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Cover: Digital illustration of *Impatiens chamchumroonii* in Krita by Dupati Poojitha.



## Local knowledge, attitudes, and perceptions of ecosystem services and disservices provided by the Painted Stork *Mycteria leucocephala* Pennant, 1769 (Aves: Ciconiidae) in northern India: insights for conservation

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**Abstract:** Understanding the knowledge, attitudes and perceptions of the local communities towards the target species before implementing any awareness-based programmes is essential for the success and long-term protection of the species. No studies have yet been conducted on local knowledge, attitudes, perceptions of ecosystem services and disservices, threats and possible recommendations for conservation of the Painted Stork *Mycteria leucocephala* in northern India. To fill this gap, a study was conducted in August–September 2024 in villages of Etawah District, Uttar Pradesh, India, where Painted Stork builds nests in farmland in human-dominated areas. The study employed a questionnaire survey, containing both closed and open-ended questions, administered to 200 respondents. All the respondents identified the species, and a majority knew its local name, breeding ecology, foraging ecology, and population trend. A majority of the people (52%) liked the species, supported conservation of the species (51%), felt the need for awareness programmes (52%), and were ready to participate in nest monitoring training (47%) & awareness programmes (58%). At the same time, a majority of the people were reluctant to report hunting (48%), reluctant to take the injured birds to veterinary doctors (46%), and lacked knowledge on the bird's conservation status (64%). People perceived 12 ecosystem services and five ecosystem disservices provided by Painted Stork, with pest control (50%) being the highest cited service and crop destruction (72%) the most cited disservice. According to the respondents, the highest threat to the species is wetland loss (59%). A majority recommended that conservation efforts should focus on organizing awareness programmes (52%) and implementing wetland management and conservation (50%). Furthermore, respondents believed the community should take the initiative in these efforts (48%). This study emphasizes intensified awareness programs, wetland conservation and management and protection of nesting trees, among other measures, to ensure the conservation of this species outside protected areas. It provides the essential baseline for conservationists, researchers, and policy makers to design effective conservation and management strategies involving local communities and policies for research and conservation of Painted Stork.

**Keywords:** Etawah, Farhadpura, human-dominated landscapes, nesting trees, questionnaire surveys, recommendations, socio-demography characteristics, threats, Usrai, Uttar Pradesh.

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**Author contributions:** Y-U conceived and designed the study, conducted fieldwork, and wrote the final draft of the manuscript. MS performed the field work, compiled the data and analyzed the data. Both authors read and approved the final manuscript.

**Hindi abstract:** See end of this article.

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## INTRODUCTION

Anthropogenic factors such as deforestation, urbanization, encroachment, human-wildlife negative interactions have driven the species to the brink of extinction and led to wildlife population declines (Taylor-Brown et al. 2019; Lewis et al. 2021; Lees et al. 2022). The scientific community has tried to invent many different possibilities, such as creating wildlife sanctuaries (Gorbunov et al. 2019; Volenec & Dobson 2020), restoration of degraded areas (Possingham et al. 2015; Volis 2019), and ex situ conservation (Canessa et al. 2015). But focusing on these techniques is not sufficient, as many of the threatened species are found in human-dominated landscapes (Bracebridge et al. 2013; Yashmita-Ulman et al. 2018; 2021a,b; Ceballos et al. 2019). The co-existence of people with wildlife is ultimately seen as a necessity to achieve wildlife conservation (Chakanyuka & Utete 2022), emphasizing the importance of the community's ecological knowledge and attitudes towards wildlife conservation (Gupta et al. 2023; Manigandan et al. 2024).

As locals interact with native species routinely, they have a good insight (Romero-Bautista et al. 2020) into the aspects of species distribution, breeding, diet, associated problems, services and threats (Gaston et al. 2018; Kross et al. 2018) as is the case with the Painted Stork *Mycteria leucocephala*, which is commonly seen foraging and building nesting colonies in the wetlands (Yashmita-Ulman 2022, 2023; Yashmita-Ulman & Singh 2022, 2025) and agricultural fields (Yashmita-Ulman & Singh 2021) in Uttar Pradesh. Understanding the local knowledge and involving the communities in the decision-making process can make them actively participate in conservation programmes. This can lead to the effective design of species conservation management strategies (Katuwal et al. 2021; Messina et al. 2023). Benefit sharing related to conservation-related activities can inculcate positive attitudes towards the species (Bajracharya et al. 2007), whereas events such as crop-raiding, livestock depredation, which are the costs related to conservation, develop negative attitudes towards the species (Mehta & Heinen 2001; Walpole & Goodwin 2001; Yashmita-Ulman et al. 2020). Evidence shows that communities hold negative attitudes towards birds such as Sarus Crane (Nevard et al. 2019), raptors (Dabone et al. 2022), Black-necked Crane (Zhong et al. 2023), for crop damage, making noise (Leong et al. 2020), and spreading disease (Green & Elmberg 2014). Certain communities also appreciate birds for their ecosystem services, such as decorative value (Baya Weaver, Yashmita-Ulman et al.

2017), scavenging (vultures, Morales-Reyes et al. 2018), pest-control (owls, Iniguez-Gallardo et al. 2024), aesthetic value (Sarus crane, Bhattarai et al. 2025), and revere them for their cultural values (Hooded vultures, Dabone et al. 2022). Therefore, the attitudes of the community towards the species need to be understood as these play an important role in the acceptance or rejection of conservation-related activities and management practices (Winter et al. 2005; Byju et al. 2024). The attitude of people towards a species is influenced by factors such as age, caste, gender, size of landholding, education, religion, and distance from forests (Arjunan et al. 2006; Ntuli et al. 2019). These attitudes can also be changed through organizing effective conservation programmes based on the prior understanding of the knowledge and attitudes of the community towards the species. For effective implementation of any community-based conservation activity, the first step is to understand the local knowledge, perceptions and attitudes of the local people towards the species in question.

The Painted Stork, locally known as Dhek, is an ibis-like stork with a long, tapering and drooping bill, 93–102 cm in length, and it weighs around 2–3.5 kg. It is distributed across southwestern Pakistan, India, and Sri Lanka, and into Indochina and southern China. It is found in shallow freshwater ecosystems such as lakes, marshlands, rivers, paddy fields, and wetlands (Cornell Lab of Ornithology 2025). It is a locally migratory species in Uttar Pradesh, and its breeding season lasts from August/September to February. The global population was estimated to be around 25,000 birds in 1994 (Cornell Lab of Ornithology 2025). The bird species has been upgraded to Schedule II, Part B of the Wildlife (Protection) Amendment Act, 2022 (WPAA 2022) from Schedule IV of the Wildlife (Protection) Act, 1972 (WPA 1972). Though the IUCN status of this bird is 'Least Concern' (IUCN 2025), it locally faces the threat of hunting, habitat loss, and degradation (Cornell Lab of Ornithology 2025). This species is mainly hunted for its meat and eggs (Cornell Lab of Ornithology 2025) as it forms a cheap source of protein for the local communities. In Uttar Pradesh, the Painted Stork prefers wetlands and agricultural fields for nesting (Tiwarly et al. 2014) and foraging, which are present in human-dominated landscapes, not under the direct control of the forest department but under the community governance, increasing the chances of hunting and habitat destruction that go unreported. The most effective way to protect this species and its nesting sites is to integrate its conservation and management with local communities and their livelihoods.

Many studies have been conducted in different

countries across the world that document the local knowledge and attitudes of people towards bird species conservation (Jacobson et al. 2003; Mmassy & Roskaft 2013; Cortes-Avizanda et al. 2018; Gaston et al. 2018; Kross et al. 2018; Katuwal et al. 2021, 2024; Zhong et al. 2023). In India, a handful of such studies exist on wildlife (Mir et al. 2015; Talukdar & Gupta 2018; Karanth et al. 2019; Gupta et al. 2023; Bhaskaran & Nilon 2025), and birds in particular (Acharya et al. 2009; Aiyadurai & Banerjee 2020; Aiyadurai et al. 2023; Tiwari et al. 2023; Das et al. 2025), but there are none specifically on Painted Stork. Considering the knowledge gap on the subject and the species, this study aims to assess: 1) people's ecological knowledge on Painted Stork, 2) their attitudes towards the species, 3) people's perception of threats faced by the species, 4) perceptions on ecological services and disservices provided by the Painted Stork, and 5) possible recommendations to conserve the species as suggested by the community.

## MATERIALS AND METHODS

### Study area

The field sites for this study are centred around the villages of Farhadpura (26.888° N & 79.161° E) and Usrai (Usrahar) (26.919° N & 79.034° E) (Figure 1), both situated within the Barhpura Block of the Etawah District in southwestern Uttar Pradesh. These localities are part of the Ganga-Yamuna Doab—a region defined by its position between the two major rivers, the Yamuna and its main tributary, the Chambal (KVK 2025). The district covers an area of approximately 2,311 km<sup>2</sup>, with the district headquarters in Etawah Town (GoUP 2025). The district experiences a sub-humid climate, with an average annual rainfall of about 792 mm, most of which falls between June and September during the southwest monsoon (KVK 2025). Temperatures peak in May, reaching daily maxima averaging up to 42 °C. Much of the area is agricultural, dominated by wheat, rice, and sugarcane crops (KVK 2025), but remnant patches of natural vegetation—especially along water bodies, agricultural fields and communal/village lands—serve as critical nesting sites for waterbirds. The Sarsai Nawar Wetland, recognized as a Ramsar site, lies in proximity and underlines the conservation importance of this region for waterbirds.

The Painted Stork is a colonial nester. In both the villages, these birds build nests on the trees of *Terminalia arjuna* and *Ficus religiosa* found in agricultural fields (Image 1).

### Method

The questionnaire surveys were carried out for two months, August–September 2024. Before starting with the formal data collection, an introductory informal group discussion was conducted with the residents of both the villages with the help of the village headman or gaon pradhan. Then, a preliminary pilot survey was carried out by interviewing 40 respondents, based on which a few improvements were made in the questionnaires. The respondents were also asked to list the benefits and problems caused by the Painted Stork. Based on these answers, a list of 12 ecosystem services and five ecosystem disservices were included in the final questionnaires. The ecosystem services were further classified into three sections, namely, regulation & maintenance, cultural, and provisioning services (Zhong et al. 2023). The improvised questionnaire had a set of closed and open-ended questions (See supplementary file S1) administered to 100 randomly selected respondents (as the nesting trees were in or around agricultural fields) from each village, making a total of 200 respondents. The questions asked were pertaining to 1) knowledge on Painted Stork (species identification, local name, habitat, nesting trees, breeding season, foraging locations, diet, population fluctuations over the years, conservation status of species), 2) attitudes towards Painted Stork (thought of it as a harmful species, whether they liked the species, supported its conservation, whether they cut its nesting trees, opinions on need for awareness programmes, willingness to participate in nest monitoring training programmes and awareness programmes, report hunting, take injured birds to veterinary doctor), 3) threats faced as perceived by people, 4) recommendations to conserve the species as suggested by people, and 5) perceptions of ecosystem services and disservices provided by the species (respondents were asked to choose between the 12 ecosystem services namely pest control, eats snakes and nutrient cycling under regulation and maintenance ecosystem service, medicinal value and meat value under provisioning ecosystem service, sense of pride, existence value, aesthetic value, conservation value, conservation flagship, educational value and ecotourism under cultural ecosystem service and five ecosystem disservices namely destroys crops, eat fishes, makes noise, makes area dirty and spreads diseases). To establish whether the participants could identify the species and its local name, a photo-elicitation approach was used during the surveys. Before the start of every interview, the verbal consent of the respondents was taken, and they were informed that the data would be used only for research purposes. The interviews were

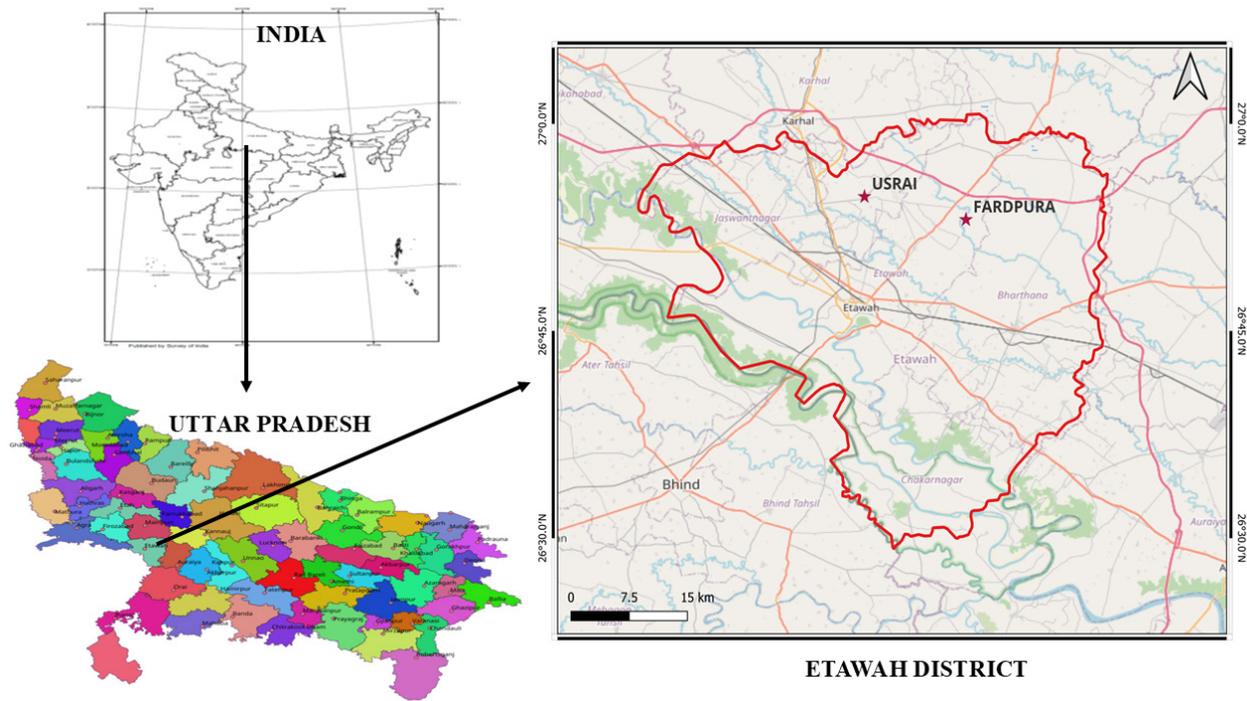


Figure 1. Map of the study area.



Image 1. Nesting locations showing nesting trees and nests of Painted Stork in Usrai and Farhadpura villages of Etawah District, Uttar Pradesh. © Manoj Singh & Rajesh Kumar.

conducted in the local Hindi language using simple local terms. Each interview took approximately 40 minutes to complete. For data analysis, the respondent's knowledge about the species was evaluated by marking one point for each correctly answered question and zero points for each wrong answer.

## RESULTS AND DISCUSSION

### Socio-demographic characteristics of respondents

Out of the 200 respondents, 66% (n = 132) were male, and 34% (n = 68) were female (Table 1). The respondents' ages ranged from 16–85 years, with the majority falling within the age range of 25–54 (Table 1). The majority of the respondents were engaged in agriculture and received secondary level education till 12<sup>th</sup> class (Table 1).

### Respondent's ecological knowledge about the species

All the respondents were able to identify the Painted Stork, and more than half knew its local name (Figure 2). While most respondents could not correctly identify the bird's habitats, they were knowledgeable about the breeding season and preferred nesting trees of the species. The respondents mentioned that the Painted Storks arrive during the Diwali season (i.e., September/October) and avoid nesting on sacred Peepal *Ficus religiosa* trees used for prayer. Most of the respondents knew that wetlands and agricultural lands were the species' most preferred foraging sites, and that the species fed on fish, snakes, crustaceans, snails, shrimps, crabs, insects, and frogs. The familiarity of the local people with this species might be because the Painted Stork has an attractive appearance, a huge body and builds nests in and around farmlands and wetlands, close to human habitations. Similarly, many other studies have reported that people possess good knowledge of birds around them (Mmassy & Roskaft 2013; Katuwal et al. 2024; Das et al. 2025; Nima et al. 2025). The findings also report declines in the population of species (Figure 2), which might be due to the comparison with their past experiences. Interestingly, the population trend of this species shows that its population is increasing (BirdLife International 2025), suggesting a local decline in the species population. The majority of the people were unaware of the conservation status of the species and did not know its habitat (Figure 2), which also shows the knowledge gap. Some studies have reported that educated people have greater awareness of the conservation status of birds and their habitat (Ortega-Lasuen et al. 2023; Katuwal et al. 2024).

### Respondent's attitudes towards the species

Amongst the respondents, 44% (n = 87) perceived the Painted Stork as a harmful species (Figure 3), primarily because its excreta fell on and destroyed crops. The majority of villagers supported species conservation and cherished the birds (Figure 3), as they were accustomed to living with them like family members and appreciated their elegant appearance. Furthermore, the respondents agreed that awareness programmes were necessary and expressed readiness to participate in nest monitoring and awareness programmes (Figure 3), consistent with findings from a study on the Sarus Crane in Nepal (Bhattarai et al. 2025). Nearly an equal number of people agreed and disagreed about taking injured birds to the veterinarians, with many refusing to report hunting (Figure 3). This reluctance likely stems from a desire to avoid legal repercussions. Consequently, hunting in villages remains underreported, causing this threat to rise slowly.

### Perceived threats to the species

According to the opinion of the respondents, the highest threat faced by the Painted Stork is wetland loss and hunting (Figure 4). Similar threats have been reported by Herzon & Mikk (2007), Stanton et al. (2018) and Katuwal et al. (2021). Villagers confirmed that most wetlands were encroached upon for agricultural expansion and that this species was hunted for meat. During our field visits, some people were seen pelting stones at the chicks

**Table 1. Socio-demography of the respondents who participated in the interviews.**

Variables	Categories	Number (N)	Percentage (%)
Gender	Male	132	66
	Female	68	34
Age	Early working age (16–24)	37	18
	Prime working age (25–54)	78	39
	Mature working age (55–64)	61	31
	Elderly age group (> 65)	24	12
Educational Attainment	Illiterate (no formal education)	29	15
	Primary level (< 8 class)	46	23
	Secondary level (9–12 class)	74	37
Occupation	Bachelor & above	51	25
	Agriculture	113	57
	Business	34	17
	Government job	20	10
	Private job	29	14
	Others	4	2

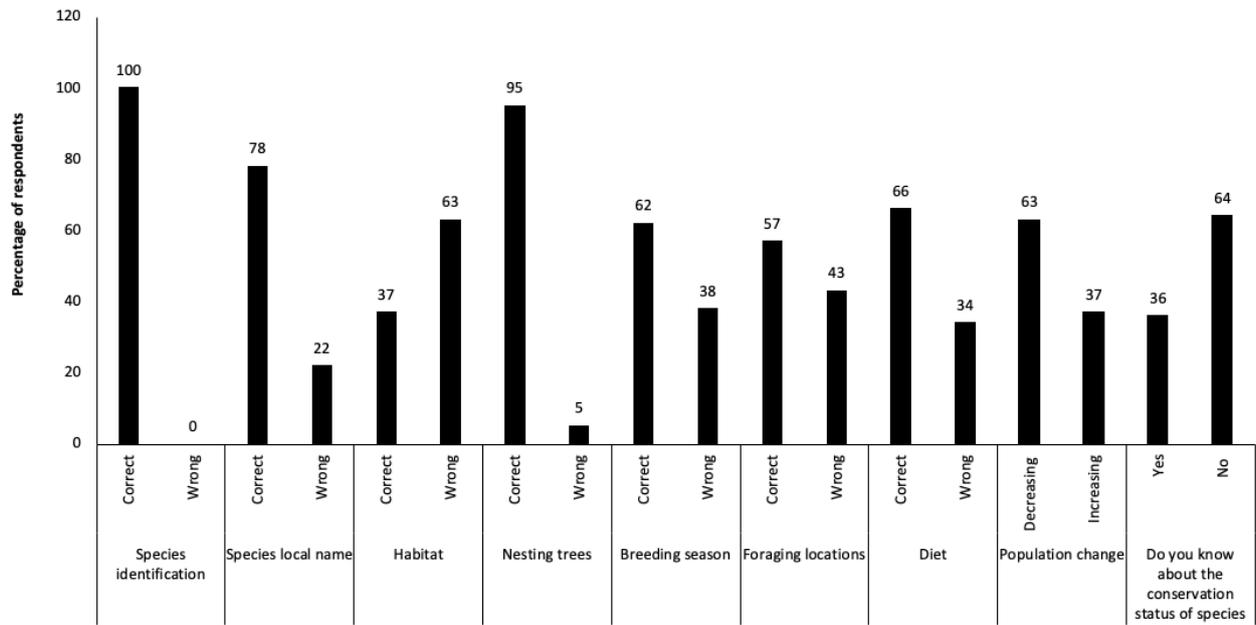


Figure 2. Respondent’s knowledge on the Painted Stork.

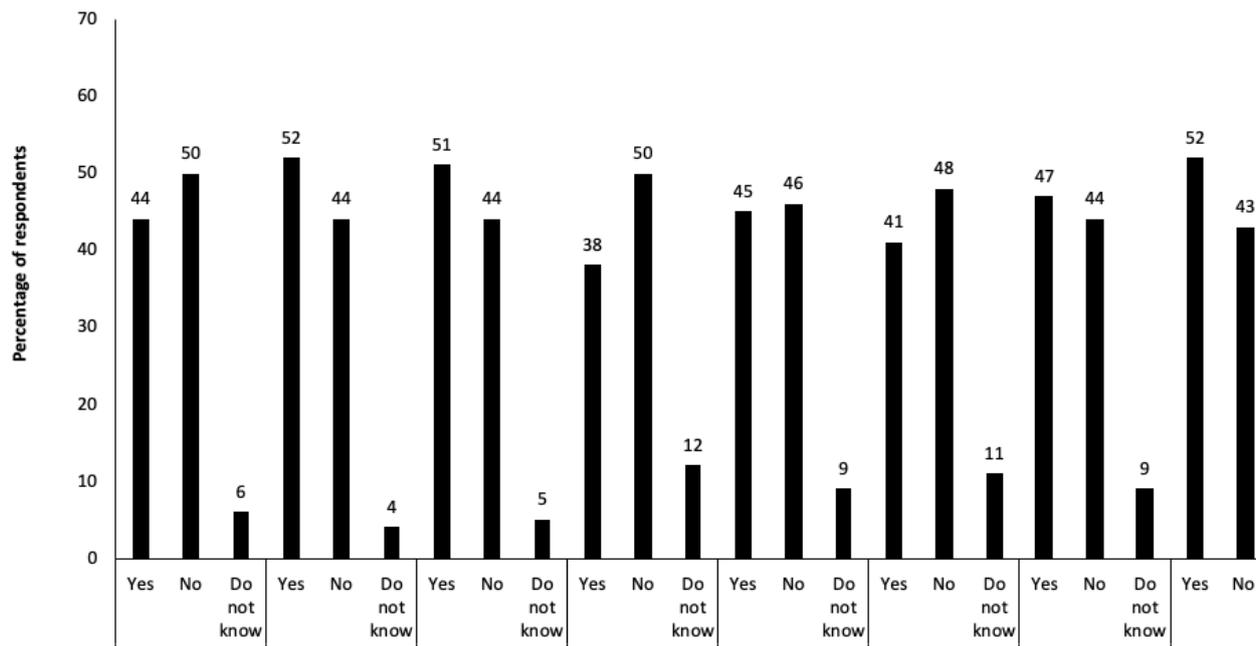


Figure 3. Respondents attitudes towards Painted Stork.

in the nest. There are reports that confirm this species is hunted for food (BirdLife International 2025). Although we observed one instance where a tree was cut down to avoid nesting, while a few villagers confirmed this during surveys, the majority denied it.

**Perceived ecosystem services and disservices**

In all, the respondents recognised 12 ecosystem services (three regulation and maintenance ecosystem services, two provisioning ecosystem service and seven cultural ecosystem services) and five ecosystem disservices (Figures 5 & 6). The most-cited regulation and maintenance ecosystem service was pest control;

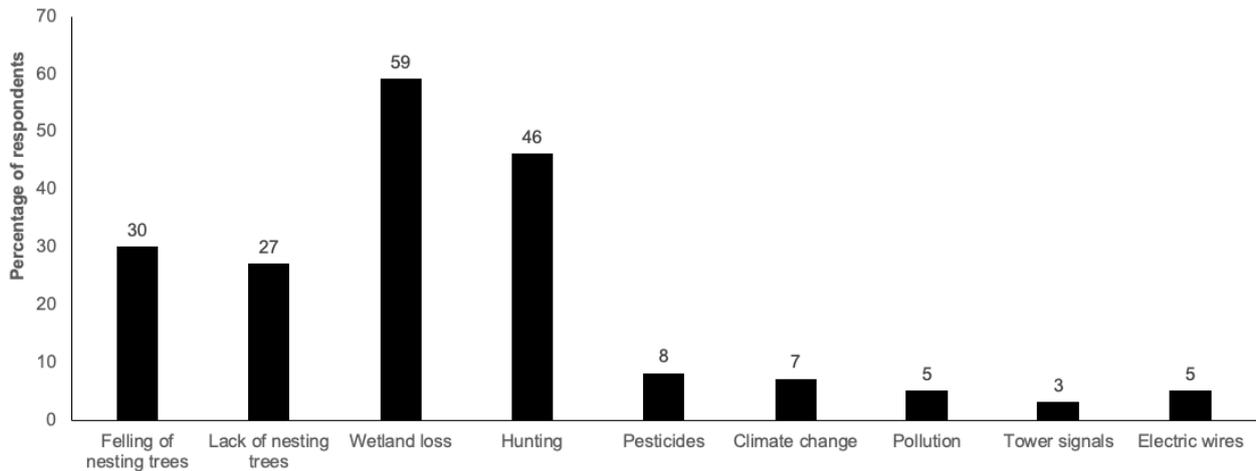


Figure 4. Threats faced by Painted Stork as perceived by the respondents.

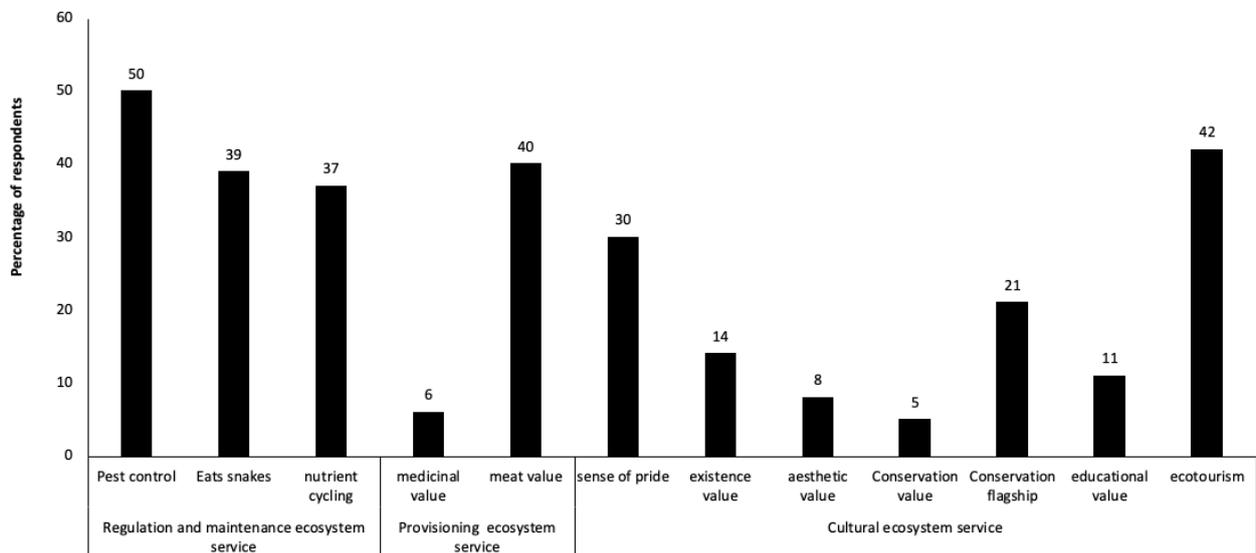


Figure 5. Perceived ecosystem services provided by Painted Stork.

the most-cited provisioning ecosystem service was meat value, and the most-cited cultural ecosystem service was ecotourism (Figure 5). Because the diet of the Painted Stork consists of agricultural pests – including insects, snails (Ali & Ripley 1987; Parasharya & Naik 1990; Sridhar et al. 2002; Urfi 2002), and snakes (Urfi 1988) – humans might appreciate this bird’s role as a natural predator. The positive attitude towards this species might also have been developed as people acknowledged the ecosystem services provided by the Painted Stork (Whelan et al. 2008; Mariyappan et al. 2023). The most-cited ecosystem disservices were crop destruction and fish predation (Figure 6). Bird excreta that drop on nesting trees and crops below (observed by Yashmita-Ulman) form a white layer on leaves, disrupting photosynthesis and reducing

crop yield. Since the species is primarily piscivorous (Urfi 2011), this predation on fish—a food source for local people—results in human-wildlife negative interactions. The number of services and disservices mentioned by each respondent ranged 1–3, with the majority citing one ecosystem service in each category (Figures 7, 8, & 9) and two ecosystem disservices (Figure 10).

**Conservation implications**

The majority of respondents suggested conservation measures such as organizing awareness programs, wetland management and conservation, establishment of protected areas, and hunting control (Figure 11). The respondents strongly believed that the community should take the initiative for species conservation,

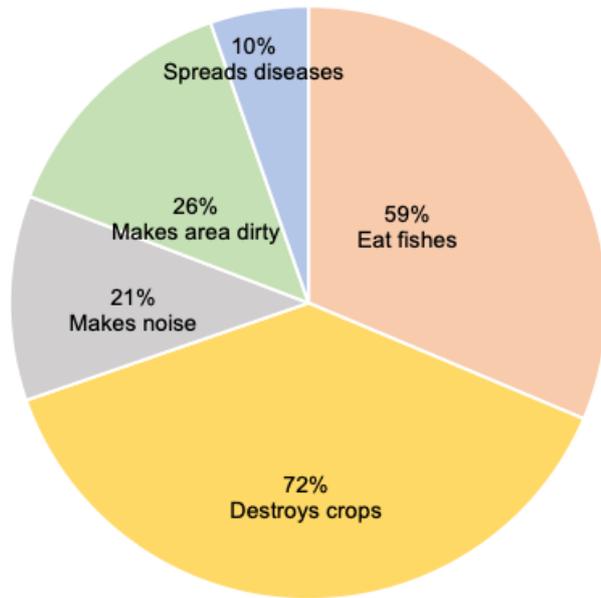


Figure 6. Perceived ecosystem disservices provided by Painted Stork.

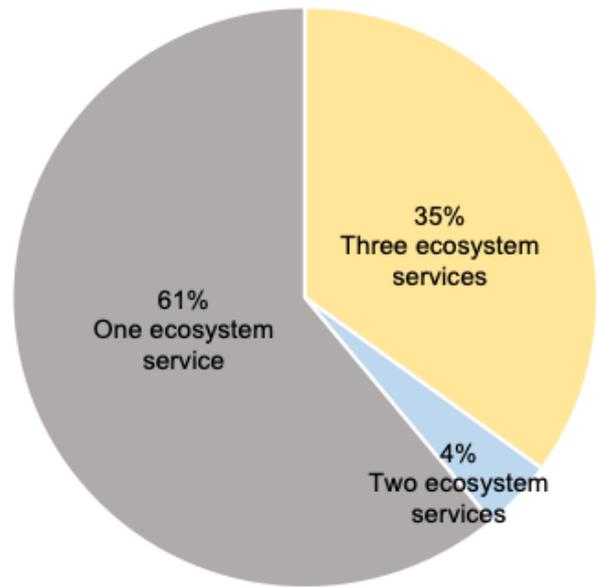


Figure 7. Number of regulation and maintenance ecosystem services provided by Painted Stork as perceived by respondents.

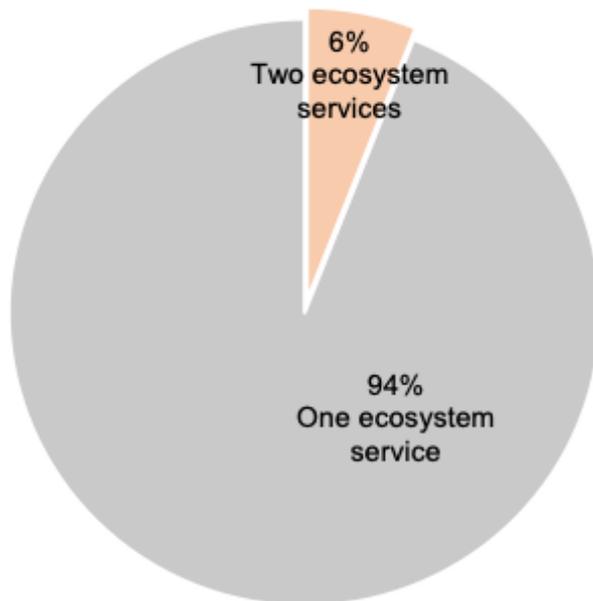


Figure 8. Number of provisioning ecosystem services provided by Painted Stork as perceived by respondents.

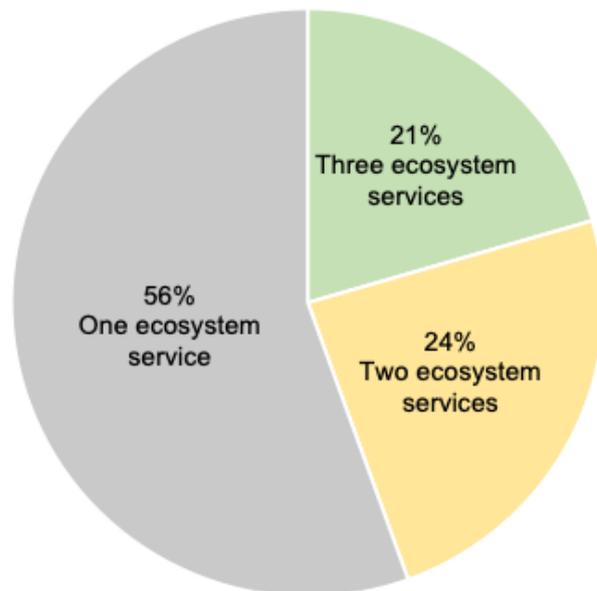


Figure 9. Number of cultural ecosystem services provided by Painted Stork as perceived by respondents.

consistent with findings from the study on Sarus Crane in Nepal (Bhattarai et al. 2025).

### CONCLUSION

The ecological knowledge, attitudes, and conservation recommendations of the local people revealed through

this study increase the chances of positive impacts from awareness activities in this area. This positive mindset is necessary for species conservation in human-dominated landscapes. The government, along with the non-governmental organizations working in this region, must take immediate steps to spread awareness and provide incentives to the people involved in the conservation of this species. Policies must be framed

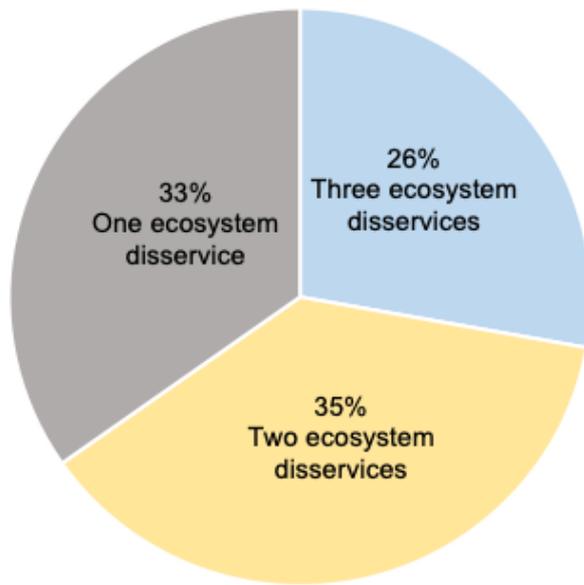


Figure 10. Number of ecosystem disservices provided by Painted Stork as perceived by respondents.

such that people are encouraged to protect and plant the preferred nesting trees of the Painted Stork, such as *Ficus religiosa*, *Syzygium cumini*, and *Terminalia arjuna* report hunting activities and manage wetlands sustainably. This study provides the first-ever insight into people’s knowledge, attitudes, perceptions of ecosystem services and disservices provided by the Painted Stork from northern India. This study provides the baseline data for further field-based research aimed at understanding the interaction dynamics between birds and humans outside protected areas.

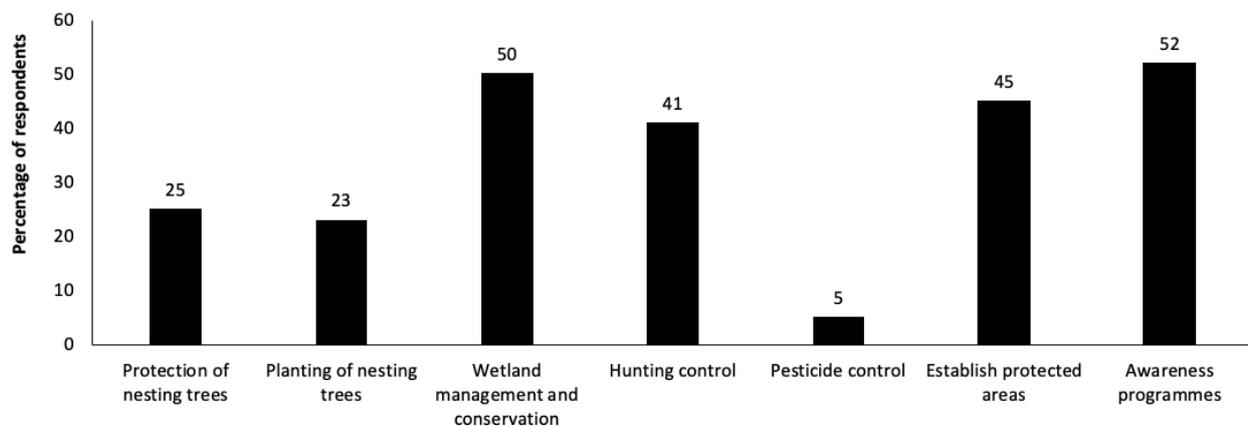


Figure 11. Conservation measures suggested by the respondents.

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Hindi: किसी भी जागरूकता कार्यक्रम को शुरू करने से पहले उस प्रजाति के बारे में स्थानीय समुदायों के ज्ञान, सोच और हिचकण को समझना बहुत जरूरी होता है। इससे उस प्रजाति की सफलता और लंबे समय तक संरक्षण सुनिश्चित किया जा सकता है। उत्तर भारत में पेन्टेड स्टॉक (माइग्रेटोरिया ल्यूकोसेफाला) के बारे में स्थानीय लोगों के ज्ञान, उनके विचार, पारिस्थितिकी सेवारों व हानियाँ, खतरों और संरक्षण के सुझावों पर अब तक कोई अध्ययन नहीं किया गया था। इस कमी को पूरा करने के लिए अगस्त-सितंबर 2024 में उत्तर प्रदेश के इटावा जिले के गाँवों में एक अध्ययन किया गया। यहाँ पेन्टेड स्टॉक मानव बस्तियों के पास शेताओं में घोंसला बनाते हैं। इस अध्ययन में 200 लोगों से प्रश्नावली के माध्यम से जानकारी ली गई, जिसमें बंद और खुले दोनों प्रकार के प्रश्न शामिल थे। सभी उत्तरदाताओं ने इस पक्षी की पहचान की। अधिकांश लोग इसका स्थानीय नाम, प्रजनन व्यवहार, भोजन खोजने की आदतों और इसकी जनसंख्या की स्थिति के बारे में जानते थे। अधिकांश लोगों (52%) को यह पक्षी पसंद है। 51% लोग इसके संरक्षण के पक्ष में थे। 52% लोगों ने जागरूकता कार्यक्रमों की आवश्यकता महसूस की। 47% लोग घोंसला निगरानी प्रशिक्षण में भाग लेने के लिए तैयार थे और 58% लोग जागरूकता कार्यक्रमों में शामिल होने के इच्छुक थे। दूसरी ओर, कई लोग शिकार की सूचना देने में हिचकियाते थे (48%), घायल पक्षियों को पशु चिकित्सक के पास ले जाने में भी संकोच करते थे (46%), और 64% लोगों को इस पक्षी की संरक्षण स्थिति की सही जानकारी नहीं थी। लोगों ने पेन्टेड स्टॉकसे जुड़ी 12 पारिस्थितिकी सेवाओं और 5 पारिस्थितिकी हानियों को पहचाना। कीट नियंत्रण (50%) को सबसे अधिक लाभ के रूप में बताया गया, जबकि फसलों को नुकसान (72%) को सबसे बड़ी हानि माना गया। उत्तरदाताओं के अनुसार इस प्रजाति के लिए सबसे बड़ा खतरा आर्द्रमृत्तियों का नष्ट होना है (59%)। अधिकांश लोगों ने सुझाव दिया कि संरक्षण के प्रयासों में जागरूकता कार्यक्रम (52%) और आर्द्रमृत्ति प्रबंधन व संरक्षण (50%) पर ध्यान दिया जाना चाहिए। 48% लोगों का मानना था कि इन प्रयासों की शुरुआत स्वयं समुदाय को करनी चाहिए। यह अध्ययन दर्शाता है कि संरक्षित क्षेत्रों के बाहर भी इस प्रजाति के संरक्षण के लिए जागरूकता कार्यक्रमों को बढ़ाना, आर्द्रमृत्तियों का संरक्षण और प्रबंधन करना तथा घोंसले वाले पेड़ों की सुरक्षा करना बहुत आवश्यक है। यह अध्ययन संरक्षणकर्ताओं, शोधकर्ताओं और नीति निर्माताओं को स्थानीय समुदायों की भागीदारी के साथ प्रभावी संरक्षण रणनीति बनाने के लिए आधार प्रदान करता है।

## Appendix 1. Questionnaire.

Name of Respondent:..... Age:..... Sex:.....  
 District:..... Village name:..... Date:.....  
 Occupation:..... Education: ..... Caste: .....

### A. Knowledge on Lesser Adjutant

1. Have you seen this species? (Showing Photo of Painted Stork) .....
2. Do you know the name of this species? Yes..... No..... If yes, name it.....
3. In which habitat you saw mostly? .....
4. In which trees does this species nest? .....
5. What is its breeding season? .....
6. Where does it feed/eat?.....
7. What does it eat?.....
8. Has the species population increased or decreased over the years? .....
9. Do you know about the species conservation status? .....

### B. Attitudes towards the species

10. Is the species harmful?  
 a) Yes      b) No      c) Don't know
11. Whether you like the species?  
 a) Yes      b) No      c) Don't know
12. Do you support the conservation of Painted Stork?  
 a) Yes      b) No      c) Don't know
13. Do you cut the nesting trees of Painted Stork if it makes nests?  
 a) Yes      b) No      c) Don't know
14. If injured, will you take the bird to a veterinary doctor?  
 a) Yes      b) No      c) Don't know
15. If hunting is found, will you inform Forest Department?  
 a) Yes      b) No      c) Don't know
16. Will you be ready to get trained in Painted stork nest monitoring?  
 a) Yes      b) No      c) Don't know
17. Is there any need for awareness programmes?  
 a) Yes      b) No      c) Don't know
18. Will you participate in awareness programmes?  
 a) Yes      b) No      c) Don't know

### C. Conservation issues related to the species

19. In your opinion which different threats is the species facing?  
 a) Wetland loss      b) Hunting      c) Felling of nesting trees      d) Lack of nesting trees      e) Pesticides  
 f) Climate change      g) Pollution      h) Tower signals      i) Electric wires
20. Have you seen people hunting Painted stork? .....
21. How do people hunt it (method)? .....
22. Have you seen people taking eggs and chicks from the nest? .....
23. Who among the following do you think must take initiative to conserve Painted Stork?  
 a) Government      b) NGO      c) International organization      d) Community
24. In your opinion which different measures will lead to conservation of Painted Stork?  
 a) Organizing awareness programme      b) Wetland management and conservation      c) Establishment of protected areas  
 d) Hunting control      e) Protection of nesting trees      f) Pesticide control

### D. Farmers' perceptions of services and disservices

25. In your opinion, which of the following regulation and maintenance benefits do you think the Painted stork provides?  
 a) pest control      b) eats snakes      c) nutrient cycling      d) any other .....
26. In your opinion, which of the following provisioning benefits do you think the Painted stork provides?  
 a) medicinal value      b) meat value      c) any other .....
27. In your opinion, which of the following cultural benefits do you think the Painted stork provides?  
 a) sense of pride      b) existence value      c) aesthetic value      d) conservation value      e) conservation flagship  
 f) educational value      g) ecotourism      h) any other .....
28. In your opinion, which of the following damage is caused due to Painted stork?  
 a) eats fishes      b) destroys crops      c) makes noise      d) makes area dirty      e) spreads diseases  
 f) any other .....

## परिशिष्ट – 1 : प्रश्नावली

उत्तरदाता का नाम: .....

आयु: ..... लिंग: .....

जिला: ..... गाँव का नाम: ..... दिनांक: .....

व्यवसाय: ..... शिक्षा: ..... जाति: .....

## A. प्रजाति (पेंटेड स्टॉर्क) के बारे में ज्ञान

1. क्या आपने इस प्रजाति को देखा है? (पेंटेड स्टॉर्क का फोटो दिखाकर) .....
2. क्या आप इस प्रजाति का नाम जानते हैं?  
 हाँ  नहीं यदि हाँ, तो नाम लिखें: .....
3. आपने इसे अधिकतर किस प्रकार के आवास (हैबिटेट) में देखा है? .....
4. यह प्रजाति किन पेड़ों पर घोंसला बनाती है? .....
5. इसका प्रजनन काल (ब्रीडिंग सीज़न) कौनसा है? .....
6. यह कहाँ भोजन करती है? .....
7. यह क्या-क्या खाती है? .....
8. आपके अनुसार पिछले वर्षों में इस प्रजाति की संख्या बढ़ी है या घटी है? .....
9. क्या आप इस प्रजाति की संरक्षण स्थिति के बारे में जानते हैं? .....

## B. प्रजाति के प्रति दृष्टिकोण (Attitude)

10. क्या यह प्रजाति हानिकारक है?  
 हाँ  नहीं  नहीं जानते
11. क्या आपको यह प्रजाति पसंद है?  
 हाँ  नहीं  नहीं जानते
12. क्या आप पेंटेड स्टॉर्क के संरक्षण का समर्थन करते हैं?  
 हाँ  नहीं  नहीं जानते
13. यदि यह प्रजाति किसी पेड़ पर घोंसला बनाती है, तो क्या आप उस पेड़ को काटते हैं?  
 हाँ  नहीं  नहीं जानते
14. यदि पक्षी घायल मिले, तो क्या आप उसे पशु-चिकित्सक के पास ले जाएँगे?  
 हाँ  नहीं  नहीं जानते
15. यदि शिकार की घटना दिखे, तो क्या आप वन विभाग को सूचना देंगे?  
 हाँ  नहीं  नहीं जानते
16. क्या आप पेंटेड स्टॉर्क के घोंसला-निगरानी (Nest Monitoring) का प्रशिक्षण लेने के लिए तैयार हैं?  
 हाँ  नहीं  नहीं जानते
17. क्या आपको लगता है कि जागरूकता कार्यक्रमों की आवश्यकता है?  
 हाँ  नहीं  नहीं जानते
18. क्या आप जागरूकता कार्यक्रमों में भाग लेंगे?  
 हाँ  नहीं  नहीं जानते

**C. प्रजातियों से संबंधित संरक्षण मुद्दे**

19. आपके अनुसार यह प्रजाति किन-किन खतरों का सामना कर रही है?
- आर्द्रभूमि (वेटलैंड) का नुकसान
  - शिकार
  - घोंसला-पेड़ों की कटाई
  - घोंसला-पेड़ों की कमी
  - कीटनाशक
  - जलवायु परिवर्तन
  - प्रदूषण
  - मोबाइल/टावर सिग्नल
  - विद्युत तार
20. क्या आपने किसी को पेंटेड स्टॉक का शिकार करते देखा है? .....
21. लोग इसे किस तरीके से शिकार करते हैं? .....
22. क्या आपने लोगों को घोंसले से अंडे या चूजे लेते देखा है? .....
23. आपके अनुसार पेंटेड स्टॉक के संरक्षण की पहल किसे करनी चाहिए?
- सरकार  गैर-सरकारी संगठन (NGO)
  - अंतरराष्ट्रीय संगठन  स्थानीय समुदाय
24. आपके अनुसार कौन-कौन से उपाय पेंटेड स्टॉक के संरक्षण में सहायक होंगे?
- जागरूकता कार्यक्रमों का आयोजन
  - आर्द्रभूमि प्रबंधन एवं संरक्षण
  - संरक्षित क्षेत्रों की स्थापना
  - शिकार पर नियंत्रण
  - घोंसला-पेड़ों का संरक्षण
  - कीटनाशकों पर नियंत्रण

**D. किसानों की सेवाओं एवं असुविधाओं के प्रति धारणा**

25. आपके अनुसार पेंटेड स्टॉक कौन-कौन सी **नियामक एवं रखरखाव सेवाएँ** प्रदान करता है?
- कीट नियंत्रण
  - साँप खाता है
  - पोषक तत्व चक्र (न्यूट्रिएंट साइकिलिंग)
  - अन्य (कृपया लिखें): .....
26. आपके अनुसार पेंटेड स्टॉक कौन-कौन से **उपयोगी लाभ (Provisioning Benefits)** प्रदान करता है?
- औषधीय मूल्य
  - मांस मूल्य
  - अन्य (कृपया लिखें): .....
27. आपके अनुसार पेंटेड स्टॉक के **सांस्कृतिक लाभ** क्या हैं?
- गर्व की भावना
  - अस्तित्व मूल्य
  - सौंदर्यात्मक मूल्य
  - संरक्षण मूल्य
  - संरक्षण का प्रतीक (फलैंगशिप)
  - शैक्षणिक मूल्य
  - ईको-पर्यटन
  - अन्य (कृपया लिखें): .....
28. आपके अनुसार पेंटेड स्टॉक से कौन-कौन सी **हानियाँ/असुविधाएँ** होती हैं?
- मछली खाता है
  - फसल को नुकसान
  - शोर करता है
  - क्षेत्र को गंदा करता है
  - रोग फैलाता है
  - अन्य (कृपया लिखें): .....

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