

Applying culturomics to understand the motives behind the surrender of pet gibbons: Evidence from Indonesia

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Abstract. *Abdi AM. 2023. Applying culturomics to understand the motives behind the surrender of pet gibbons: Evidence from Indonesia. Biodiversitas 24: 4606-4616.* Seven of nine gibbon (Hylobatidae) species in Indonesia are protected by national regulation with threats to habitat fragmentation and illegal trade. People persist in owning gibbons as pet animals, violating the protected species law. To date, numerous pet gibbons have been surrendered to the authorities, which could result from intensified public awareness. More targeted demand reduction campaigns may be possible with a better understanding of the motivations behind these handovers. This study aims to document gibbon surrenders by the public to authorities and the motives behind these actions. Instagram posts and online local news were collated and analyzed between 2016 and 2023, comprising information on gibbon handovers to the authorities. From the 138 posts analyzed, 161 gibbon individuals, including 6 species from Sumatra (47.2%), Kalimantan (29.8%), Java (21.7%), and Bali (1.2%) were surrendered. Since 2016, the annual number of gibbons received by authorities has steadily increased. Handover motives appear to be overwhelmingly based on legal reasons. Although regarded as ineffective in mitigating trade, law enforcement and fear of the law were the primary reasons for gibbon handovers. Therefore, publicizing successful law enforcement cases of gibbon trade in the media could deter future buyers and reduce demand.

Keywords: Conservation culturomics, endangered species, illegal trade, news coverage, primate conservation, social media

INTRODUCTION

The illegal trade of wildlife for pets is increasingly prevalent in Indonesia. In addition to domestic animals, wildlife such as primates, reptiles, and protected wild birds are becoming preferred as pets (Nijman 2009; Chng et al. 2015; Morgan and Chng 2018). Based on previous research in the United States, the media is influential in portraying wildlife not commonly kept as pets to be accompanied at home (Leighty et al. 2015; Cronin et al. 2022). The younger the respondent, the higher the interest in keeping exotic animals. On the other hand, gender plays a significant role in how to keep exotic animals, reptiles such as snakes, but not significantly in keeping mammals such as sloths (Cronin et al. 2022).

Gibbons as non-traditional pets are in high demand in some parts of Indonesia (Abdi et al. 2021; Nijman et al. 2021). The motivation of the community for keeping non-traditional pets varies, for example, for entertainment, social status, companionship, and security against home intruders (Duarte-Quiroga and Estrada 2003; Jones-Engel et al. 2005; Rodríguez et al. 2020). Although gibbons can live longer in captivity for up to 60 years, these owners do not maintain ownership for long periods (Geissmann et al. 2009).

Sherman et al. (2020) defined surrender activity by ex-owners as returning primate pets to the authorities from the communities without formal legal action. The owner eventually surrendered their pet gibbons to the authorities for various reasons (Fleury 2017). The Indonesian Nature Conservation Agency, locally known as *Balai Konservasi*

Sumber Daya Alam (BKSDA), is the official Indonesian agency to receive seized wildlife, carry out persuasive surrenders from owners that the public has reported, or receive them via voluntary donations (PPID 2018). After handing over a gibbon to the authorities, the owner has to sign a commitment letter stating they will never keep other gibbons (pers. obs.). In this case, penalties are rarely given to owners reported by the public, even though they have broken the law by keeping a protected species as a pet. Therefore, surrendering protected species is not legally punishable because the former owners have good intentions to support conservation efforts. Not all BKSDA offices have suitable facilities to rehabilitate or care for all wild animal species, and they may transfer the animal to a non-governmental-owned rehabilitation center or even to a zoo (Ferrie et al. 2014).

In recent decades, conservation science and practice development has expanded into domains beyond conventional conservation science (Kosinski et al. 2015; Sbragaglia et al. 2021; Vardi et al. 2021). Conservation culturomics is the interaction between humans and nature in a digital world that provides new insights into the study of conservation at a scale (Ladle et al. 2016). The research that has been conducted covers constituencies and public interest, identifying conservation emblems, environmental monitoring and valuation, cultural impact assessment, and policy and issue framing (Di Minin et al. 2015; Hausmann et al. 2018). The data source in this field comes from user-generated content such as news portals, social networking websites, online encyclopedias, web pages, and so forth (Correia et al. 2021). In more specific examples,

researchers can assess public sentiment toward visiting a national park, study poaching from court cases or characterize illegal online trade (Burivalova et al. 2017; Margulies et al. 2019; Masters et al. 2022).

However, as public data, information on gibbons submitted to the BKSDA is not comprehensively published. Furthermore, this information is unavailable to the general public, although Indonesia has founded and committed to the Open Government Partnership (Open Government Partnership 2019). This study aims to document pet gibbons surrendered by the public and investigate the motives behind these actions to the authorities.

(Figure 1). The researcher began by defining the research scope within the research and dimension. In this study, posts were selected as dimensions, considering the aim of the research and research questions. Seizures of gibbons sourced from the illegal trade where the keepers are prosecuted are excluded in this study.

This research was carried out by adapting the conservation culturomics approach (See Research procedure below), where the available data on the internet is utilised as a source (Ladle et al. 2016; Correia et al. 2021). This approach allows the researchers to acquire various forms of data from the internet as long as the data are available and open access. For instance, the legal cases to perceive the modus operandi of wildlife hunting, understanding consumer trends on illegal wildlife trade, and the effect of framing the endangered species to viewer’s perspective on video sharing platform (Sung and Fong 2018; Ballejo et al. 2021; Wong and Lemieux 2021).

MATERIALS AND METHODS

Research procedure

Defining research scope

In conducting conservation culturomics-related research, some main stages must be met to obtain data

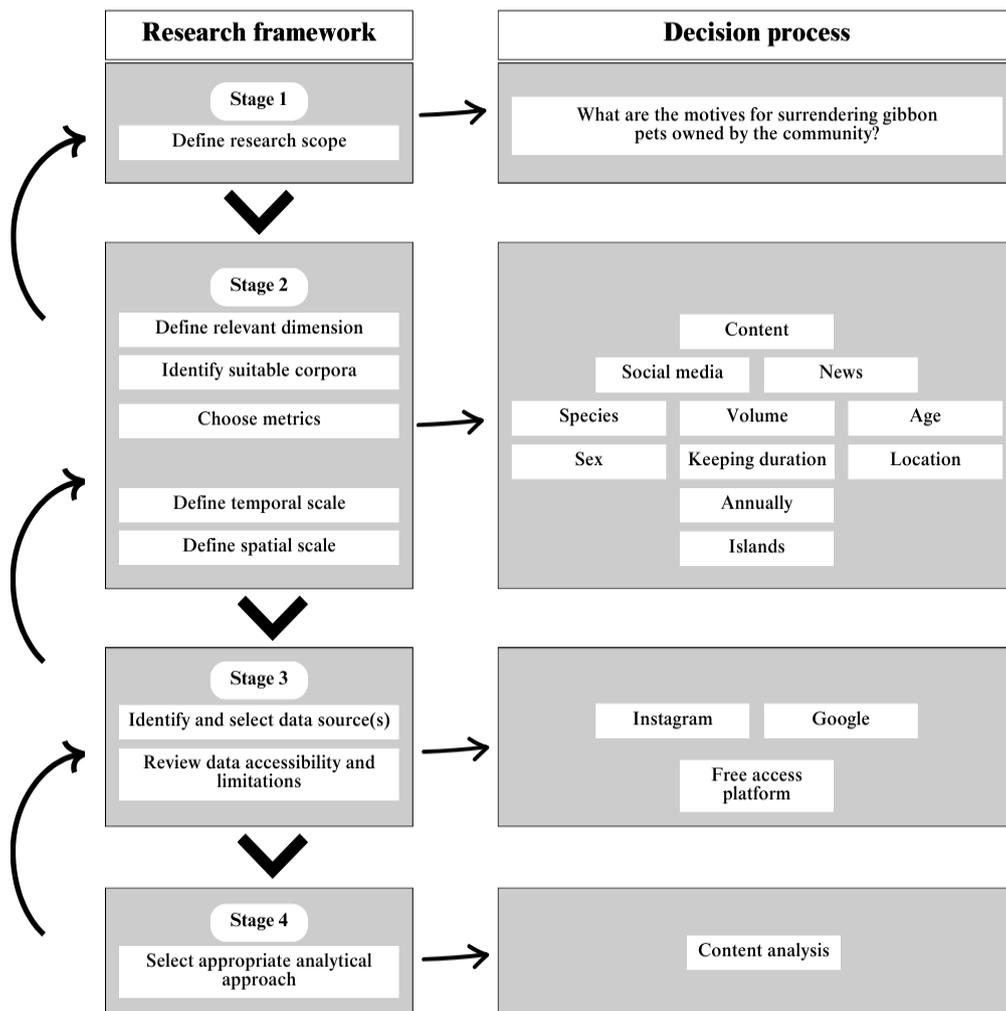


Figure 1. Research procedure in conservation culturomics, adapted from Correia et al. (2021). Note that culturomics research is a process that is typically characterized by a high degree of iteration (see arrow directions in the figure)

Selecting relevant corpora for analysis

Instagram was chosen because it is a free access site that provides abundant digital data, including text, images, and videos. Therefore, the researcher extracted some information about the surrender events such as species, volume, sex, age, date, keeping duration, and location. During the initial period of this study, social media accounts visited daily from March to September 2022 limited to the occurrence of gibbon habitat in three islands: Sumatra, Kalimantan, and Java. However, in 2021, there were two surrenders of two siamang infants in Bali. Therefore, the researcher included them in the analysis (Table 1). The observation and surveillance of the surrender of gibbons in Bali were *ad libitum* efforts, and it has been noted that the level of vigilance is not as rigorous as that carried out in Sumatra, Kalimantan, and Java.

In addition, social media websites and media coverage articles were selected as the sources of corpora since it is available as a data source. Instead of visiting pre-selected online news portals, this study used keywords related to the surrender of pet gibbons and performed manual and thorough searches in the Google search engine (Table 2).

Identifying possible data sources and data extraction

There were two types of data sources used in this study. Firstly, Instagram posts from official accounts where gibbon species's natural habitat are prevalent and secondly, media coverages related to gibbon-surrendering events. Since some BKSDA's social media accounts have multiple subordinate accounts called *Seksi Konservasi Wilayah* (Section of Area Conservation), the researcher also includes these accounts in the data sources. Instead of BKSDA's official website, Instagram was selected as a data source because of the regularity of the content uploaded compared to the website. Moreover, the author's opinion is not to retrieve the data from BKSDA websites because not all BKSDA have their web pages. One Instagram account started to upload content in 2016; the author excluded this account since it remained inactive for a long time.

Media coverage was used as a complementary data source to comprehensively understand the motive of surrendering gibbons. The Instagram posts may not reflect the actual events; thus, news coverage related to the gibbon surrender is used as other sources to complement the data and cross-check the surrender events. The news monitored in this study ranged from 2017 to 2023. The filters applied were language to set the Indonesian language and the region filter for Indonesia. The data displayed in 2023 represents only the period until the end of June.

In both data sources, gibbon species, volume, sex, age, date, keeping duration, sources, and location of surrender event are recorded as the information usually included within the news. Additionally, the journalists often write authorities' statements regarding the surrender events. If statements from authorities contain information about gibbon (species, volume, sex, age, keeping duration, location, source, or motives), then it is analyzed and treated as data.

Table 1. The number of selected Instagram accounts of BKSDA to search the relevant posts. Although Bali is not considered a natural habitat for gibbons and siamangs, the inclusion of this location in the present study is warranted owing to a surrender incident that happened in 2021

Islands	Number of Instagram accounts
Sumatra	21
Jawa	13
Kalimantan	12
Bali	1
Total	47

Table 2. Keywords applied in Google search engines between 2017 and 2023 (N = 9). In this study, only news in the Indonesian language was included

Keywords in Indonesian	English translation	Species names
<i>Penyerahan; penyitaan</i>	Surrender	-
<i>Owa Jawa</i>	Javan gibbon	<i>Hylobates moloch</i>
<i>Ungko</i>	Agile gibbon	<i>Hylobates agilis</i>
<i>Siamang</i>	Siamang	<i>Symphalangus syndactylus</i>
<i>Owa Kalimantan</i>	Bornean white-bearded gibbon	<i>Hylobates albibarbis</i>
<i>Owa Kalimantan</i>	Müller's gibbon	<i>Hylobates muelleri</i>
<i>Serudung</i>	Lar gibbon	<i>Hylobates lar</i>
<i>Bilou</i>	Kloss's gibbon	<i>Hylobates klossii</i>
<i>Siamang kerdil</i>	Kloss's gibbon	<i>Hylobates klossii</i>

Review data accessibility and limitations

The data presented in this paper is directly from social media posts, thus constituting raw data. Subsequently, this raw data is stored within a cloud-based spreadsheet, undergoing encoding, parsing, and filtration process. The dataset then emerges as basic data for comprehending the patterns and trends in the surrender of pet gibbons to regulatory authorities.

Analytical approach

As a media-sharing platform, most Instagram users will upload visual content such as photographs and videos. Users can also add descriptions in the form of the text of the visual contents in the caption section; after that, content analysis is employed in social media captions and news coverage. In this study, both types of content (visual and textual) will be analyzed and interpreted simultaneously based on the respective event. These combinations provide comprehensive information about certain events (You et al. 2016).

Based on preliminary observation, captions often contain useful data to examine ex-owners motives, such as the origin of gibbons, the reason for owning gibbons, and so forth. In other words, captions may include additional information about the activity, while the visual contents could help the researchers identify gibbon species (Toivonen et al. 2019). Thus, the author is extracting gibbon-related information (Figure 1; Stage 2) and statements from ex-owners and officials that contain

motives to surrender their gibbons. In addition, from the posts included in the analysis, the researcher can extract information regarding the ex-owners motives, the origin of the gibbon, and surrender motives that appeared in the events observed.

Research ethics

Under certain conditions, the study of conservation culturomics allows researchers to collect sensitive data while adhering to user privacy policies (Di Minin et al. 2019; Sbragaglia et al. 2021). However, this study discovered that the authorities' accounts contained information that could expose former keepers' personal information (Monkman et al. 2017; Giovos et al. 2018). Furthermore, keeping protected animals is considered an illegal activity that violates the law, so these data are sensitive. As a result, this study adheres to mitigation strategies proposed by Sbragaglia et al. (2021), such as data minimization and pseudonymity of ex-keepers' identities. This study safeguarded former keepers' personal information as well as the Instagram accounts owned by the authorities by omitting the former keeper's name, full address, and Instagram accounts. Therefore, this paper will not include photo captions (and their alternative texts) to avoid being found by search engines.

RESULTS AND DISCUSSION

In this study, the researcher recorded 138 posts related to surrender events from social networking sites (N = 98) and complemented with media coverage (N = 40). All surrendered events of pet gibbons were in range regions such as Java, Kalimantan, and Sumatra; only one surrender case where two siamang infants were surrendered in Bali.

Pet gibbons surrendered

Moreover, 161 gibbon individuals from 6 different species were handed over to authorities during the monitored period (Figure 2). Siamang (N = 55) appears to be the most surrendered Hylobatid species compared to others, followed by agile gibbons (N = 33). Bornean gibbon species, such as white-bearded gibbons (N = 29) and Müller's gibbons (N = 21), also surrendered. Over the given period, 19 Javan gibbon individuals surrendered to authorities. The surrender of lar gibbons was recorded twice, with 4 individuals relinquished to BKSDA in Aceh and one individual to authorities in North Sumatra. This species only inhabits the Northern part of Sumatra Island and has rarely been recorded previously in illegal trade monitoring (Nijman et al. 2021).

Age and sex of Hylobatid species kept as pet

Of 81 posts provided with information on age, the categorization of age was found to be infant, juvenile, adolescent, and adult (Table 3). The majority of pet gibbons were in the adolescent phase (33.3%), followed by juvenile (32.1%), while the proportions of adults and infants handed over to the authorities were similar (14.8 - 19.8%).

Concerning the sex of the gibbon, amongst the 161 analyzed posts, a greater proportion of the primates surrendered to authorities were male (31.1%), as opposed to female gibbons (23.6%). However, owing to the substantial percentage of gibbons with unidentified sex (45.3%), it is not feasible to assert with certainty that males are habitually kept based on the data provided. Furthermore, due to the limited availability of data pertaining to the sex of gibbons, further discussion on the matter is precluded.

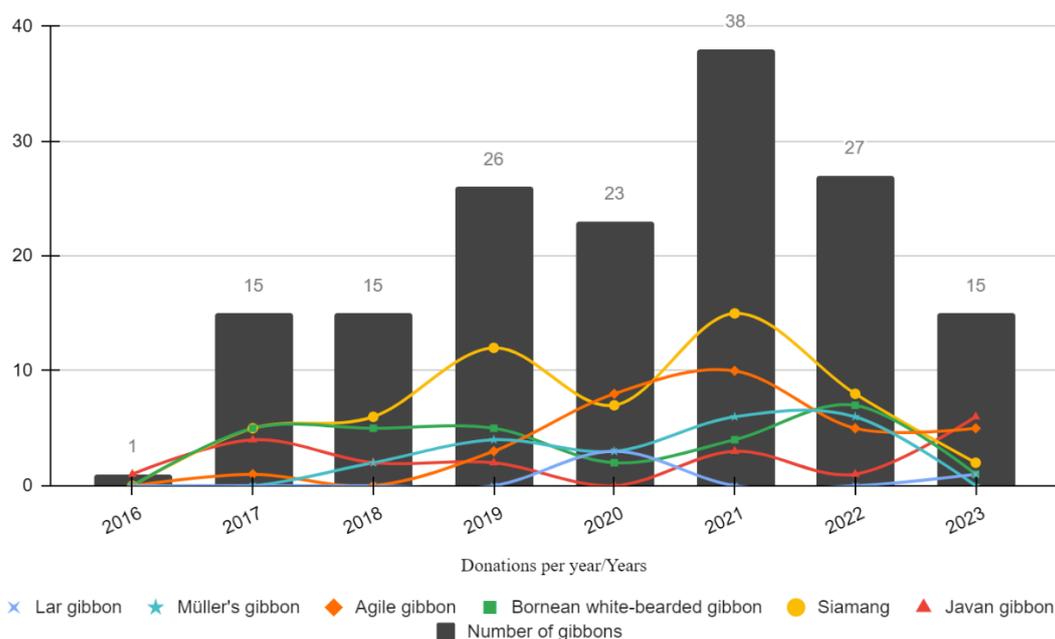


Figure 2. The surrendered pet gibbons to authorities between 2016 and 2023 comprised lar gibbons, Müller's gibbons, agile, white-bearded, siamangs, and Javan gibbons. Note that in 2023, the availability of data is limited to only the month of June

Table 3. Pet gibbons surrendered to officials from 2016 to 2023 (N = 81). This paper follows Brockelman et al. (1998) for the age classification of Hylobatid species

Age range	Category	Number of individuals	Percentage
< 2 years	Infant	16	19.8%
2-5 years	Juvenile	26	32.1%
5-8 years	Adolescent	27	33.3%
> 8 years	Adult	12	14.8%

Spatial patterns of gibbon surrender locations

Pet gibbons were relinquished in 4 different islands (Figure 3). Most of these cases were detected in the Sumatra region (N = 67 cases) from 8 provinces. Specifically, hotspots were identified in two provinces i.e., Aceh and Riau (N = 15 cases). The second largest surrender cases were in Kalimantan (N = 44 cases), with most cases found in Central Kalimantan (N = 30). Meanwhile in Java exhibited 8 surrenders, with the maximum number of cases occurring in the capital city of Jakarta.

Similar to the incidence of gibbon surrender cases, the number of gibbons surrendered in Sumatra was the most pronounced (Figure 4), with 17 pet gibbons surrendered in Riau. In Kalimantan, the number of gibbons surrendered to the authorities amounted to 48, of which 33 were relinquished from Central Kalimantan. Conversely, in Java, the total of surrendered gibbons stood at 35, including 18 individuals who surrendered from West Java. Lastly, two siamang infants were handed over from Bali.

The species of gibbon that have been surrendered to the authorities comprise several species. The communities in the Sumatra and Kalimantan regions exclusively keep the gibbon species whose habitats are situated on these islands. This differs from Java and Bali, where communities keep species such as *S. syndactylus*, *H. agilis*, *H. muelleri* and *H. albibarbis*, which do not naturally inhabit these islands. It is highly likely that the gibbons currently being kept were procured through illegal trade.

Origin and motives behind illegal gibbon keeping

Based on the provided caption, it can be inferred that most gibbons held by communities were obtained through fortuitous circumstances, a trend observed across all regions (N = 55). Typically, gibbons were obtained from the wild, plantations, village mining, local resident’s homes, deposited from families or friends, and even near the riverbanks and the roads. Illegal gibbon trading was identified in various regions, including Central Kalimantan, Jakarta, Lampung, Riau, and West Kalimantan (N = 10). In this study, 10 gibbons were illegally traded worth IDR500,000 in 2012, IDR300,000 in 2015, and IDR1,500,000 in 2022 respectively. It is important to note that all the gibbons above were traded during infancy. In addition, individuals procured gibbons from acquaintances or families (N = 10), or captured ones that had previously escaped from cages (N = 4). Notably, only a few gibbons were acquired through hunting (N = 3), all located in the Sumatra region.

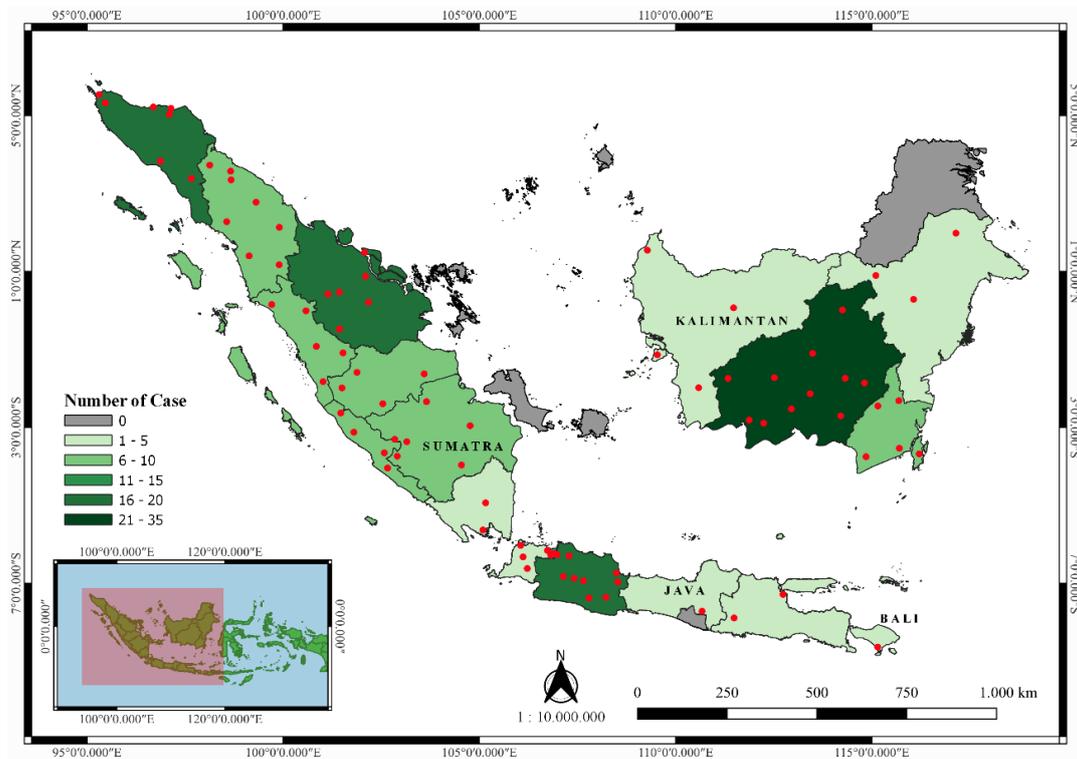


Figure 3. Locations of surrender cases in four islands. The greater the intensity of hue in a province, the higher the incidence of gibbon surrender cases. Dots were pointed at the district level

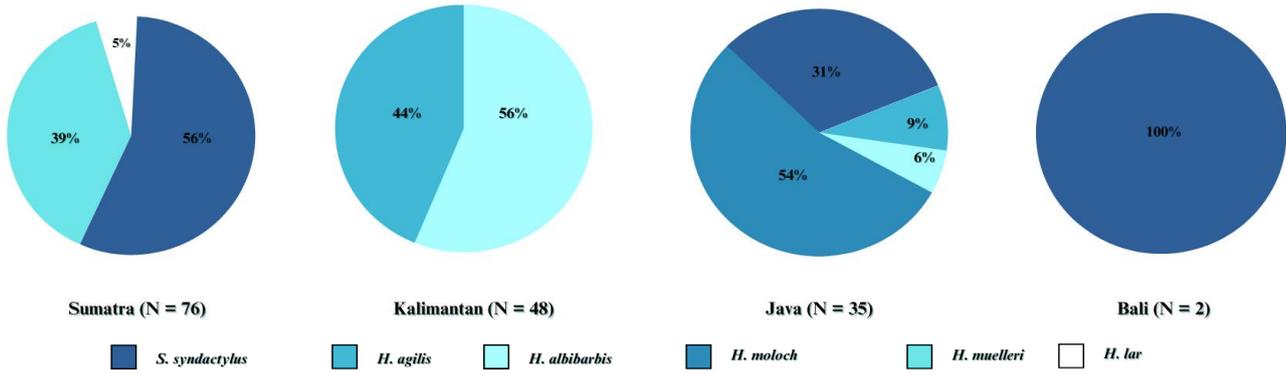


Figure 4. The surrender of gibbon species occurred on a per-province basis. Note that in Java, all species except *H. moloch* are non-native, whereas in Bali, there has never been any historical record of gibbon presence

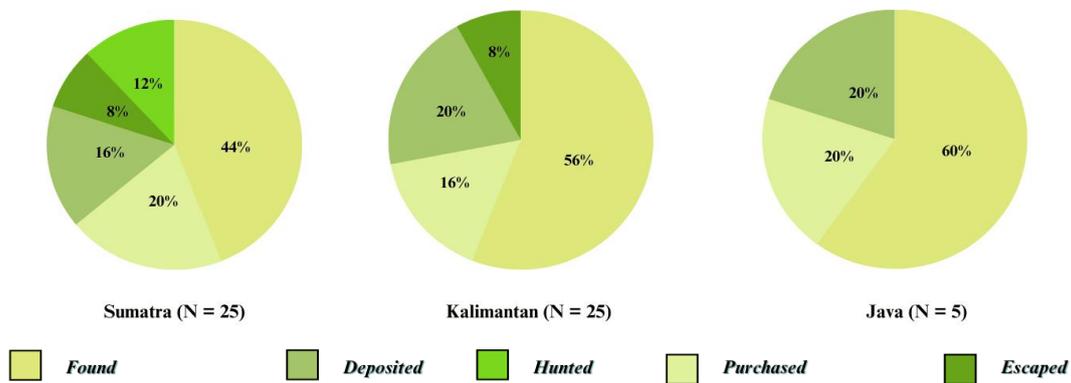


Figure 5. Origin of gibbon kept as pets according to captions provided in social media posts

Not all uploaded posts contain information regarding the motivations for surrendering the pet gibbons. The first record of the handover from the former owner was in 2016 (Figure 6), when a resident of Tasikmalaya in West Java surrendered one individual Javan gibbon through a persuasive approach by the authorities. In the first two years of monitoring, the legal consequences were the main motive for gibbon pet submission to authorities. The handovers continued to increase in the following years, except in 2020, when the restriction policy was enacted. The trends increased the year after and decreased at the end of 2022.

This study found three motives behind the surrender of gibbons to the authorities, which does not apply to all species analyzed. Of 89 posts, half of handover events (N = 46) were due to legal persuasion, which involved persuasive interventions from the authorities. Legal persuasion included cases such as the failure of zoos to renew their permits, operations or patrols by the authorities in residential areas where pet gibbons had been identified and a persuasive approach from authorities following public reports, known as “satron”. During *satron* operations, the authorities will explain the legal consequences of keeping a gibbon; thus, the owner can hand over the gibbon to the authorities without punishment. In these cases, the owners often said they did not know gibbons were protected. A change followed this in perception or understanding towards the law or the

gibbons’ Endangered status (N = 30). Finally, the inability to handle the gibbon (N = 13) as they mature showed aggressive behaviour.

Surrender patterns

Two different patterns emerge when owners intend to surrender their pet gibbons (Figure 7). Firstly, the owner wishing to surrender the gibbon must contact the BKSDA to apprise them of their desire to release the gibbon back into the wild (Figure 7A). The authorities will visit the gibbon keeper’s house to carry out the handover process. Sometimes gibbon owners visit the BKSDA office directly to hand over their gibbons. From the conservation perspective, the owner typically seeks out information regarding the legal status and protection of gibbons independently, especially from the internet. Thus, the motivation is classified as “Initiative” in this study. Secondly, the authorities receive reports from a neighbor or, in recent years, from netizens that there are gibbons that the owner wishes to relinquish to the BKSDA (Figure 7B). Conversely, with the previous pattern, it is generally because the authorities visit the owner’s residence and expound upon the legal consequences if the owner does not surrender their pet gibbon. As a result, the owner feels more secure and will not face legal consequences if they surrender the gibbon. If the gibbon attacks or bites, the second pattern will inevitably ensue, and the owner will surrender the gibbon to the authorities.

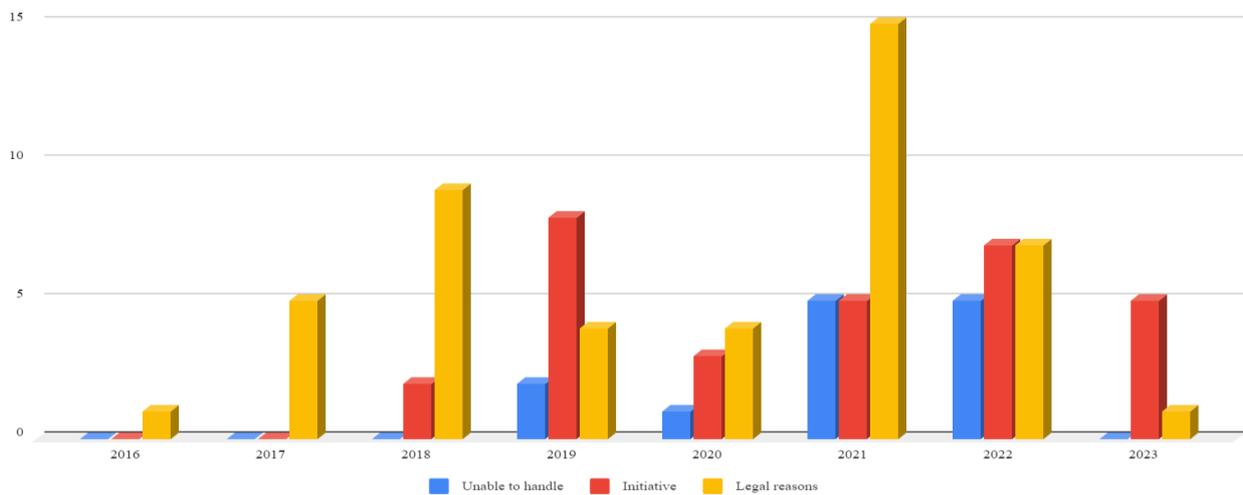


Figure 6. The reasons behind the surrender of pet gibbons during the monitored period

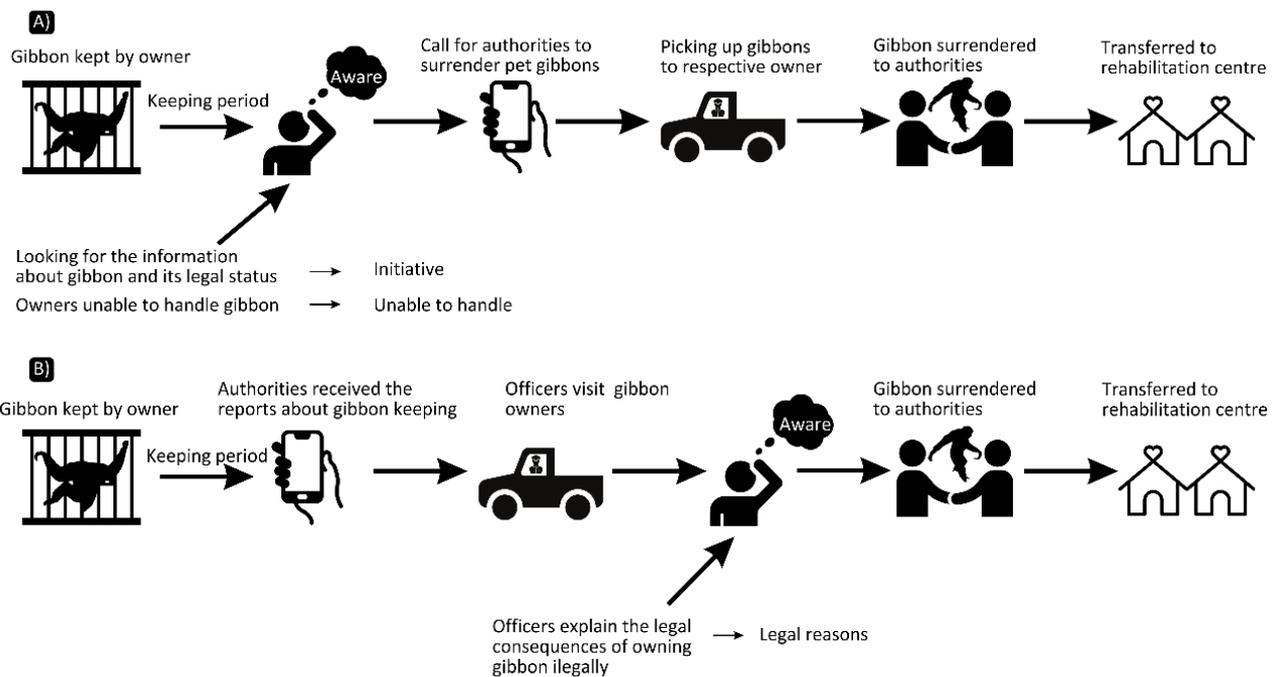


Figure 7. Patterns of surrendering pet gibbons to authorities in Indonesia. The patterns likely associated with the motives found in this study

Discussion

Documentation and records of gibbon surrenders in Indonesia are not publicly accessible or stored centrally, making the compilation process very challenging (Sherman et al. 2020; Aldrich and Neale 2021). Researchers who needed information regarding the wildlife surrender had to contact the authorities of each province to obtain information on these surrender data. The data in the findings of this study may not be representative of the actual data due to (1) limited sources of information, as not all BKSDA social media accounts upload surrenders; (2) differences in the definition of surrenders between BKSDAs, therefore the researchers must be meticulous in

interpreting the captions of the uploaded posts. Understanding the reasons behind the surrendering of pet gibbons is important for education and awareness activities (Wu et al. 2018). Up to this point, anecdotal evidence and claims by authorities indicate that former owners surrendered their pet gibbons due to education and awareness activities performed by officials. The findings in this paper suggest that not only is education and awareness in the community increasing, but there are other motivations, such as the fact that pet gibbons are starting to bite or attack (since the gibbons reach sexual maturity) and fear of legal consequences are common reasons for people to hand over their pets.

The increase in the frequency of relinquishing gibbons to the authorities can be interpreted as an indication of heightened public apprehension for gibbon preservation. The motive behind surrendering gibbons has transformed from being driven by law enforcement to a self-triggered decision and the caretaker's incapability to cater to the gibbon's welfare. The inability to handle was associated with the increasing aggressiveness of gibbons (e.g., biting, "attacking") as a result of their sexual maturity (Duarte-Quiroga and Estrada 2003; Cheyne 2009). This category comprised owners who wanted to surrender their gibbons because they could not handle them anymore or may have been injured or threatened by them. Gibbons can also sometimes escape from the cages and attack people nearby. For instance, on 28 April 2022, a toddler in Riau got bitten by an agile gibbon and on 12 September 2021. In another incident, children in Central Kalimantan received 20 stitches from being attacked by a white-bearded gibbon. Hence, the wildlife bite incident has drawn attention to the potential spread of zoonotic disease from animals to humans and vice versa (Devaux et al. 2019). Adult gibbons can certainly injure the people who care for them. This can be used as educational material and awareness regarding how "cute animals" can be dangerous when kept. Hence, the key message that can be conveyed is that wild animals are not to be kept.

This study additionally highlights the delay between the patterns of trading and the release of pet gibbons. For example, the online trade in gibbons, for example, peaked in 2020 (Abdi et al. 2021), while handovers peaked in 2021 (Figure 2). This is predictable as it takes time for gibbon owners to become aware of the law or to be unable to keep the animals longer. This delay evidences that while most traded gibbons are infants, most handovers are adolescent gibbons (Abdi et al. 2021; Nijman et al. 2021). This pattern is similar to the delay on domestic pet animals, where the keeping trend needs some time to emerge (Militz and Foale 2017; Nijman and Nekaris 2017). In the context of illegal gibbon keeping, the delay is likely because maturity in gibbons takes several years. During the juvenile phase (3 to 5 years old), gibbons reach their sexual maturity, and this is when they become aggressive, more powerful and more difficult to handle (Brockelman et al. 1998; Cheyne 2009).

Among Hylobatid species in Indonesia, siamang is the most commonly traded and surrendered species (Abdi et al. 2021). However, agile and Javan gibbons are traded for similar amounts online, but handovers of agile gibbons were much higher than Javan gibbons. When comparing the locations of handovers to trade hotspots, gibbon handover events occurred mostly in Sumatra and Kalimantan, whereas most of the gibbon traded online comes from Java (Abdi et al. 2021; Nijman et al. 2021). One possible explanation is that the profile of gibbon owners in Java tends to be wealthier. Therefore, they can afford to pay for large cages and assistants to care for the gibbons when they become bigger and more difficult to handle. In contrast, in Kalimantan, gibbon owners usually obtain their gibbons by hunting rather than from the pet trade. Additionally, authorities seem to be more tolerant towards pet keeping in Java as many pet owners in the

region are public figures and high-ranking officials, such as military personnel. Another explanation for this is that due to the high level of illegal trade and more frequent seizures in Java, authorities in Java have fewer resources to take action against pet owners (Pires et al. 2021; Adhiasto et al. 2023).

In terms of obtaining gibbons, half of the owners claimed to find them in the wild as well as in various locations. This event resembled the observations made by Freund et al. (2017) concerning orangutans. Since it is based on the owner's statement, interpretation must be careful because they may not be sincere in providing information due to fear of legal repercussions. Furthermore, it is a bit suspicious if the owners obtained the gibbons after discovering them in the forest, especially if the finders claimed they were found by dogs (Profauna 2015), even if gibbons occur outside protected areas (Setiawan et al. 2021). In Indonesia, primate poaching typically involves dogs, causing the parent primate to flee and possibly causing the infant to fall (Koster and Noss 2014; Yudha et al. 2022). In addition, hunters often utilize air rifles for hunting since these kinds of tools are easy to purchase (Luskin et al. 2014). In addition, gibbon owners purchase gibbons, meaning buyers can easily obtain gibbons that are traded online. Despite being protected, gibbons are readily purchased because they are adorable and resemble human babies (Seaboch and Cahoon 2021). The gibbon trade is frequently advertised with appealing words like "living doll", "safe to keep", "suitable for accompany", and other appealing wording strategies observed by Seaboch and Cahoon (2021) in their study.

Ex-owners' inability to relinquish pet gibbons to the authorities differs from the surrender of birds of prey. Eagle owners, for instance, were compelled to surrender their eagles to the authorities because of their incapacity to afford the costlier meat (Utamidata 2017). This is due to the increase in feed necessities as the eagle matures. Although the cause of incapacity is a minor consideration in gibbon keeping, this can be leveraged to increase public consciousness regarding the relinquishment of pet gibbons to the appropriate authorities (Wu et al. 2018). Therefore, education on conservation status slightly affects potential buyers. This evidence can be used as a substitute educational message for the community (Moorhouse et al. 2017; Gursky and Fields 2018). For example, in Thailand, informing society about the traumatic events experienced by pet gibbons alters people's attitudes towards its conservation (Osterberg et al. 2014).

From a rehabilitation standpoint, the transfer of gibbons, especially non-native Hylobatid species, significantly impacts rehabilitation expenditures, in addition to the operational cost of gibbon sustenance. Following established protocols, these gibbons must be relocated and reintroduced to their natural habitat in accordance with established protocols (Campbell et al. 2015). This process may increase costs associated with relocating gibbons to their natural habitat. Additional expenses, such as DNA testing, must confirm the gibbon species to avoid mishaps during the release process (Campbell et al. 2015; Mitman et al. 2021).

This research attempts to fill the knowledge gap regarding the number of wildlife pets surrendered to Indonesian authorities using the conservation culturomics approach. When performing a conservation culturomics study, this study found that there were some inconsistencies in how the online media wrote between “surrendering” and “confiscation”. Therefore, to overcome this issue, the author defines and limits the definition of “surrender” based on the conservation context where people surrender their pet primates to authorities and receive no sanctions (Sherman et al. 2020). While official and accurate data are not publicly available, the number of surrenders may differ slightly from the government’s data. Since the data in this study completely relied on government Instagram posts, it is encouraged for future researchers to perform interviews with officials and, if permitted, obtain the data of surrendered wildlife pets to rehabilitation centers. The culturomics approach can compile the scattered data on social networking sites such as Instagram. Therefore, combining social media data with media coverage can be utilized to investigate trends and patterns regarding wildlife keeping (Paudel et al. 2022).

To conclude, these results suggest that law enforcement – direct or persuasive – still plays a key role in the handover of gibbons kept as pets. Authorities can work with non-governmental organizations on investigations and sting operations to reduce the number of illegal gibbon trades. However, without adequate penalties, there is no deterrent for the public to refrain from purchasing protected species.

The dangers associated with the ownership of wild animals must be communicated to the general public. To achieve this, awareness and educational initiatives can be implemented to raise the current generation’s awareness. In the present context, social media can serve as a medium for disseminating important information targeting the millennial generation (Chan et al. 2020). Social media possesses certain features and algorithms that allow for the rapid popularity of a particular issue. In this educational process, the primary message can revolve around the significance of gibbons in their natural habitat, the potential for zoonotic transmission, and the inherent dangers of being bitten or attacked by gibbons. Awareness and education about gibbons can also be carried out in settlements near gibbon habitats to prevent their hunting. The education above could include participation in communal activities that attract a considerable number of individuals, such as village clean-up ceremonies, routine recitals of the Koran, and Posyandu (community health centers) gatherings, which can also be utilized as a platform for the distribution of informational material, in addition to conventional media channels, such as public service advertisements on radio and television.

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