities for pangolin conservation. In addition, the marked community willingness to participate in pangolin conservation work suggests a potential for positive behavioural changes when effective programs implemented. With a remnant viable Chinese Pangolin population present in the wild in mainland China and a potential generational transformation in public perception of its conservation status, we believe there may still be an opportunity to avoid extinction of this Critically Endangered species.

Video 1. Camera trap video of a Chinese Pangolin in Zhejiang Wuyanling National Nature Reserve, 2017.

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Appendix 1. Community questionnaire

Community Pangolin Conservation Survey in Wuyanling National Nature Reserve

Thank you very much for taking time to participate in this study, all your response will be kept confidential and only used for this study. Please fill in according to your honest thought.

Date : _____ Village : _____ Gender : _____

1. Your Age
1.1 1–18 years old
1.2 18–30 years old
1.3 30–50 years old
1.4 > 50 years old

2. Your occupation
2.1 Migrant worker
2.2 Peasant
2.3 Government employee
2.4 Student
2.5 Others

3. How many Chinese Pangolins you think still exist in Wuyanling?
3.1 Extinct
3.2 Critically endangered
3.3 Endangered
3.4 Not endangered
3.5 I don't know

4. Have you or your relatives ever eaten pangolins?
4.1 Yes
4.2 No

5. What are the reasons you (want to) consumed pangolins? (choose all that apply)
5.1 Out of curiosity
5.2 Source of protein as regular meat
5.3 To show off
5.4 For medical function
5.5 Tasty and nutritious food
5.6 Others

6. What are the reasons that you refuse(d) to consume pangolins (choose all that apply)
6.1 It violates the law
6.2 It's cruel
6.3 Effects on the population and environment
6.4 It doesn't taste good
6.5 They carry diseases
6.6 Others

7. What do you think is the biggest value of pangolin?
7.1 Economic value
7.2 Medicine
7.3 Food
7.4 Ecological value
7.5 Fur and skin
7.6 Ornamental or exhibiting animal
7.7 Others

8. Do you support using pangolin as medicine
8.1 Yes
8.1 No
8.2 I don't know

9. How do you learn about pangolin (choose all that apply)
9.1 Books
9.2 The Internet through computer
9.3 WeChat and other social media platforms
9.4 School teaching
9.5 News
9.6 Government promotion
9.7 Television
9.8 Others

10. Would you like to help pangolin protection work at in Wuyanling?
10.1 Yes, I'd love to very much
10.2 Yes, I'd like to
10.3 No, I don't want to
10.4 I don't care

11. What do you think we can do to protect pangolins (choose all that apply)
11.1 Strengthen law enforcement
11.2 Participate in voluntary protection work
11.3 Refuse to consume wildlife
11.4 Protect the habitat
11.5 Tell friends not to consume
11.6 Others

12. What do you think we can do to motivate local community to protect pangolins? (choose all that apply)
12.1 Promotion and spread the message
12.2 Public education events
12.3 Develop relevant products (e.g. App)
12.4 Voluntary protection activities
12.5 Make documentary about pangolins
12.6 Others

13. What would you do if you find someone hunting or eating pangolins?
13.1 None of my business
13.2 Try to get involve to share the benefits
13.3 Report them
13.4 Ask someone else to report

14. Do you know where to report?
14.1 Forestry public security
14.2 General public security 110
14.3 120 (medical emergency)
14.4 119 (fire department)
14.5 Other

Appendix 1. Community questionnaire (Chinese)

乌岩岭保护区穿山甲社区保护研究调查问卷

非常感谢您在紧张的工作学习之余做这份调查，此份问卷的内容只用于学术研究，对您的回答将给以保密，请放心。希望您根据真实想法填写。祝您工作学习进步，生活愉快！

日期：_____ 所在行政村：_____ 性别：_____

1、您的年龄是?
1.1 1-18 岁
1.2 18-30 岁
1.3 30-50 岁
1.4 大于 50 岁

2、您的职业是？
2.1 外出打工者
2.2 农民或林民
2.3 政府工作人员
2.4 学生
2.5 其他人员

3、您知道乌岩岭保护区穿山甲多不多？
3.1 已灭绝
3.2 极度濒危
3.3 濒危
3.4 不濒危
3.5 不知道

4、您或您亲戚朋友的餐桌是否出现过穿山甲？
4.1 是
4.2 否

5、您食用、想食用穿山甲的原因是 （多选题）
5.1 新鲜、猎奇
5.2 一种普通食物
5.3 显示特殊身份，可带来优越感，炫耀心理
5.4 有特殊的药用价值或保健价值
5.5 风味独特，营养丰富
5.6 其他

6、您拒绝食用穿山甲的原因是（多选题）
6.1 违反国家相关法律
6.2 血腥、残忍
6.3 物种种群数量下降，破坏生态平衡
6.4 味道差，风味不佳
6.5 野生动物是传播人畜共患病的媒介
6.6 其他

7、您认为穿山甲的哪个价值对人类最重要？
7.1 经济价值
7.2 药用价值
7.3 食用价值
7.4 生态价值
7.5 皮革价值
7.6 观赏价值
7.7 其他

8、您是否支持穿山甲做为药材药用
8.1 支持
8.1 不支持
8.2 不知道

9、您日常通过哪些途径了解穿山甲保护的有关信息？（多选题）
9.1 书籍
9.2 电脑
9.3 微信（公众号新媒体）
9.4 学校知识
9.5 新闻
9.6 政府宣传
9.7 电视
9.8 其他

10、您愿意为乌岩岭保护区穿山甲做一些工作吗？
10.1 非常愿意
10.2 愿意
10.3 不愿意
10.4 无所谓

11、您认为可以怎样去保护穿山甲？（多选题）
11.1 增大执法力度
11.2 参与穿山甲保育的志愿工作
11.3 拒绝食用野生动物
11.4 保护动物的生存环境
11.5 劝告朋友，教育别人不食用穿山甲
11.6 其他

12、您认为可以怎么样去调动人们保护穿山甲的积极性（多选题）
12.1 宣传普及
12.2 展开相关知识的讲解活动
12.3 推出相应的周边商品与软件应用
12.4 成为一名保护志愿者
12.5 制作相应穿山甲保护主体的影视作品
12.6 其他

13、发现有人偷盗穿山甲或食用穿山甲，你会怎么做？
13.1 事不关己高高挂起
13.2 自己也参与其中，分享利益
13.3 马上报警举报
13.4 想要举报怕得罪人怕报复叫第三方报警

14、如果您举报，您知道向谁举报？(多选题)
14.1 森林公安局
14.2 110
14.3 120
14.4 119
14.5 其他

Journal of Threatened Taxa

www.threatenedtaxa.org

PLATINUM OPEN ACCESS

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

April 2020 | Vol. 12 | No. 5 | Pages: 15535–15674
Date of Publication: 26 April 2020 (Online & Print)
DOI: 10.11609/jott.2020.12.5.15535-15674

Publisher & Host

WILD ZOOREACH Threatened Taxa

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