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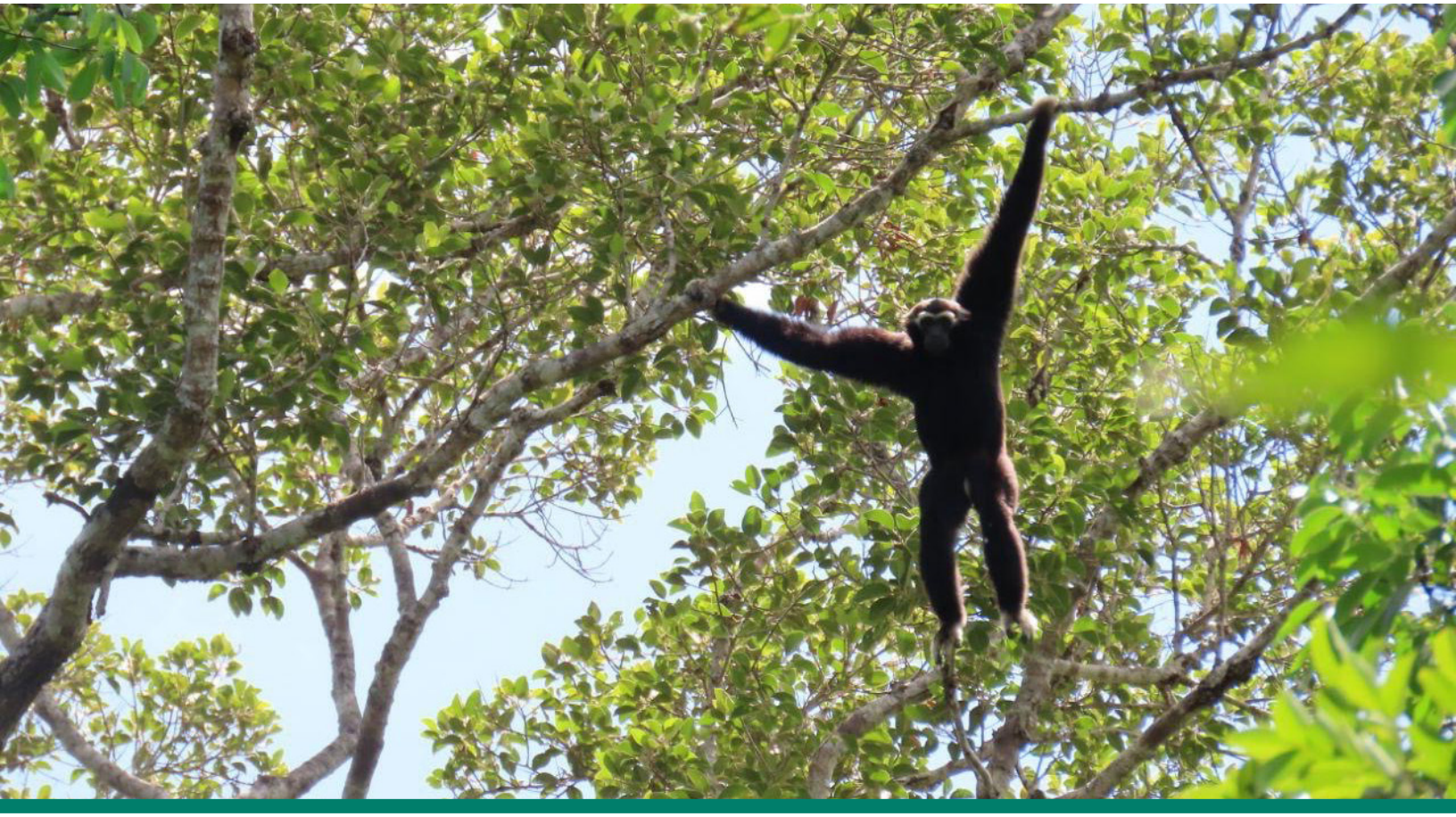

Pileated Gibbons of Cambodia's Prey Lang Wildlife Sanctuary

New Findings from a Global Refuge

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Contents

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Allied Insights is Wild Earth Allies' platform for sharing research, field learnings, and new thinking from our collaborative conservation work around the world. Grounded in local values and co-created with trusted partners, each installment explores how culturally aligned, place-based approaches can help turn the tide of biodiversity loss. This is where evidence meets action, and shared wisdom becomes a tool for global impact.

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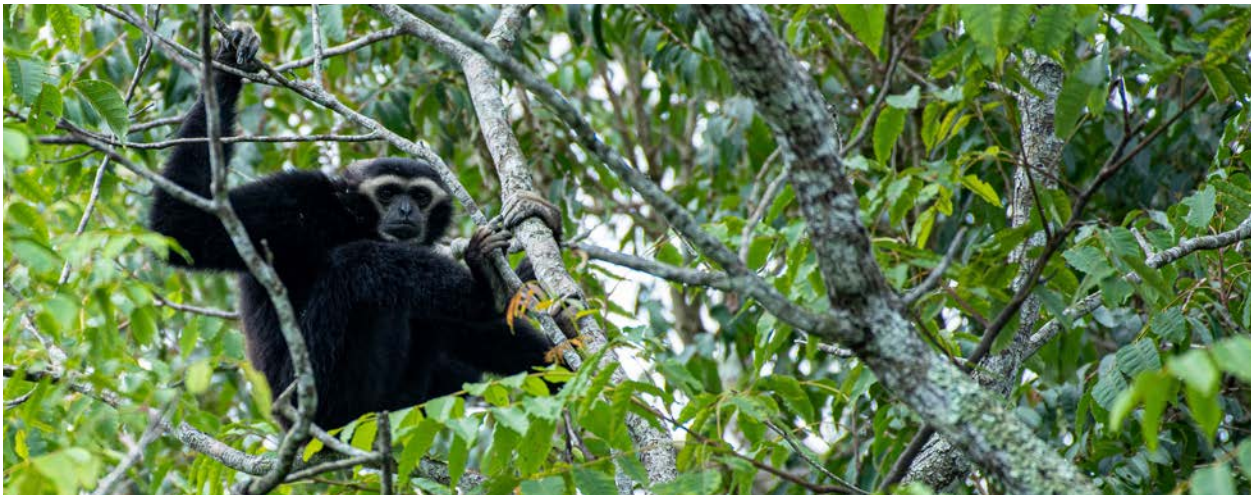
Executive Summary

As part of Wild Earth Allies' Allied Insights series, this report presents the most comprehensive assessment to date of endangered pileated gibbons (*Hylobates pileatus*) in Cambodia's Prey Lang Wildlife Sanctuary, with a focus on their population status and diet. This work is led by our Conservation Manager, Neang Thy, in collaboration with the Stung Treng Department of Environment and Indigenous Kuy community members. This project is part of our overall program goal in Prey Lang to strengthen forest management and protect at-risk wildlife in ways that integrate cultural values and enrich local livelihoods.

Half of the world's pileated gibbons have disappeared in the past 50 years. Today, an estimated 47,000 gibbons remain—and more than two-thirds are in Cambodia. Prey Lang, a vast lowland evergreen forest, is critical habitat where past surveys estimated 10,000 gibbons. Despite this population's global significance, Prey Lang went unsurveyed for two decades. During this time, the forest faced increasing pressures from illegal logging and unsustainable management. Because pileated gibbons depend on intact evergreen forest to thrive, our team identified an urgent need for an updated population assessment.

In 2021, we launched a monitoring project to assess the population status of pileated gibbons in Prey Lang Wildlife Sanctuary. Our initial surveys focused on a core habitat area in Stung Treng province, where the evergreen forest is most intact. There, our surveys revealed an estimated 5,900 gibbons—more than expected and at higher densities than ever recorded. Since this area covers less than a quarter of the total sanctuary, our finding suggests a higher gibbon population in Prey Lang than previously thought. To investigate, we are expanding surveys to additional evergreen forest areas in the sanctuary. Early results suggest gibbon numbers are similar across this key habitat type, leading us to a preliminary estimate of at least 12,000 pileated gibbons in the wildlife sanctuary. As we continue surveys to refine this estimate, one message is clear: Prey Lang is a global stronghold for this endangered ape.



A male pileated gibbon looks out from the canopy.

> “Our surveys show that Prey Lang is a crucial refuge, not just for Cambodia but for the survival of pileated gibbons in our world.”
>
> NEANG THY

Our team also designed and implemented a diet study to better understand the food preferences and habitat requirements of Prey Lang’s gibbons. Over four field seasons, we documented gibbons eating fruits, leaves, and flowers from 62 different plant species. Over 80% of these plants are also valued by Indigenous Kuy and other local communities for food, medicine, and income. For example, gibbons were observed feeding on dipterocarp trees, and local communities also collect resin from these trees as a primary livelihood strategy. Our findings are now informing our Gibbon Trees project, which uses seeds collected from gibbon dung to grow plants important to both gibbons and people in community-managed nurseries.

Looking ahead, our team will expand surveys to refine the total pileated gibbon population estimate in this vital refuge. We will also deepen research on gibbon ecology and map priority habitats for targeted protection. All research findings are shared with the Ministry of Environment to guide management planning and gibbon conservation strategies in Prey Lang. With Indigenous Kuy partners, we are also growing our Gibbon Trees project to restore degraded habitat and increase community access to valued natural resources.

Our pileated gibbon conservation project underscores our commitment to conservation rooted in local values, knowledge, and practices. This collaborative work between Wild Earth Allies, Cambodia’s Ministry of Environment, and Indigenous Kuy communities is a tangible example of how we form deep partnerships, co-create knowledge, and invest strategically to ensure local conservation action is seen, heard, and well-funded. Together, we can conserve vital landscapes where local action is turning the tide of biodiversity loss that affects us all.

Gibbon Trees grow in a nursery in Prey Lang.

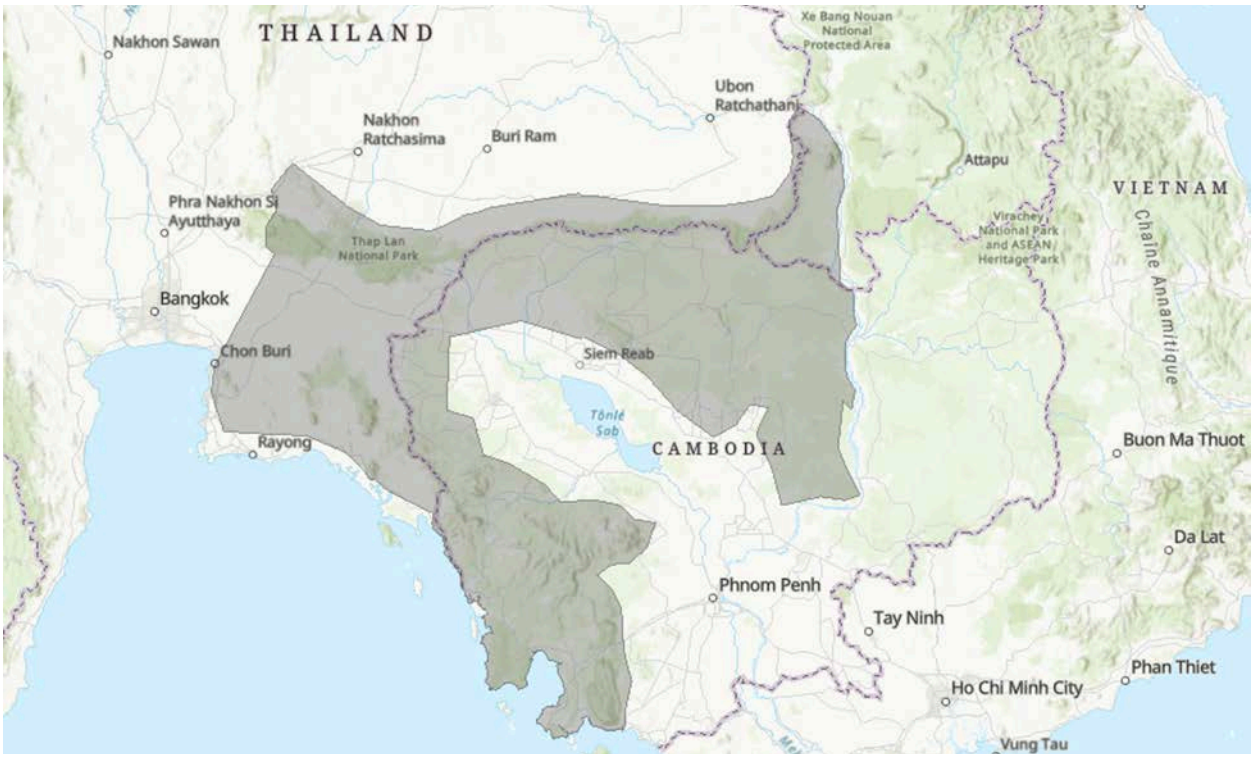
Background

Pileated Gibbons: Global Status

Since 1970, we have lost half the world's pileated gibbons (*Hylobates pileatus*). Now endangered, their numbers are continuing to decline, primarily from hunting pressures and habitat loss across their range in Cambodia, Thailand, and the Lao People's Democratic Republic (Map 1). As of 2020, an estimated 47,000 mature individuals remain globally.[1]

Cambodia is home to most of our world's remaining pileated gibbons with an estimated 35,000 individuals. This estimate is based on the last large-scale effort in 2002-2003 to survey pileated gibbons in Cambodia. At that time, gibbons were found primarily in two forested landscapes: the Cardamom Mountains and Prey Lang, where the survey authors roughly estimated 20,000 and 10,000 gibbons, respectively.[2] Crucially, these two populations were considered large enough to be viable and resilient in their intact forest environments.

Map 1: Where are the world's pileated gibbons?[3]



1 Brockelman, W, Geissmann, T., Timmins, T. & Traeholt, C. (2020). Hylobates pileatus. The IUCN Red List of Threatened Species 2020: e.T10552A17966665.

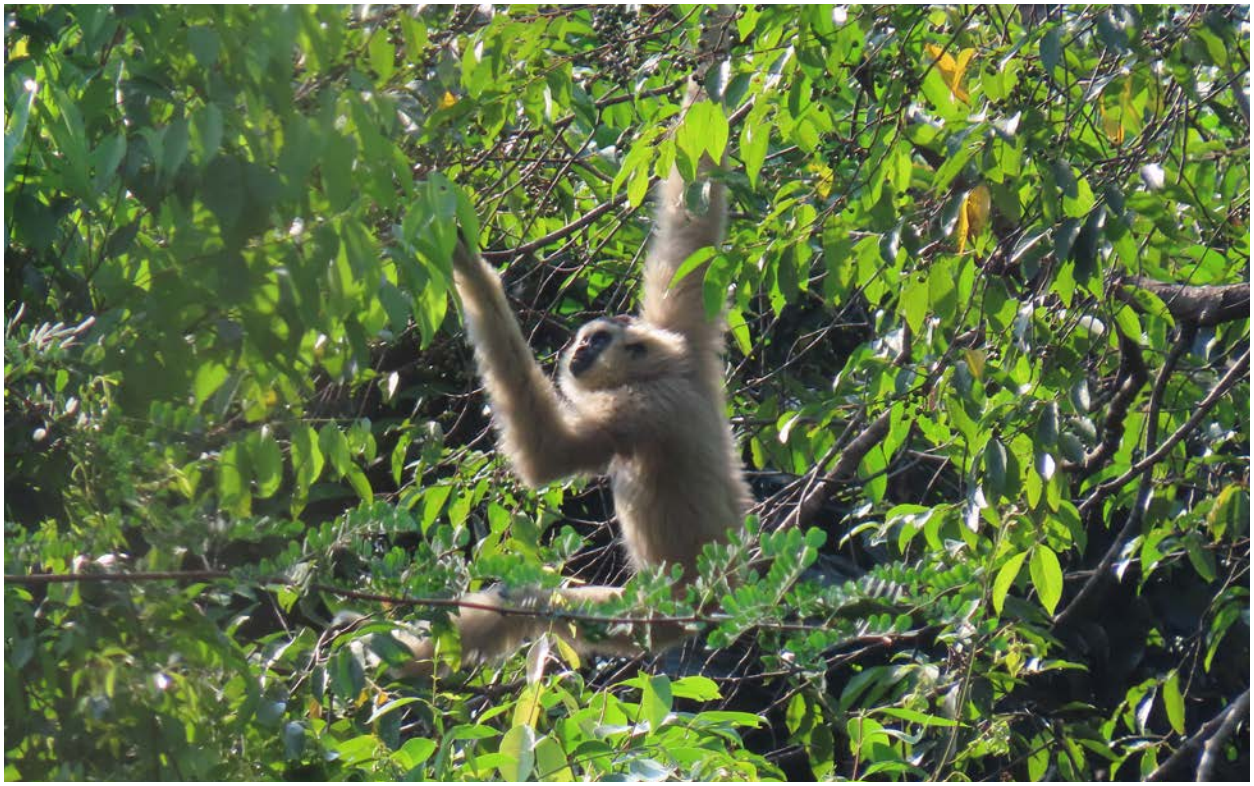
2 Traeholt, C., Bunthoeun, R., Rawson, B., Samouth, M., Virak, C., & Vuthin, S. (2005). Status review of pileated gibbon, *Hylobates pileatus* and yellow-cheeked crested gibbon, *Nomascus gabriellae*, in Cambodia. Fauna & Flora International Cambodia Programme Office, Phnom Penh.

3 IUCN (International Union for Conservation of Nature) 2020. *Hylobates pileatus*. The IUCN Red List of Threatened Species. Version 2025-1.

> Ensuring the survival of pileated gibbons requires strong protection and management of the forest landscapes where they live, particularly in Cambodia.

Pileated gibbons depend on intact forests.[4] As arboreal species, gibbons cannot easily cross open ground, so even relatively narrow gaps in forest cover can prevent their movement.[5] If gibbons must cover open ground, they walk on two feet, holding their arms overhead to help them balance. More often, however, a stretch of open ground functions as a barrier. A road or clear cut—a logged area where all trees have been felled—can restrict them more effectively than any wall. As a result, habitat loss and fragmentation can separate gibbons into smaller subpopulations, which are more susceptible to local extirpation.

Ensuring the survival of pileated gibbons requires strong protection and management of the forest landscapes where they live, particularly in Cambodia.



A female pileated gibbon moves through the canopy in Prey Lang Wildlife Sanctuary.

4 Phoonjampa, R., Koenig, A., Brockelman, W. Y., Borries, C., Gale, G. A., Carroll, J. P., & Savini, T. (2011). Pileated Gibbon Density in Relation to Habitat Characteristics and Post-logging Forest Recovery. Biotropica, 43(5), 619–627.

5 Asensio, N., Kachanan, J., Saralamba, C., & José-Domínguez, J. M. (2021). The impact of roads on the movement of arboreal fauna in protected areas: The case of lar and pileated gibbons in Khao Yai National Park, Thailand. Journal of Tropical Ecology, 37(6), 276–285.

Prey Lang Forest Landscape: A Pileated Gibbon Stronghold

In northcentral Cambodia, the Prey Lang forest landscape is one of the largest remaining lowland evergreen forests in the Indo-Burma biodiversity hotspot.[6] Stretching across more than 5,000 square kilometers (about 1.2 million acres), Prey Lang encompasses eight different forest habitats that are home to a rich array of wildlife, including at least 55 wildlife and 13 plant species threatened with extinction.[7] These include at least 18 threatened mammal species, such as Asian elephants, sun bears, and perhaps one-third of Cambodia's pileated gibbons.

Prey Lang is also the ancestral home of the Indigenous Kuy people. Today, an estimated 250,000 Indigenous Kuy community members still live in the area, and many rely on collecting non-timber forest products—such as resin, honey, rattan, and mushrooms—as a key livelihood. The forest also holds deep cultural and spiritual significance for many Indigenous Kuy and other forest-dependent communities in Prey Lang.[8]

Recognizing the importance of the Prey Lang forest landscape, Cambodia's Ministry of Environment designated it as a wildlife sanctuary in 2016 and expanded it to approximately 4,900 square kilometers in 2023 (Map 2).[9] Despite strong commitments to its protection, illegal logging in Prey Lang continues, placing considerable pressures on gibbons and other at-risk wildlife. Degradation of the forest is also a major concern for the local communities who depend on non-timber forest products for their livelihoods.

Map 2: Prey Lang Wildlife Sanctuary, Cambodia

6 Olsson, A. and D.E. Emmett, eds. (2007). A Floral and Faunal Biodiversity Assessment of Prey Long. Conservation International, Forest & Landscape, University of Copenhagen and Forestry Administration. Phnom Penh, Cambodia.

7 Hayes, B., Eang Hourt, K., Neang, T., Furey, N., Chhin, S., Holden, J., Hun, S., Phen, S., La, P., & Simpson, V. (2015). Biodiversity assessment of Prey Lang: Kratie, Kampong Thom, Stung Treng and Preah Vihear Provinces. Conservation International, Winrock International, USAID.

8 Turreira-García, N., Argyriou, D., Phourin, C., Srisanga, P., & Theilade, I. (2017). Ethnobotanical knowledge of the Kuy and Khmer people in Prey Lang, Cambodia. Cambodian Journal of Natural History, 2017(1), 76–101.

9 Ministry of Environment (2016). Sub-decree No. 74 on the establishment of Prey Lang Wildlife Sanctuary; Ministry of Environment (2023). Sub-decree No. 181 on the expansion of Prey Lang Wildlife Sanctuary.

Project Need: Closing the Knowledge Gap

Prey Lang's gibbon population had gone unsurveyed since the fieldwork in 2002–2003 that was published in 2005.[10] Meanwhile, the landscape has experienced extensive forest loss and degradation. In particular, its lowland evergreen forest has been targeted for high-value timber.[11] Because pileated gibbons depend on intact evergreen forests, there were concerns about significant population losses in the landscape.

Since 2017, Wild Earth Allies has implemented a continuous biomonitoring program in Prey Lang Wildlife Sanctuary, using field surveys and camera traps to assess the status of wildlife species and inform protection. Throughout these years of fieldwork, gibbons stayed mostly out of sight, but our team regularly heard their distinctive calls. Similarly, Indigenous Kuy community members working with our team regularly observed gibbons throughout the forest. Based on what we were learning together, in 2021 we designed and launched a research and conservation project for pileated gibbons. This data is providing an accurate picture of gibbon numbers and habitat needs to fuel effective protection and management in Prey Lang Wildlife Sanctuary.

> This data is providing an accurate picture of gibbon numbers and habitat needs to fuel effective protection and management in Prey Lang Wildlife Sanctuary.

Our initial surveys focused on the sanctuary's core habitat area of evergreen forest, located in Stung Treng province. This survey area, covering 729 square kilometers, represents less than one-quarter of the sanctuary's total area. Stung Treng is one of four provinces that intersect the sanctuary, bordering Kratie to the south, Kampong Thom to the west, and Preah Vihear to the northwest.

In this report, we provide an updated population estimate for pileated gibbons in the core Stung Treng area of Prey Lang Wildlife Sanctuary and offer recommendations for next steps, including expanding surveys and co-creating pileated gibbon conservation strategies with government and community partners. We also report the results of gibbon diet surveys and share how this information is guiding community-based habitat restoration efforts.

10 Traeholt, C., Bunthoeun, R., Rawson, B., Samouth, M., Virak, C., & Vuthin, S. (2005). Status review of pileated gibbon, Hylobates pileatus and yellow-cheeked crested gibbon, Nomascus gabriellae, in Cambodia. Fauna & Flora International Cambodia Programme Office, Phnom Penh.

11 Hayes, B., Eang Hourt, K., Neang, T., Furey, N., Chhin, S., Holden, J., Hun, S., Phen, S., La, P., & Simpson, V. (2015). Biodiversity assessment of Prey Lang: Kratie, Kampong Thom, Stung Treng and Preah Vihear Provinces. Conservation International, Winrock International, USAID.

Project Design

Our Partners and Approach

Wild Earth Allies forms deep relationships with local partners in vital high-biodiversity areas to drive lasting change for people and nature. Together, we design conservation strategies rooted in the unique values, knowledge, and practices of each place. We believe these local actions are key to turning the tide of biodiversity loss globally.

This project is led by our Conservation Manager, Neang Thy. Thy leads our overall biomonitoring program in Prey Lang and has dedicated more than 20 years to wildlife research and conservation across Cambodia's forested landscapes. For this project, he brought together Wild Earth Allies field staff, Indigenous Kuy community members, and protected area rangers to form a collaborative gibbon survey team. Each group contributed complementary skills that greatly strengthened the research effort:

- **Wild Earth Allies team:** Led by Neang Thy, our team also included Field Research Officers Samorn Vireak and Song Det and Community and SMART Coordinator E En. Each team member has a wealth of knowledge in conservation and biological research.

- **Indigenous Kuy community:** As long-time stewards of Prey Lang, Indigenous Kuy community members have deep knowledge of the forest and are committed to its protection. Their experience navigating the dense forest terrain and tracking gibbon calls was essential to the project's success.

- **The Ministry of Environment:** Our work in Prey Lang is only possible with the support of Cambodia's Ministry of Environment, which manages the country's protected areas. For this project, rangers from the Stung Treng provincial Department of Environment played a key role on our gibbon survey team.

Left: *This project was led by Neang Thy, Wild Earth Allies' Cambodia Conservation Manager and lead biologist.*
Right: *A ranger from the Stung Treng Department of Environment and an Indigenous Kuy team member collect data.*

Methodology: Population Assessment

When planning the population assessment, our team first conducted reconnaissance surveys to locate gibbons and their habitats. They found gibbons in evergreen, semi-evergreen, and mixed deciduous forest habitats, but not in habitats lacking year-round leaf cover, such as dry deciduous forests and grasslands. They also noticed gibbons throughout forest areas dominated by dipterocarp trees from which Indigenous Kuy people collect resin using traditional methods. Interviews with resin tappers confirmed this observation, who shared they often hear the distinct calls of gibbons as they collect resin. The Stung Treng area of Prey Lang Wildlife Sanctuary is an ecologically rich zone dominated by evergreen and semi-evergreen forests—and a key area where community members collect resin. For these reasons, our team selected this priority area for the gibbon population assessment.

Gibbons live high in the dense forest canopy, making them difficult to observe directly. Instead, researchers often rely on auditory sampling using a fixed-point triangulation approach. Following this method, we randomly generated 24 sampling points across evergreen and semi-evergreen habitats in our survey area (Map 3). Each sampling point formed a triangle, with its three points spaced one kilometer apart. These became listening points where teams quietly recorded the early morning duets of male-female gibbon pairs. Because gibbons have unique songs, researchers can identify calling gibbons by sound alone.[12] These distinctive songs made it possible to estimate the number of gibbons living within the sampling point.

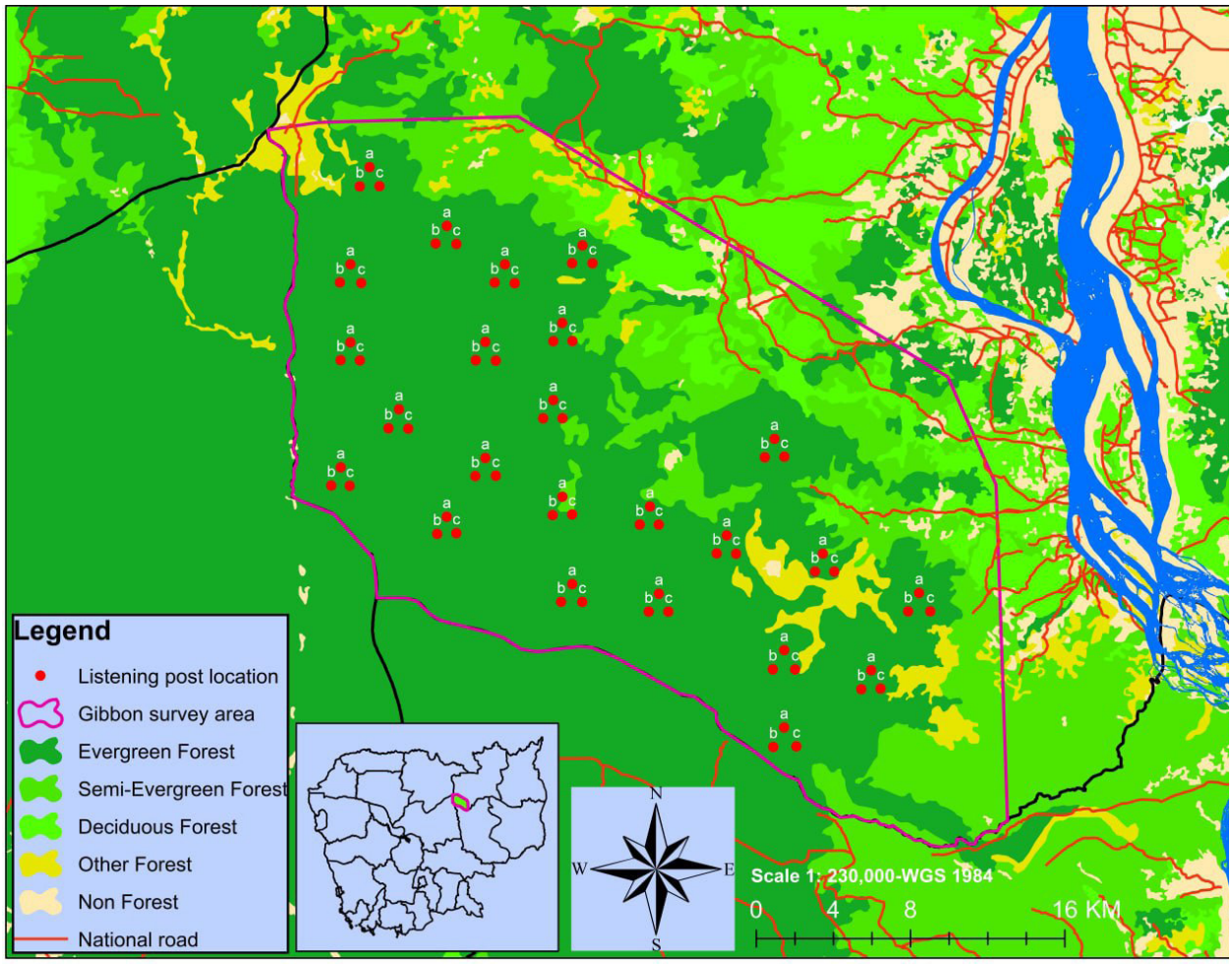
A female pileated gibbon hangs from a branch in Prey Lang Wildlife Sanctuary.

12 Traeholt, C., Bonthoeun, R., Virak, C., Samuth, M., & Vutthin, S. (2006). Song Activity of the Pileated Gibbon, *Hylobates pileatus*, in Cambodia. Primate Conservation, 21, 139–144.

The team surveyed all 24 sampling points over a four-month period in 2022. At each sampling point, they split into pairs and used GPS to navigate to their assigned listening post. There, they listened quietly from 6 a.m. to 12 p.m. and recorded the time, duration, and direction of gibbon songs. One team member per post would also carefully approach gibbon groups to record their location more precisely. This method improved the quality of data collection and allowed them to count the number of gibbons in each group they observed. After each survey day, teams from the three listening posts would then reunite and cross-reference their data to map where each gibbon group lived within the sampling point. They repeated this process for three consecutive days to ensure all gibbon groups were counted.

The density of gibbon groups at each sampling point was calculated by dividing the number of recorded groups by the area of the sampling point. These densities were then extrapolated across the broader 729 square kilometer survey area by multiplying the average group density by the extent of suitable forest habitat. Using an average group size of 3.2 gibbons—based on direct observations of 215 individuals across 67 groups—we estimated the total gibbon population within the survey area.

Map 3: Sampling points for pileated gibbon surveys



Methodology: Diet and Habitat Surveys

Gibbons depend on healthy forest ecosystems—and in turn, gibbons help shape forests as one of the most important seed dispersers in their forest habitats.[13] Pileated gibbons are known to eat fruits and figs, along with some leaves, flowers, and insects.[14] However, little is known about the specific plants they prefer. Our team realized that identifying plants essential to pileated gibbon diet could guide forest management and conservation strategies in Prey Lang, such as prioritizing patrols in key habitats and restoring degraded areas with their preferred foods.

Over four field seasons (2022–2025), our team observed gibbons each morning at selected sites, quietly tracking their movements through the canopy. Using binoculars and long-range cameras, they documented gibbon feeding behavior and collected plant specimens to identify the species and plant parts consumed, such as fruits, leaves, and flowers. To understand the prevalence of these food sources in the forest, we also characterized the forest structure by recording the density, size, and types of plants in three 100-square-meter plots. This research offered valuable insights into the availability and distribution of gibbon-preferred foods in evergreen and semi-evergreen habitats within our survey area.

> Gibbons depend on healthy forest ecosystems—and in turn, gibbons help shape forests as one of the most important seed dispersers in their forest habitats.

Intact seeds from the fruit of Madhuca butyrospermoides were among those found during the study.

13 McConkey, K. R. (2018). Seed Dispersal by Primates in Asian Habitats: From Species, to Communities, to Conservation. International Journal of Primatology, 39(3), 466–492.

14 Srikosamatara, S. (1984). Ecology of Pileated Gibbons in South-East Thailand. In The Lesser Apes: Evolutionary and Behavioural Biology (Eds, Preuschoft, H., Chivers, D. J., Brockelman, W.Y. and Creel, N.). Edinburgh University Press, Edinburgh, pp. 242-257.

Results and Discussion

Population Assessment

In what now represents the most comprehensive survey of pileated gibbons in Prey Lang Wildlife Sanctuary to date, our team documented 2.5 gibbon groups per square kilometer on average and an estimated 5,900 gibbons in our study area. Our survey area, covering 729 square kilometers, represented less than one-quarter of the sanctuary's total size.

These findings point to a larger population and a higher density of gibbons than previously documented in Prey Lang. The last published survey, in 2005, estimated one gibbon group per square kilometer and 10,000 gibbons across a 5,000-square-kilometer landscape that now includes the Prey Lang, Beng Per, and Kulen Promtep Wildlife Sanctuaries.[15] In comparison, our study—covering just 15% of that area—estimated 5,900 gibbons. This difference may reflect the location and quality of forests surveyed. The 2005 publication focused on rapid assessments in economic forest concessions prior to the creation of Prey Lang Wildlife Sanctuary in 2016. In contrast, our team surveyed the sanctuary's core habitat area where evergreen forest remains most intact. The scale of study was also greater in both the survey area and sample size.

> These findings point to a larger population and a higher density of gibbons than previously documented in Prey Lang.

Another key difference between our assessment and the 2005 survey is how group sizes were estimated. Our team directly counted the number of gibbons in each group they were able to see, resulting in 215 gibbons recorded across 67 groups. The 2005 survey relied only on gibbon vocalizations and assumed each group consisted of the male-female mating pair, excluding any non-calling juveniles or subadults that may have been present. Because of this methodology, the survey authors underscored that their estimated gibbon density may be lower than the actual density, as non-calling individuals were not included.

In our survey, gibbon group sizes ranged from two to six individuals, averaging about three per group. This result aligns with research in Thailand where pileated gibbon groups also included between two and six individuals.[16] Pileated gibbons typically reproduce every two to four years, with offspring maturing around six to seven years of age. This life cycle means groups often include one to three offspring of different ages. When young adults are ready to leave the parental group, they usually establish a new territory nearby, meaning pileated gibbon populations expand across landscapes

15 Traeholt, C., Bunthoeun, R., Rawson, B., Samouth, M., Virak, C., & Vuthin, S. (2005). Status review of pileated gibbon, *Hylobates pileatus* and yellow-cheeked crested gibbon, *Nomascus gabriellae*, in Cambodia. Fauna & Flora International Cambodia Programme Office, Phnom Penh.

16 Phoonjampa, R., & Brockelman, W. Y. (2008). Survey of pileated gibbon *Hylobates pileatus* in Thailand: Populations threatened by hunting and habitat degradation. Oryx, 42(04), 600.

Based on these early findings, we estimate at least 12,000 pileated gibbons in the sanctuary, further underscoring the critical importance of this forest landscape for the species.

very slowly.[17] Larger groups may form when mature offspring delay leaving their parental groups, usually when potential mates or high-quality forest habitat are scarce.[18] Therefore, the average of three gibbons per group observed in our survey area may suggest there is still space for new groups to establish territories.

As a next step, our team is surveying additional evergreen forest areas across the broader Prey Lang Wildlife Sanctury. We recently conducted surveys in Kampong Thom, Kratie, and Preah Vihear provinces, where additional large tracts of evergreen forest remain. Preliminary results show that gibbon numbers are consistent across these habitats. Based on these early findings, we estimate at least 12,000 pileated gibbons in the sanctuary, further underscoring the critical importance of this forest landscape for the species.

Pileated Gibbon Diet and Habitat Surveys

Pileated Gibbon Diet

Between 2022–2025, we documented pileated gibbons feeding on 62 plant species representing 29 families (See Annex). The Annonaceae family was the most represented family with seven species, followed by Clusiaceae, Moraceae, and Myrtaceae, each with four species. The taxonomy of two plants is still unidentified, though they are known by common name in the Khmer language.

Gibbons fed on a variety of plant parts—fruits, leaves, and flowers—from 49 tree and 13 liana species. Lianas are woody vines that climb from the forest floor into the canopy that often form dense, hanging networks that gibbons use as pathways. Gibbons strongly preferred fruits, eating fruits from 52 of the 62 plant species. Of these, gibbons swallowed and dispersed intact seeds from 16 fruit-bearing species. Gibbons also consumed leaves from 22 species and flowers from nine species.

The 62 plant species recorded in this study likely reflect only a portion of pileated gibbon diet in Prey Lang. We expect the diversity of gibbon diet to increase with more investigation, in part due to varying food availability across seasons. The availability of gibbon plant foods may also differ between habitat types and locations across the wildlife sanctuary.

17 Traeholt, C., Bunthoeun, R., Rawson, B., Samouth, M., Virak, C., & Vuthin, S. (2005). Status review of pileated gibbon, *Hylobates pileatus* and yellow-cheeked crested gibbon, *Nomascus gabriellae*, in Cambodia. Fauna & Flora International Cambodia Programme Office, Phnom Penh.

18 Brockelman, W. Y., Reichard, U., Treesucon, U., & Raemaekers, J. J. (1998). Dispersal, pair formation and social structure in gibbons (Hylobates lar). Behavioral Ecology and Sociobiology, 42(5), 329–339.

> Our habitat surveys revealed both evergreen and semi-evergreen forest habitats are dominated by tall trees with large branches.

Habitat Survey

Our habitat surveys revealed both evergreen and semi-evergreen forest habitats are dominated by tall trees with large branches, such as *Dipterocarpus costatus* and *Anisoptera costata*—dipterocarp species typical of lowland tropical forests. Their lower canopies were dense with tangled lianas, and the understory was rich with smaller plants and seedlings, some likely dispersed by gibbons. To explore this possibility, we collected intact seeds from gibbon dung and planted them in tree nurseries. Several species, such as *Grewia eriocarpa*, successfully germinated, confirming that pileated gibbons help disperse these plant species.

A young gibbon climbs a liana, or woody vine, hanging from the thick branches of an Anisoptera costata tree. This type of dipterocarp tree dominates the evergreen and semi-evergreen habitats of Prey Lang Wildlife Sanctuary and serves as a vital gibbon food source. During our diet surveys, gibbons ate fruits, leaves, and flowers from this endangered tree species.

Community Use of Gibbon Dietary Plants

Over 80% of plants identified as gibbon foods are also valued by Indigenous Kuy and other forest-dependent communities for food, medicine, and materials (See Annex). For instance, we found that 34 plant species serve as food sources and 28 are valued for their medicinal properties. Community members also collect materials from 24 species, such as timber or fiber, for use in home construction and other household goods. Eight species are used as fuel sources, such as for charcoal production or firewood (Figure 1).

Two important dipterocarps—*D. alatus* and *D. costatus*—are valued for their resin, which provides a major source of household income and is commonly used as a boat sealant.[19] As revealed in our habitat surveys, dipterocarp trees also dominate the evergreen and semi-evergreen forest habitats that gibbons rely on. Unfortunately, all three dipterocarp trees documented as gibbon foods in this study are globally threatened, according to the IUCN.[20]

Community Uses of Gibbon Plant Foods

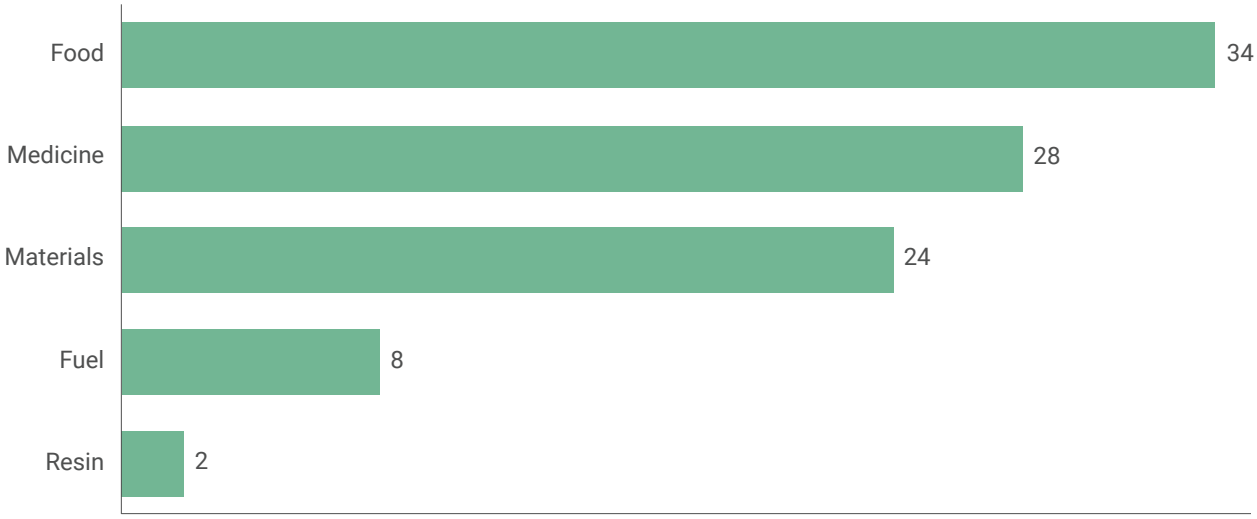


Figure 1. *The number of gibbon dietary plant species valued by local communities for food, medicine, materials, fuel, and resin.*

19 Turreira-García, N., Argyriou, D., Phourin, C., Srisanga, P., & Theilade, I. (2017). Ethnobotanical knowledge of the Kuy and Khmer people in Prey Lang, Cambodia. Cambodian Journal of Natural History, 2017(1), 76–101.

20 Ly, V., Nanthavong, K., Pooma, R., Luu, H.T., Nguyen, H.N., Barstow, M., Vu, V.D., Hoang, V.S., Khou, E. & Newman, M.F. (2017). *Dipterocarpus costatus*. The IUCN Red List of Threatened Species 2017: e.T33010A2830217; Ly, V., Nanthavong, K., Pooma, R., Barstow, M., Luu, H.T., Khou, E. & Newman, M.F. (2023). *Dipterocarpus alatus* (amended version of 2017 assessment). The IUCN Red List of Threatened Species 2023: e.T33007A231194805; Nguyen, H.N., Vu, V.D., Luu, H.T., Hoang, V.S., Pooma, R., Khou, E., Nanthavong, K., Newman, M.F., Ly, V. & Barstow, M. 2017. *Anisoptera costata*. The IUCN Red List of Threatened Species 2017: e.T33166A2833752.

Conservation Implications

Forest degradation is the primary risk facing pileated gibbons in Prey Lang Wildlife Sanctuary. Although Prey Lang was designated a wildlife sanctuary in 2016, illegal logging continues—especially targeting high-value timber like dipterocarps.[21] Cutting down large, old-growth trees fragments the forest and opens gaps in the canopy. These gaps can limit gibbon movement and reduce access to their preferred foods.

While this study focused on Prey Lang's core habitat area, our team found gibbon groups in lower-quality habitats around the sanctuary's edges, such as cashew plantations and small forest patches along streams. As highly territorial animals, gibbons are reluctant to leave their home range—even when the surrounding forest is disturbed. Given this behavior, the gibbon groups we observed in these marginal habitats may have become stranded as the forest around them was cleared.

Looking ahead, further research is needed to better understand where gibbons live across the broader Prey Lang Wildlife Sanctuary and whether they face challenges related to limited food or space. Mapping high-quality habitat and areas where their preferred food sources are abundant will guide targeted protection of these priority areas. Given ongoing deforestation, habitat restoration will also be essential.

A male pileated gibbon sits in a tree in Prey Lang Wildlife Sanctuary.

21 Hayes, B., Eang Hourt, K., Neang, T., Furey, N., Chhin, S., Holden, J., Hun, S., Phen, S., La, P., & Simpson, V. (2015). Biodiversity assessment of Prey Lang: Kratie, Kampong Thom, Stung Treng and Preah Vihear Provinces. Conservation International, Winrock International, USAID.

Looking Ahead

As we look to the next steps of this project, one message is clear: Prey Lang is a global stronghold for pileated gibbons. Our collaborative work also underscores the urgent need to protect both the species and its habitat in ways that integrate local knowledge, values, and practices. Together with government and community partners, we are now advancing the following key strategies, shaped by what we have learned together so far:

Increase our knowledge: There is still much to learn to effectively protect gibbons and their habitat. We are expanding surveys across the entire Prey Lang Wildlife Sanctuary to refine the overall population estimate. Our continued diet study will help us better understand which plant species are most important for gibbons and where they are available in the forest. Together, this information will help us identify priority gibbon sites for long-term monitoring and protection—as well as degraded areas to prioritize for habitat restoration.

> As we look to the next steps of this project, one message is clear: Prey Lang is a global stronghold for pileated gibbons.

Protect and restore gibbon habitat: Pileated gibbons depend on healthy forest ecosystems, yet Prey Lang continues to face habitat fragmentation. In response, we launched a restoration program focused on threatened trees and plants essential to at-risk wildlife. Together with Indigenous Kuy partners, we have established two community-managed tree nurseries, each with the capacity for growing 20,000 seedlings. These nurseries cultivate Gibbon Trees, or gibbon plant foods, to restore degraded areas and enrich gibbon food sources.

Support local livelihoods: Community-managed tree nurseries will also increase local access to valued natural resources. Meanwhile, our team is collaborating with Kuy community members to establish non-timber forest product restoration groups to improve the management and protection of Prey Lang's trees, including resin-producing dipterocarps. Together, we are also exploring the potential for developing community-based gibbon ecotourism to grow sustainable livelihood options and generate funding for local conservation programs.

Strengthen protected area management: Together with the Ministry of Environment and community partners, we are developing a long-term monitoring plan to strengthen forest management and gibbon conservation in Prey Lang Wildlife Sanctuary. We will update the sanctuary's management plan to integrate gibbon conservation strategies, such as prioritizing key habitats for patrols. Together, we will establish monitoring protocols to track gibbon numbers, their range, and changes in group size over time.

> Our findings spark optimism about the future of pileated gibbons. With sustained investment in key strategies and deep collaboration with partners, pileated gibbons and local communities can thrive in a healthy Prey Lang forest landscape.

Share information: Together with partners, we are sharing what we are learning about pileated gibbons in Cambodia and globally. Once ongoing surveys are complete, we will publish our collective findings. In Prey Lang, we are engaging local schools and communities in conservation learning focused on pileated gibbons and their important role in forest ecosystems. We also plan to launch communications campaigns to raise public awareness of Cambodia's vital role in the species' global survival.

Our findings spark optimism about the future of pileated gibbons. With sustained investment in key strategies and deep collaboration with partners, pileated gibbons and local communities can thrive in a healthy Prey Lang forest landscape.

Join us

Explore and share the story map
Experience key takeaways and visuals brought to life in our interactive story map, Pileated Gibbons of Prey Lang: Insights from a Global Refuge.

Support our work
Make a gift to advance the next phase of community-based pileated gibbon research and forest protection in Prey Lang.

Acknowledgments

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Annex: Plants Consumed by Pileated Gibbons

Plant species eaten by pileated gibbons in Prey Lang Wildlife Sanctuary, Cambodia.[22] Community uses are listed for plant species with known local value.[23]

No.	Scientific name	Family	Community use
1	*Buchanania cochinchinensis* (Lour.) Almeida	Anacardiaceae	Food, medicine
2	*Mangifera cochinchinensis* Engl.	Anacardiaceae	Food, materials
3	*Artabotrys hexapetalus* (L.f.) Bhandari	Annonaceae	Medicine
4	*Artabotrys* sp. 1	Annonaceae	
5	*Melodorum fruticosum* Lour.	Annonaceae	Food, fuel, materials, medicine
6	*Mitrephora tomentosa* Hook. F. & Thomson	Annonaceae	
7	*Uvaria hahnii* (Finet & Gagnep.) J. Sinclair	Annonaceae	Food, medicine
8	*Uvaria littoralis* (Blume) Blume	Annonaceae	Food, medicine
9	*Uvaria micrantha* (A.DC.) Hook.f. & Thomson	Annonaceae	Medicine
10	*Streptocaulon juventas* (Lour.) Merr.	Apocynaceae	Medicine
11	*Willughbeia edulis* Roxb.	Apocynaceae	Food, medicine
12	*Pothos scandens* L.	Araceae	
13	*Calophyllum tetrapterum* Miq.	Calophyllaceae	Food, materials
14	*Salacia typhina* Pierre	Celastraceae	Food, medicine
15	*Siphonodon celastrineus* Griff.	Celastraceae	Food, materials, medicine
16	*Parinari anamensis* Hance	Chrysobalanaceae	Food, medicine
17	*Garcinia dulcis (Roxb.)* Kurz	Clusiaceae	Food, materials
18	*Garcinia oliveri* Pierre	Clusiaceae	Food, fuel, medicine
19	*Garcinia rigida* Miq.	Clusiaceae	Food
20	*Garcinia* sp. 1	Clusiaceae	
21	*Combretum latifolium* Blume	Combretaceae	Food, medicine
22	*Terminalia chebula* Retz.	Combretaceae	Food, materials, medicine
23	*Anisoptera costata* Korth.	Dipterocarpaceae	Materials
24	*Dipterocarpus alatus* Roxb.	Dipterocarpaceae	Materials, medicine, resin
25	*Dipterocarpus costatus* C.F.Gaertn.	Dipterocarpaceae	Materials, resin
26	*Diospyros* sp. 1	Ebenaceae	Materials
27	*Croton joufra* Roxb.	Euphorbiaceae	Medicine
28	*Dalbergia pinnata* (Lour.) Prain	Fabaceae	Food, materials
29	*Dialium cochinchinense* Pierre	Fabaceae	Materials

22 Accepted names and synonymy of plant species follow the GBIF – Global Biodiversity Information Facility (https://www.gbif.org).

23 Community uses of plant species documented in interviews conducted by our team; Dy Phon, P. (2000). Plants Used in Cambodia. Imprimerie Olympic, Phnom Penh; Turreira-García, N., Argyriou, D., Phourin, C., Srisanga, P., & Theilade, I. (2017). Ethnobotanical knowledge of the Kuy and Khmer people in Prey Lang, Cambodia. Cambodian Journal of Natural History, 2017(1), 76–101.

Annex (Continued)

No.	Scientific name	Family	Community use
30	*Sindora siamensis* Teijsm. ex Miq.	Fabaceae	Food, materials, medicine
31	*Gnetum macrostachyum* Hook.f.	Gnetaceae	
32	*Gnetum montanum* Markgr.	Gnetaceae	Food, materials
33	*Irvingia malayana Oliv.* ex A.W.Benn.	Irvingiaceae	Food, fuel, materials, medicine
34	*Vitex pinnata* L.	Lamiaceae	Medicine
35	*Beilschmiedia penangiana* Gamble	Lauraceae	
36	*Grewia eriocarpa* Juss.	Malvaceae	Food, materials
37	*Heritiera javanica* (Blume) Kosterm	Malvaceae	Materials
38	*Microcos tomentosa* Sm.	Malvaceae	Food, fuel, materials
39	*Sandoricum koetjape* (Burm.fil.) Merr.	Meliaceae	Food, materials, medicine
40	*Ficus altissima* Blume	Moraceae	Medicine
41	*Ficus benjamina* L.	Moraceae	Medicine
42	*Ficus racemosa* L.	Moraceae	Food, medicine
43	*Ficus religiosa* L.	Moraceae	
44	*Myristica iners* Blume	Myristicaceae	Food, materials
45	*Syzygium cumini* (L.) Skeels	Myrtaceae	Food, fuel, medicine
46	*Syzygium grande* (Wight) N.P.Balakr.	Myrtaceae	Food, medicine
47	*Syzygium oblatum* (Roxb.) Wall. ex A.M.Cowan & Cowan	Myrtaceae	Medicine
48	*Syzygium* sp. 1	Myrtaceae	Food
49	*Bridelia ovata* Decne.	Phyllanthaceae	Food
50	*Xanthophyllum colubrinum* Gagnep.	Polygalaceae	Food, materials
51	*Xanthophyllum flavescens* Roxb.	Polygalaceae	
52	*Clematis horripilata* D.Falck & Lehtonen	Ranunculaceae	
53	*Psydrax pergracilis* (Bourd.) Ridsdale	Rubiaceae	Materials
54	*Acronychia pedunculata* (L.) Miq.	Rutaceae	Medicine
55	*Dimocarpus longan* Lour.	Sapindaceae	Food, fuel, medicine
56	*Nephelium hypoleucum* Kurz	Sapindaceae	Food, materials
57	*Xerospermum noronhianum* (Blume) Blume	Sapindaceae	Food, fuel
58	*Donella lanceolata* (Blume) Aubrèv	Sapotaceae	
59	*Madhuca butyrospermoides* A.Chev	Sapotaceae	Food, fuel, materials
60	*Madhuca cochinchinensis* (Pierre ex Dubard) H.J.Lam	Sapotaceae	Food
61	unknown sp. 1	unknown	
62	unknown sp. 2	unknown	