How and Why People Provision Primates

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Abstract: Primates are provisioned by people in diverse contexts, with significant implications for humans, primates, and their ecosystems. Provisioning is a complex human-primate interaction shaped by numerous factors with both parties influencing each other's behavior. In many cases, unregulated provisioning of primates is not problematic to either humans or primates. However, there are also many examples of negative consequences resulting from provisioning, which can lead to widespread media coverage, pressuring those responsible (for example, policymakers and local authorities) to resolve these issues. Current management strategies focus on signage and drastic methods such as the translocation of primate groups or population control. So far, however, these approaches have proven largely ineffective. Abrupt cessation of provisioning may harm primates by depriving them of food they rely on, and humans may be harmed by increasing negative encounters in other contexts. Research and management strategies often focus on the provisioned primates rather than their human provisioners, limiting the understanding of this interaction. To encourage a more balanced approach by conservation practitioners looking for ways to manage challenging situations, we examined the existing literature and incorporated personal observations from primate conservation practitioners on how and why people provision primates and the efficacy of existing management strategies. We suggest that using an ethnographic approach to understand the human dimension of this two-way interaction may pave the way for more innovative and effective strategies that can enhance both human and primate well-being in these contexts.

Key words: Feeding, human-primate interactions, management, provisioning

Introduction

Provisioning of wildlife by humans occurs worldwide. Defined as "the offering of food to wildlife beyond the natural availability or quality of food resources in their environment" (Fa 1986), provisioning has a broad gamut and can be both intentional (direct or active) and unintentional (indirect, passive or inadvertent) (Dubois and Fraser 2013). Primates consuming agricultural crops or procuring food from garbage sites are forms of unintentional provisioning. Intentional provisioning (provisioning henceforth), which is the deliberate feeding of primates by people and the focus of this review, has historically been a common form of human-primate interaction across cultures and contexts (Asquith 1989; Sugiyama 2015). While it has been found to affect various aspects of primate morphology, physiology, behavior, ecology, and demography (Jaman and Huffman 2013; Sengupta *et al*. 2015; Maréchal *et al*. 2015, 2016; Morrow *et*

al. 2019), studies examining the impacts of provisioned primates on humans have primarily assessed financial losses, relating, for example, to crop-foraging primates, aggressive behaviors of primates towards people, and the potential for disease transmission (see, for example, Xia *et al*. 2017; Devaux *et al*. 2019; Gilhooly *et al*. 2021; Al Ghamdi *et al*. 2023). Yet, provisioning may also have positive effects on human-primate relations, and can aid research possibilities, promote the creation of co-culture, and positively affect human mood and mental state (Asquith 1989; Barua *et al*. 2021; Sueur and Huffman 2024; Hansen and Fuentes, under review).

Provisioning is a complex interaction shaped by social, economic, cultural, and ecological factors, where humans and primates influence each other's behaviors; in some cases, the very nature of the interaction depends on the availability of provisioned food (Fuentes *et al*. 2008; Hsu *et al*. 2009; Sengupta and Radhakrishna 2018, 2020). Yet, attempts to manage these interactions rarely consider why people feed primates in the first place. Much research attention is given to the impacts of provisioning (see above) rather than the human motivations underlying them, thereby preventing an understanding of the full scope of the interaction. In this paper, we address this gap by describing the many ways in which people provision primates. We then discuss the different factors underpinning this practice from an anthropological perspective. Thereafter, we review management strategies and make recommendations focusing on enhancing human and primate well-being in these circumstances.

How People Feed Primates: Ways of Provisioning

Regulated provisioning

Intentional provisioning by people can be both regulated (where anthropogenic food type and/or quantity are predetermined) or unregulated (anthropogenic food type and/or quantity are uncontrolled). Primatology as a discipline sometimes uses regulated provisioning as a research tool (Asquith 1989; King *et al*. 2008; Sugiyama 2015). It enables close observation of primates, and controlled experiments that afford a greater understanding of their behaviors and needs (Asquith 1989; Morris *et al*. 2016). Studies conducted on provisioned groups of free-ranging primates have, however, sparked debates from the very outset. Researchers have argued that provisioning itself can have such significant impacts on primate behavior and demography that these observations are not indicative of their lives in the wild (Asquith 1989). Nevertheless, regulated provisioning continues to be employed to advance our understanding of various aspects of primate biology. Foraging experiments, for instance, have been used to study social interactions, group coordination, social learning, cognition, memory, strategic planning and decision-making in various primate species (for example, Marshall *et al*. 2013; Pyritz *et al.* 2013; Barrett *et al*. 2017; Canteloup *et al*. 2021)

Regulated provisioning has also been implemented as a short-term measure to compensate for temporary food shortages in primate habitats, and, although long-term effects have not been documented, some positive short-term results are available. For example, Barbary macaque groups (*Macaca sylvanus*) were fed acorns in Bouhachem forest in Morocco after a wildfire destroyed natural forage and led to one group travelling outside their regular home range to forage in agricultural fields. To prevent problems arising from the group's ranging behavior, the macaques were provided with acorns during the winter months at sites deep in the forest and away from the public. The macaque group did not become habituated to humans, or to being fed, and the provisioning period coincided with a cessation in the group's crop foraging (Waters and El Harrad 2023). In Cape Town, South Africa, where chacma baboons (*Papio ursinus*) had adapted to a human-modified environment and foraged on anthropogenic food sources, short-term provisioning was used as a low-cost, low maintenance strategy to reduce spatial overlap between humans and baboons and reduce negative interactions (Kaplan *et al*. 2011). Regulated provisioning of primates to increase their visibility to tourists is also widespread in primate range countries (Knight 2009; Badiella-Gimenéz *et al*. 2021; Hansen, Kaburu *et al*. 2023). Across Asia, primate tourism involves the formation of designated 'monkey parks' where the management staff place feeding stations at strategic locations (Russon and Wallis 2014).

Unregulated provisioning

Unregulated provisioning is common at incidental primate tourism sites where the primary motivation of visitors may not be to interact with primates but they do so because wild primates are present (Grossberg *et al*. 2003). Examples include populations of macaques, baboons, and colobines that are common at tourist attractions, hotels, roadsides, and temples or other religious sites across Africa and South and Southeast Asia (Fig. 1) (for example, Ilham *et al*. 2016; Maréchal *et al*. 2016; Brotcorne *et al*. 2017; Peterson and Riley 2017; Sengupta and Radhakrishna 2020; Riley *et al.* 2021). Reports of unregulated provisioning of monkeys in South and Mesoamerica are becoming more frequent, including cases involving tufted capuchins (*Sapajus nigritus*) (Tugajue *et al*. 2023) and spider (*Ateles geoffroyi*) (Fig. 1) and howler monkeys (*Alouatta pigra*) (Franquesa-Soler and Spaan 2023). It is important to note that provisioning can also be unregulated in an otherwise managed setting. For example, until 2018, visitors were allowed to feed long-tailed macaques (*M. fascicularis*) bananas at the Ubud Monkey Forest in Indonesia, a managed primate tourism site (Howells *et al*. 2022).

Figure 1. Primates consuming food provided by people. **Top left:** Hanuman Langurs, India. **Top right:** Long-tailed macaques in a street in Lop Buri, Thailand. **Bottom left:** Hamadryas baboons in Saudi Arabia. Photos courtesy of Paula Pebsworth. **Bottom right:** Geoffroy's spider monkey in Mexico. Photo courtesy of Denise Spaan.

Why People Feed Primates

People's motivations for feeding primates range from deriving individual emotional satisfaction to social or cultural reasons. Interestingly, certain primate behaviors themselves may influence humans to engage in this practice, as seen in studies using an ethnoprimatological lens (Riley *et al*. 2023). In this section, we explore the varying and non-mutually exclusive reasons influencing or underlying provisioning.

Individual reasons why people feed primates

Orams (2002) suggested that "the sharing of food is more complex and fundamental for humans than simply a means of getting close to animals. The sharing of food is a fundamental part of human nature…". Primates are often referred to as childlike (Russel 1995; Knight 2011), enhancing the emotional need to care for them. Additionally, feeding primates is underpinned by emotional responses such as pity or a perceived innate connection to them (Suzin *et al*. 2017; Franquesa-Soler *et al*. 2023). For example, primates may be perceived to beg at tourist sites or roadsides, fostering the perception that the animals are hungry due to the paucity of natural resources (Morrow 2018). In such situations, people feel sorry for them and willingly share their food (Sengupta and Radhakrishna 2020; A. Kitegile pers. obs., M. F. Hansen pers. obs., M. Ferreira da Silva pers. obs.). These views align with those expressed in interviews with tourists visiting black-tufted-ear marmosets (*Callithrix pencillata*) in a city park in Brazil (Leite *et al*. 2011). The majority of people believed the marmosets were starving and needed to be fed by the park authorities, despite the study providing evidence that the animals were healthy. Furthermore, people seemed to perceive the wild marmosets in the park as pets or zoo animals, which needed to be looked after (Leite *et al*. 2011).

In Japan, primatologists believed that it was essential to continue provisioning macaques in monkey parks because they had become used to being fed by people, thereby losing their natural foraging ability (Mizuhara 1967 in Knight 2011). Provisioning of urban primates is also common, possibly due to the proximity of and familiarity with primate individuals and groups (Back and Bicca-Marques 2019). This form of provisioning might also be driven by people identifying with primates as individuals living in challenging conditions in which food is scarce. For instance, in southern Mexico, residents feed spider monkeys spotted in cities as they believe that deforestation around urban areas causes the monkeys to come to the city in search of food (D. Spaan, unpubl. data) with a similar situation reported for long-tailed macaques in Penang, Malaysia (M. F. Hansen, pers. obs.).

Among other reasons, people often provide food to wild primates due to a perceived moral obligation that encourages the sharing of resources with these animals. Ilham *et al*. (2018) highlighted that many tourists in Gunung Padang felt that feeding monkeys was a way to connect with nature and demonstrate compassion for other living beings; this act of generosity was frequently regarded as a reflection of good manners and respect for the natural world. Such interspecific altruistic behavior has been shown to increase tourists' self-esteem (Orams 2002) and may lead to overall emotional or mental health benefits for people (Curtin 2009; Barua *et al*. 2021). Sharing food with primates might also be a way to facilitate the creation of a relationship between primates and people. Knight (2011) described the special experience of Japanese primatologist, Naonosuke Hazama, when he succeeded in feeding a Japanese macaque (*M. fuscata*) for the first time, highlighting that the acceptance of food was an implicit agreement of trust between a primate and a human, from which a safe relationship could be developed.

Socio-cultural reasons why people feed primates

Primates are often fed for religious reasons (Sengupta and Radhakrishna 2020). For example, the long-tailed macaques frequenting the temples of Bali are perceived to have "human-like intelligence" due to their appearance at rituals to consume offerings, often waiting to do so after the food is sanctified (Peterson and Riley 2017: p.213). In India, primates are seen as living incarnations of the Hindu deity, Hanumān, and feeding monkeys is considered an act of obeisance (Barua and Sinha 2021). People have further indicated that devotional feeding of primates has enabled them to cope with and overcome misfortune and/or mental illness without resorting to healthcare professionals (Barua *et al.* 2021). In Jodhpur, Rajasthan, India, people visit city parks with the intention of feeding Hanuman langurs (*Semnopithecus entellus*) as a good deed. Astrologers in Jodhpur further consider feeding monkeys to be a form of worship and say that provisioning them is equivalent to feeding gods (P. Pebsworth, unpubl. data).

In Gunung Meru, Indonesia, the primary reason for feeding long-tailed macaques is also deeply rooted in local beliefs. The presence of graves belonging to mythical Muslim warriors nearby has led the community to regard these monkeys as their incarnations, thereby associating the act of feeding monkeys with the hope of receiving good fortune in return (Koyama 1984). Further, the *Qur'an,* the Islamic sacred scripture and specific 'hadiths' prohibit Muslims from wasting food and being unkind to animals. Provisioning primates addresses both these issues. For example, in Saudi Arabia, some people give excess food that would have been otherwise wasted to hamadryas baboons (*P. hamadryas*) (P. Pebsworth, pers. obs.). Chinese Buddhists living in Penang, Malaysia, expressed fear of monkeys, but said that they had to feed them regularly because it was a way to obtain good fortune. Driving to where the monkeys lived, they threw food out of their car window as quickly as possible without interacting in any other way with the monkeys (M. F. Hansen, unpublished data). Socio-cultural backgrounds and histories are diverse and plentiful throughout primate-habitat countries, and yet, the ways that primates feature in people's worldviews across these countries remain understudied. The few examples provided here do not cover the vast array of human cultures but will hopefully encourage further research and consideration of this complexity.

Primate behavior influencing human provisioning behavior

Studies guided by ethnoprimatology have revealed that particular primate behaviors influence humans to engage in provisioning, thereby clearly showing that humans and primates in shared spaces mutually impact each other's lives. For instance, in India, >50 % of tourist respondents said that they provisioned rhesus macaques (*M. mulatta*) as they feared their aggressive behaviors or felt sorry seeing them make "begging" gestures (Sengupta and Radhakrishna 2018). Long-tailed macaques in Indonesia have developed a reliable "rob and barter" behavior that ensures human provisioning; they take inedible items like glasses, phones, or flip flops from unsuspecting tourists, and then maintain possession of the item until a suitable food item is offered in exchange (Brotcorne *et al*. 2017; Peterson *et al*. 2022). Rhesus macaques have also been observed "robbing and bartering" in India (Kaburu *et al*. 2019). "Robbing and bartering" in long-tailed macaques was most successfully performed by individuals that practiced and acquired this skill prior to adulthood, which suggests that there is an ontogenetic component to this behavior. Furthermore, adults were more likely to reject less preferred items in favour of higher-valued items compared to sub-adults, illustrating that the monkeys understand the value of the object they have taken relative to the value of the food token offered. This complex behavior requires interspecific interaction and understanding, and it has become embedded through social learning in both the local staff and the macaque groups (Brotcorne *et al*. 2017, 2020; Leca *et al.* 2021; Peterson *et al*. 2022). This form of human-primate communication also seems to

be the case for the coo-call with hand extension behavior observed in bonnet macaques (*M. radiata*) in southern India, where female macaques began coo-calling and extending their hand toward people as if to solicit food (Deshpande *et al*. 2018; Sinha *et al*. 2021). Because some people reacted positively to the request, this behavior has now been transmitted both horizontally and vertically to other individuals of the macaque group. In these examples, macaques actively engage in interspecific interactions with people and through these behaviors create local traditions together that could be ways for both to coexist (Deshpande *et al*. 2018; Sinha *et al*. 2021; Hansen and Fuentes, in review).

Feeding primates is also used as an instrument of control over the animals, such as ensuring their presence at tourist sites (Knight 2011). Those associated with the tourism sector may encourage tourists to feed primates despite its prohibition, and, in the hope of a tip, encourage tourists to get closer to the primates for photographs (Shackley 1996; Zhao 2005; Knight 2010; Sengupta and Radhakrishna 2020). Many sites include locals selling food for monkeys and some sites have individuals engaged in rescuing tourists from aggressive monkeys (Zhao 2005). Indeed, vendors selling food for monkeys have a vested interest in the continuation of provisioning. For instance, during the pandemic, Barbary macaques frequenting the roadside in Ifrane National Park, Morocco, began to return to the forest when they were deprived of provisioned food. Site vendors, fearful of losing future revenue from sales of monkey food, clandestinely gave bread to the macaques to encourage them to stay (A. El Harrad, pers. comm.). The construction of new roads further encourages vendors to sell food to passing motorists. In Sulawesi, Indonesia, the accumulation of food waste from roadside vendors may have encouraged previously shy moor macaques (*M. maura*) to spend time at the roadside, which, in turn, made them more visible to passing motorists who then began provisioning them (Riley *et al*. 2021). Bus and taxi drivers also benefit from taking tourists to sites where they can observe and provision wild primates. For instance, in the Riviera Maya, Mexico, tour bus and taxi drivers take tourists to convenience stores frequented by spider monkeys and offer to buy bananas so the tourists can get closer to the monkeys, take photos and feed them (D. Spaan, pers. obs.). In Gibraltar, a substantial percentage of interactions occurred repeatedly between tourist bus and taxi drivers and Barbary macaques because the drivers encouraged the macaques into closer proximity to tourists using food (Fuentes *et al.* 2007).

Management Strategies

We acknowledge that many centuries-old cultural and religious provisioning practices can be sustainable. Here, our focus is on sites where interactions between provisioned primates and people have become problematic, resulting in negative human-primate interactions. Such interactions may receive wide media coverage. For instance, rhesus and bonnet macaques, species that are commonly provisioned by people actively or inadvertently, have been reported as 'running amok', 'creating havoc' or 'invading parliament' by the Indian media (Barua and Sinha 2019). In Thailand, where provisioning primates at religious shrines had become a tourist attraction, large numbers of long-tailed macaques running around the city during COVID-19 led to headlines such as "Monkey brawl in Lop Buri shocks humans" (Bangkok Post 2020). In Mexico, videos of spider monkeys taking bananas from hotel buffets are going viral on TikTok with captions such as "two monkeys stole the breakfast at a hotel in Cancun" (D. Spaan, pers. obs.).

The frequency and intensity of negative human-primate interactions around provisioning and the resulting media attention can lead to some primate species being labelled 'pests' or 'problem' animals. In Malaysia, for example, long-tailed macaques generated the highest number of public complaints to the Department of Wildlife and National Parks in 2018 resulting in the culling of thousands of macaques (Department of Wildlife and National Parks Peninsular Malaysia 2018). Translocation is also used in such situations (Strum 2005, 2010) but is usually costly and often unsuccessful. For example, in India ~19,000 macaques were captured and translocated over a decade with little positive outcome (Barua and Sinha 2019), and substantial negative impacts have been reported by local people (Govindrajan 2019). Attempts to curb larger group sizes resulting from provisioning that have focused solely on population control measures have proven ineffective as well (Shimizu 2012; Karuppannan *et al.* 2013; Brotcorne *et al*. 2017; Deleuze *et al.* 2021). Theories as to why the long-tailed macaque sterilization project conducted in Ubud, Bali, Indonesia, has not stopped population growth include annual sterilisation rates being too low, and challenges in capturing individuals. In addition, stabilising a population requires that a high proportion of sterilised females and sterilisation efforts be maintained over time (Brotcorne *et al*. 2023). Abrupt cessation of provisioning can also have deleterious effects, as evidenced by human lives being disrupted during the pandemic when the total absence of visitors at tourist sites led to primates moving to nearby residential areas in search of food (Royle 2020).

Given the socio-cultural underpinnings of primate provisioning across many contexts, total bans on feeding are not practical or, in some societies, may not be ethical to implement. Court orders banning the feeding of macaques in Delhi by devotees failed even though designated places where monkeys could be fed were provided (Barua and Sinha 2019). Even when provisioning has no connection to religious practice, people continue to feed primates despite being provided with clear information as to why it is inadvisable (Garcia de la Chica *et al*. 2023). The complex issues that can surround the provisioning of primates by people is illustrated by the numbers of primate-related complaints received by the authorities in Delhi, for example, even as the

complainants continued to feed primates for religious reasons (Gandhi 2012).

The abrupt cessation of provisioning in Lop Buri, Thailand, and its effects on primate behavior mentioned above led to Thai authorities provisioning the monkeys themselves and to begin a sterilisation programme to curb macaque numbers. Nevertheless, since 2023, the annual monkey feeding festival has resumed in Lop Buri with long-tailed macaques frequently seen in the streets. Reports from other parts of Asia suggest that macaques returned to forage on natural foods when provisioning ceased during the pandemic (Lappan *et al.* 2020; M. F. Hansen, pers. comm.), however, when the visitors returned to the tourism sites, so did the macaques (M. F. Hansen, pers. comm.).

Signage is often used to discourage people from feeding primates but there appears to be little evidence that signage alone discourages the behavior. In South Africa, for instance, signs advising people not to feed chacma baboons and to keep their car doors and windows closed failed to discourage feeding, and baboons were observed climbing into cars even when children were in the vehicle (N. Krichelberg, pers. obs.). Signage also proved ineffective at stopping people feeding lion-tailed (*M. silenus*) and bonnet macaques at a tourist hotspot in the Western Ghats (J. Correa, pers. obs.), or rhesus macaques in the foothills of the Eastern Himalayas, India (Sengupta and Radhakrishna 2018). Signs banning feeding surrounding Baluran National Park, East Java, and Bantimurung Bulusaraung National Park, Sulawesi Indonesia, are similarly largely ignored (M. F. Hansen, pers. obs.; E. P. Riley, pers. obs.).

In many parts of India, fines imposed by the Forest Department on those feeding wildlife have been ineffective at preventing provisioning (Sengupta and Radhakrishna 2020). However, provisioning was reduced with the introduction of a small fine levied by park rangers in the Western Ghats (J. Correa, unpubl. data). Similarly, in Singapore, signs combined with fines have been somewhat effective although they have not been able to prevent provisioning entirely (Riley *et al*. 2015; Riley *et al*. 2016).

Mixed messaging is also a problem. For instance, at the Nanking Monkey Tourism Park in China, notice boards and tour guides advised tourists not to provision monkeys with food they brought with them. However, tourists were still able to buy food in the park to feed the monkeys. Instead of stopping the sale of monkey food to the public, the park constructed numerous wooden "cages" to protect dining tourists from the macaques and recruited security guards to monitor the tourists' behavior. The park has also increased the amount of food given to the macaques assuming it will make them less interested in human food (Cui *et al*. 2021).

While feeding bans might not be effective by themselves, they are useful in combination with other methods. For example, a holistic strategy in Hong Kong encompassing a sterilisation programme, a feeding ban, education, and the use of macaque-proof bins, implemented with the active support of the government, led to a 30% decline in the birth rate of rhesus macaques, and a decrease in reporting of negative human-macaque interactions. It should be noted that this population was already restricted in movement and of limited size to begin with (Shek and Chen 2010)—both factors contributed to the success of the strategy. Such multipronged approaches may be ineffective in countries with larger macaque populations across South and South-East Asia, and costs would be prohibitive.

A holistic approach with finely regulated provisioning can itself be employed to mitigate negative human-primate interactions. In South Africa, for example, an artificial food patch was introduced in a natural habitat in the range of a group of chacma baboons, and after combining this approach with wire-mesh fencing restricting access to urban waste sites, researchers observed the baboons spending less time in urban areas (Kaplan *et al*. 2011). Intentional planting of local tree species can also provide food for primates in heavily modified landscapes, reducing instances of crop-foraging, entering homes and procuring food from rubbish bins. The Wildlife Department of Gurugram, India, has planted thousands of wildlife-supporting trees in an effort to better manage the human-rhesus macaque interface in urban areas (Roy 2021).

Discussion

Managing intentional, unregulated primate provisioning is challenging due to the diversity of provisioning practices, species-specific behavioral differences, and site-specific contexts. Given these complexities, place-based and evidence-driven solutions are essential. Intentionally feeding primates can have both positive and negative outcomes. Any form of provisioning must, therefore, be continuously evaluated to ensure it is not detrimental to the primate population, the ecosystem and the local community.

A study in India found significant differences between people who provisioned primates at two different sites, with numerous motivations playing a part, thereby emphasising the need for in-depth qualitative and quantitative studies on both primates and humans to design interventions that account for heterogeneity of beliefs and other contextual factors (Sengupta and Radhakrishna 2020). We recommend taking an interdisciplinary approach, integrating ethnographic, ethological and ecological observations when conducting research on provisioning of primates. A harm-reduction approach, common in public health, may be useful to understanding how different stakeholders are affected by and engage with primates. Equally important are culturally-sensitive, inclusive and feasible approaches to producing actionable change (Gallagher *et al*. 2022).

Changing provisioning behavior is difficult because many people perceive feeding primates as an enjoyable and effortless activity. Finding an equally enjoyable but less intrusive behavior to replace provisioning may result in reducing these close interactions. Such an approach has been used for other wildlife. For example, forced perspective

photography, where tourists strike different poses in relation to an object in the distance, was successfully used in Hawaii to encourage tourists to keep 10 m away from basking turtles (Abrams *et al*. 2023). In every case, evaluation of the evidence base is key to understanding success. Suggestions for evaluation include human behavior as benchmarks and a before-and-after-control-impact design to evaluate a campaign's effectiveness (Haley *et al*. 2023). Haley *et al.* (2023) encourage practitioners to publish details about failed campaigns in addition to ones that are successful so that we can learn what works and also what does not.

The way forward

Traditionally, management actions have focused on trying to eliminate provisioning and mitigate its effects on primates such as expanding group sizes and increased aggressive behavior (within groups, between groups, and between people and primates). Although there is a lack of empirical data across all socio-cultural contexts in which provisioning occurs, we hope our review of the human perspective of provisioning will help practitioners develop innovative and, possibly, more effective solutions to issues arising from provisioning. We also hope that our overview encourages more research on the topic. We recommend the careful development of campaigns to focus on changing human behavior using a multi-faceted approach. Such an approach should be based on the collection and analysis of qualitative data to provide a thorough understanding of people's motivations for feeding primates.

We encourage the following actionable steps to address provisioning and its impacts:

- Improve communication of the negative effects of provisioning to a wide audience through popular articles, podcasts, short films, infographics on social media, all based on scientific evidence.
- Strive to prevent provisioning from becoming an accepted activity, particularly in areas that could prove dangerous to both people and primates, such as roadsides.
- Encourage people at sites where they are allowed to provision to feed only natural resources or commercial food made for primates (e.g., monkey chow) rather than calorie-rich junk food.
- Commit to reporting both successes and failures in managing this complex human-primate interaction.
- Acknowledge that there is no 'one-size-fits-all' solution for managing interfaces between people and primates. Hence interdisciplinary place-based research is a must for devising site- and context-specific solutions.

The IUCN SSC Primate Specialist Group Section on Human-Primate Interactions is preparing more extensive recommendations to assist primate conservation practitioners in managing the human dimension of primate provisioning. We invite practitioners to share their experiences with us by contacting the corresponding author so we can improve and inform future efforts to manage the human-primate provisioning interface. If you have a case study you would like to share, please contact us.

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