

Ethnoprimatology and Conservation: Applying Insights and Developing Practice

Agustín Fuentes, Amanda D. Cortez, and Jeffrey V. Peterson

Introduction

At its core the ethnoprimateological approach discards the perspective that the human–other primate interface is best seen, and is most often encountered, as a relationship of conflict and competition. While it is true that hunting/predation, deforestation/conflict, and primates as pets/pestilence are core foci for many investigations, such characterizations of the human–other primate interface are limiting in their scope and in what they can provide in regards to moving forward toward sustainability. Ethnoprimatology rejects the idea that humans are separate from natural ecosystems, accepts that humans have moral and ethical responsibilities to the landscapes we alter and modify, and mandates that multiple stakeholder approaches (including other primates) be included in behavioral, ecological, and conservation research with other primates (Fuentes and Hockings 2010; Lee 2010; Loudon et al. 2006; Riley 2010; Fuentes 2012; Malone et al. 2014). Because humans are primates ethnoprimateology discards the “us versus them” perspective inherent in much of the literature and in that vein we use the term “other” primates as opposed to “non-human primates” in this chapter.

To illustrate the current state of the relationships between ethnoprimateological approaches and conservation/management, we provide examples from recent and ongoing work in the following areas: long-term field sites, politics, education, kinship, and multi-stakeholder approach scenarios. Finally, we end with a specific focus on the interface of conservation management, ethnoprimateology, and the role of researchers as active agents in local ecologies. Via each of these topical lenses we demonstrate both how and why the ethnoprimateological approach matters for contemporary primate studies and conservation approaches.

A. Fuentes, Ph.D. (✉) • A.D. Cortez, B.A. • J.V. Peterson, M.A.
Department of Anthropology, University of Notre Dame,
611 Flanner Hall, Notre Dame, IN 46556, USA
e-mail: afuentes@nd.edu

Kinship: Other Primates as Members of Human Societies

We begin with a few examples of the different ways that humans and other primates coexist. While many societies draw a sharp distinction between humans and other animals, others maintain more fluid relationships with other primates. In some human groups, these relationships represent deep connections, both biological and cultural. This fluidity includes primates as pets, food, sacred figures, and persons, often other primates occupy more than one of these roles in what at times seems to be a contradictory nature. Understanding the variety of human-other primate kinship bonds can have substantive implications for conservation.

For the Guajá people of Brazil, monkeys hold an important place as both kin and food. In her pioneering ethnoprimateological work Loretta Cormier (2002) wondered how this seemingly contradictory relationship could in fact be true. Here, monkeys take on social, cosmological, and nutritional roles. In large part, this diversity stems from a very different conception of what it means to be a person (everything in the forest has personhood, or better put shares in the elements that constitute personhood (see Kohn 2013)) and from a central role of endocannibalism, meaning “like eats like” (Cormier 2002: 78). Howler monkeys (*Alouatta belzebul*), in particular, are central to Guajá culture. While other monkey species are present as pets and food, howler monkeys are especially important because for the Guajá, howlers were created directly from humans (Cormier 2002). In Guajá culture, conceptualizations of the world emphasize the continuity between nature and culture, and kinship relations are extended to other life forms. These extended kinship relations allow for the practice of endocannibalism, a practice in which all life forms engage. This means that life forms eat other, related life forms, specializing in those most closely related. Just as Guajá prey on howler monkeys—which were created from Guajá people—Guajá are preyed upon by cannibal spirits, thus continuing the cycle of “like eats like” (Cormier 2002).

Along with their cosmological importance, monkeys also hold significance as pets and, more specifically, as adopted children for women. Orphaned monkeys enter the Guajá kinship system when hunters have killed their mothers. They are often given names, breast-fed, and otherwise treated as child-kin of the humans. Unlike hunted monkeys, these monkeys are not eaten. The primate-kin can also play a role in the ways in which humans represent themselves to one another: nursing an infant monkey can be desirable for women as it enhances both their appearance of fertility and attractiveness. In this way, monkeys play a role in the Guajá gender system and social development for females through both elevating social status and providing an opportunity to practice caring for a child (Cormier 2002).

Taking these perceptions into consideration when thinking about conservation strategies is beneficial for conservation scientists, local communities, and other primate species alike. Without such an understanding, non-Gujá humans may interpret Guajá cultural practices as destructive toward monkeys, giving them a fundamental misunderstanding of the relationships between Guajá and other primates. Such a misunderstanding could then risk damaging important cultural norms

and practices. If primatological research takes local human perceptions of other primates seriously, we are better able to reconcile the differing desires that various human groups hold.

Ethnoprimateological research from both the Lindu highlands and Buton island of Sulawesi shows that despite a relationship fraught with competition for resources, humans can be generally tolerant of crop raiding macaques (*Macaca ochreata* and *M. tonkeana*). Riley and Priston (2010) note that this tolerance is due to the place that macaques hold in some human folklore. Sulawesi, like many contemporary landscapes, is transforming due to logging, transmigration, cash cropping, and increasing human population, which has increased the overlap and interactions of human and macaque populations. As Riley and Priston (2010) note, crop raiding in Sulawesi is not a new phenomenon: it has been present since before Dutch colonization. Recent human activities have, however, exacerbated the problem (Riley and Priston 2010). While relationships between humans and crop raiding macaques may seem purely negative, some farmers are tolerant of low levels of raiding because it can help in the harvesting of certain crops. This tolerance is exemplified with cashew nut crops on Buton. Farmers perceive raiding as beneficial because monkeys eat only the fruit and let the nut fall to the ground to be collected by farmers (Riley and Priston 2010).

Crop raiding is not the only way humans and macaques interact in Sulawesi, macaques also hold mythological importance. Amongst some peoples, like the Muslim Butonese, macaques are considered haram (forbidden), deterring humans from killing and/or eating them (Riley and Priston 2010). For other native Sulawesi groups, macaques are more strongly connected to humans through ancestry. The Kajang tribe believes that their ancestors became monkeys. Similarly, in the Lindu highlands, the Kaili Tado (To Lindu) people see Tonkean macaques (*Macaca tonkeana*) as kin and as guardians of traditional law (adat) (Riley and Priston 2010). Because of their biological similarities to humans, they are understood to be of human origin. The To Lindu people thus understand that they should not behave in negative ways toward, or speak negatively of, the macaques, lest they wish the monkeys to become their enemies (Riley and Priston 2010). While this case provides a different understanding of the human–other primate interface from the Guajá example, it demonstrates that examining certain interactions and relationships is beneficial for developing conservation programs, as local perceptions can provide insights as to why and how certain relationships exist.

A particularly interesting case of human–other primate kinships is that of the Japanese and macaques. Filled with contradictions, the relationships between the two have shifted greatly over time and reflect the complexities of coexisting with other primates. Mito and Sprague (2012) outline the history of human–macaque interactions in Japan, beginning with the role of monkeys in prehistoric and early historic era art and subsistence. A significant shift in perception of monkeys was brought about by the arrival of Buddhism, which brought with it a respect for all animals and a discouragement from hunting and eating them. In the Middle Ages, humans began to train monkeys for the saru-mawashi monkey performances. Around the same time, the Umaya-zaru custom, in which samurai kept their pet

monkeys in stables to take on the diseases and misfortunes of horses, also appeared, as did crop raiding. By the nineteenth century, the hunting of wild animals increased. As a result, some went extinct and others, like monkeys, were hunted as both pests and commodities. In recent decades, increased crop damage has resulted in increased hunting of monkeys as pests (Mito and Sprague 2012). Although monkeys are still seen as pests by many, they have maintained their traditional role in Japanese cultural practices and thus their role as important cultural actors (e.g., as central figures in traditional children's stories) (Mito and Sprague 2012). Moreover, the Japanese people still believe that all things animate, and even objects such as stones and water, have a spirit and a personality. This aspect adds an interesting layer to the complexities and contradictions that characterize the relationships between the Japanese and macaques (Ohnuki-Tierney 1987).

Recently, monkey parks were introduced in an attempt to bring monkeys and people together. These parks encourage positive relationships by allowing humans to interact with the monkeys through food provisioning, while increasing tourism and the recovery of monkey populations (Mito and Sprague 2012). Monkey parks have been quite successful in Japan, but Mito and Sprague stress that despite their effectiveness in this context, such a solution will not work everywhere. Conservation strategies should not be developed in a "one size fits all" manner. Rather, "the actual solution to wildlife issues needs to be formulated with the cultural context of each place where humans and primates coexist" (Mito and Sprague 2012: 49).

As stated by Mito and Sprague (2012), there is no single answer for creating positive coexistence between humans and other primates. However, their case study, and those of Cormier (2002) and Riley and Priston (2010) show that understanding the context and details of particular human–other primate relationships can help significantly in trying to find solutions for conservation. From shared personhood to shared histories, considering these contexts can have great implications for conservation.

Long-Term Field Sites: Necessary for Developing Robust Knowledge Base

Long-term field sites are salient to the ethnoprimate framework because they allow for a broader understanding of the local and global contexts that influence foci of ongoing research projects. Such studies are well suited to reveal diverse social, economic, and ecological relations between human and other animal species. Researchers involved in long-term research projects are in the best position to identify and understand the interdependencies tying together human and other animals. It is important to note, however, that long-term field sites themselves also have an impact on the local social, political, and ecological landscapes. We illustrate these themes and outcomes via four brief examples of multi-year ethnoprimate projects.

Melissa Remis and colleagues have conducted research at the Dzanga Sangha Dense Forest Reserve in the Central African Republic (CAR) for nearly 15 years, enabling the substantive accumulation of diverse datasets (e.g., Remis and Jost-Robinson 2012, Chap. 3, this volume). For instance, Remis and Robinson conducted line transect surveys along the same paths across different years, allowing them to assess trends in ecological change between years for a specific transect. They found that there were less overall primate species along a single transect in 2009 than in 2002, and they also noted a decrease in the overall number of times the most common species were sighted between these years. Another form of data collection at their site includes multiple years' worth of interviews with local hunters. Working with hunters can be especially informative because they have a more intimate knowledge of the nearby primate populations, as well as the local flora and fauna in general, than those who are not engaged with forest-dwelling primates. Learning about specific hunting practices, such as the scale of killing and preferred targets (e.g., males), can further contextualize ecological data on shifts in the composition of local primate populations. Local community members, including those who engage in hunting practices, are more accessible and provide more reliable information at long-term field sites in which the researchers have established rapport with local residents. Ethnographic data collection in general is an integral facet of long-term ethnoprimateological studies because it acknowledges the importance of local human perception and behavior in relation to the broader socioecological niche to which other primates belong. Both of these methodological techniques are able to assess aspects of forest-use, impact, and change diachronically, with further reference to variables such as protected area demarcations and local primate home ranges. Combining ethnographic and survey/census methods in long-term contexts enabled this project to document ethnographic shifts in relation to ecological shifts, as well as contextualize primate behavioral data within the dynamic socioecological niche. One example of these shifting relations is the development of cryptic behaviors in some primate prey species to alleviate hunting pressure, which results in hunters modifying their own strategies to acquire prey by employing firearms (Remis and Jost-Robinson 2012). These authors conclude, however, that the primate anti-hunting strategies may not be able to keep up with such technological modifications to human hunting techniques.

The Padangtegal temple in Bali has been the focus of ethnoprimateological research for nearly the past 20 years (Wheatley 1999; Fuentes 2011; Brotcone 2014). The "field site" is open to all interested researchers, but much of the work has been conducted or overseen by Agustín Fuentes and an interdisciplinary team of colleagues. Padangtegal is an important site for understanding how long-term collaborations between researchers and locals can be employed effectively. Fuentes and colleagues (2007) provide a historical sketch of Padangtegal's development as a managed ecotourism destination, dating back to the 1980s. One conclusion emerging from comparisons of similar types of management systems is that such management programs must be flexibly conceived to account for the political-economic, ecological, and cultural dynamism of the human–other primate interface.

Research on other primates in folklore and mythology has been another important focus at Padangtegal. Researchers believed temple monkeys to be sacred early-on (cf. Wheatley 1999), but later work by Fuentes and colleagues (2005, 2007) demonstrated that perceptions of macaque monkeys at Padangtegal are rooted in more complex spatial, social, and economic interconnections (see also Schillaci et al. 2010). Interesting parallels exist between local Balinese people, such as tour guides, and long tailed macaques (*Macaca fascicularis*) in the socioecological niche of Hindu temples, including the mutual reliance on daily tourist income and food, respectively. As temple macaque populations increase, however, management strategies need to take into account the greater potential for conflict between people and macaques in these shared spaces and how that might affect local human perceptions of the macaques (Fuentes 2010).

Padangtegal has also been a valuable site for research focussed on understanding zoonotic pathogen transmission. For example, Engel and colleagues (2006) studied the transmission of Simian Foamy Virus between macaques and temple employees at this location (and subsequently across Asia: Jones-Engel et al. 2008). Fuentes (2006) situates such transmission in the context of human–macaque behavioral interactions that result in both species sharing this socioecological niche. Further, Lane and colleagues (2010) demonstrate that adverse health effects resulting from zoonotic transmission are bidirectional, meaning that members of both species can experience negative health impacts resulting from interactions in this shared space.

Macaque behavior at temple sites in Bali, such as Padangtegal, has also been monitored over time. In her recently published dissertation, Fany Brotcorne (2014) demonstrates more behavioral flexibility among macaques at Padangtegal than at other temple sites in Bali. She argues that this behavioral difference stems from the higher anthropogenically influenced diet for Padangtegal monkeys relative to others. More direct human provisioning at Padangtegal allows for behavioral plasticity to emerge in the context of non-subsistence behaviors (Brotcorne 2014).

Multi-year research projects in other areas of Indonesia have made important contributions to the ethnoprimateology literature as well. In Central Sulawesi, Riley (2007) found that overlapping resource use between humans and macaques does not necessarily result in conflict between them. For example, strategic planting of unappealing buffer crops near the forest edge can reduce the possibility of such conflict. Furthermore, taboos on hunting or disturbing monkeys in some societies, such as the To Lindu in Central Sulawesi, can prevent threats to monkey populations via retributive hunting for crop raiding (Riley 2007). Such taboos, however, do not offer long-term stability due to the dynamic nature of cultural institutions, as well as the presence of people moving in from other areas who do not share the local taboos on hunting monkeys (Riley 2007).

Stemming from work conducted with silvery gibbons (*Hylobates moloch*) in Java, Malone and colleagues (2014) describe the importance of long-term fieldwork for conservation projects. These authors suggest that the scientific focus of conservation research must be considered in reference to its local political implications. Ethnoprimateological work in particular, with its emphasis on ethnographic data collection among local people in tandem with primate behavioral and ecological data

collection, is in a good position to enlighten conservation projects regarding the local cultural and political issues that need to be addressed for the successful conservation of any given primate species (Malone et al. 2014). For example, rehabilitation and reintroduction programs, such as those proposed for silvery gibbons, stand to benefit from research in the ethnoprimatological framework as it is important to understand how local residents feel about the release of rehabilitated primates into nearby forests, and how these perceptions impact the long-term viability of such projects (Malone et al. 2014).

Politics: Unavoidable Realities of Fieldwork

An emerging focus of ethnoprimatological research brings political issues to the forefront. Just as the other primates can no longer be considered free from human influence, primatologists can no longer consider themselves separate from the sociopolitical circumstances of the regions in which they work. Such sociopolitical contexts can involve both local interpersonal conflict as well as tensions between the national and local levels. Furthermore, socioeconomic inequality and uncertainty are often pervasive in the regions that have been identified as conservation priorities.

Alejandro Estrada (2013) describes primate conservation projects as social issues that are necessarily connected to the local and global socioeconomic contexts of the area. Forested regions targeted for conservation, for instance, are often utilized by local people for subsistence and survival. In fact, “nearly 60 % of the world’s poorest people inhabit fragile, vulnerable tropical landscapes” (Estrada 2013: 34). Therefore, primate conservation programs must recognize that they are often enmeshed in the socioeconomic realities of massive poverty, economic instability, and political oppression. In terms of policy, this means that the implementation of top-down projects alone, such as the establishment of new protected areas, will not be sufficient and may actually be unethical in the context of human rights. Researchers must address primate habitat conservation with complementary approaches, including shifting away from monocropping and increasing the use of agroecosystems, utilizing shade crops, establishing biodiversity conservation corridors, and initiating community-based conservation management programs (Estrada 2013).

In their chapter on the ethics of conservation, Matthew McLennan and Catherine Hill (2013) tease apart the relationship between chimpanzees, local people, conservation scientists, and national governments. Echoing Estrada (2013), they describe a paradox in which chimpanzees are granted legal protection by the Ugandan government, but that same government rarely supports the local people in conflict with chimpanzees (McLennan and Hill 2013). For example, government regulations on locals’ land-use practices may be perceived as prioritizing chimpanzee livelihood by restricting human access to forest resources. The presence of Western scientists, who are often implicitly associated with the

national government (and typically work under the auspices of governmental permits), may therefore cause concern among locals when their land-use practices are not in line with government regulations (McLennan and Hill 2013). Local people may also worry that conservation scientists conducting research in their region indicate impending changes to land-use regulations, such as the implementation of new protected areas or other loss of local autonomy in land use decisions. Researchers themselves may inadvertently be associated with existing political conflict at the local level regarding discourses on conservation initiatives. For instance, McLennan reports that Ugandans with whom he worked assumed that he was involved with an unpopular proposed ecotourism plan due to his association with a specific community member who was behind it (McLennan and Hill 2013).

McLennan and Hill (2013) also shed light on the embedded politics of acquiring research permits from the national to the local level. Often seen as a means of establishing informed consent for conducting a research project in a foreign country, the top-down nature of the permit process situates researchers as government-sanctioned workers by the time they arrive at their proposed field site with the signatures of high-ranking government officials in-hand. Therefore, local people are often powerless to speak up and deny foreign scientists permission to conduct research in and around their communities (McLennan and Hill 2013). They also note that this situation can create a perceived power imbalance between locals and researchers: foreign scientists (typically white, coming into an impoverished area) are often perceived to have money and status and relatively powerless locals may feel obligated to assist (McLennan and Hill 2013). While it is usually not the intention of the researcher to create power imbalances, they may become an inevitable result of field studies. Hiring locals to work as field assistants, a common way of building a more reciprocal relationship with local communities, also has inherent political issues. Employing only a select few individuals can cause issues of jealousy and resentment in the community and may interfere with previous or existing instances of interpersonal conflict amongst locals (Fuentes 2002; McLennan and Hill 2013). All of these scenarios demonstrate that one cannot simply be a “neutral outside researcher,” but is rather always involved to some degree in local sociopolitical issues.

The commoditization of other primates is another political issue of importance for the ethnoprimateological framework. Agustín Fuentes (2013) discusses how macaques can be social as well as economic and subsistence commodities. In Japan, monkey performances are seen as related to important aspects of lived human experience and existence, which reflects the high degree of social inclusion for macaques in Japanese society (Fuentes 2013). As such, the role of these performing macaques can be characterized “as a social commodity, for the Japanese, while simultaneously acting as financial commodity for the monkey trainers” (Fuentes 2013: 112, see also Ohnuki-Tierney 1987, 1995). The other primates can also be commoditized as political symbols, as seen in the conflict between Spain and England over the isthmus of Gibraltar. The story of a nineteenth century Spanish attack thwarted by the alarm calls of startled macaques has become a common trope invoking a “naturalness” for

British control of the island (Fuentes 2013). The macaques of Gibraltar are also cultural commodities for local residents because they are the only free-ranging other primates in Europe (Fuentes 2013).

Through tourism, macaques are economic commodities in Gibraltar, as well as in parts of South Asia, Southeast Asia, and East Asia. In Bali, for example, monkey temples have greater numbers of tourists and generate more income than similar temples without resident monkey troops or than those with monkeys but a less developed tourist infrastructure (Fuentes et al. 2005). In other parts of Asia macaques are used as “laborers” similar to traction animals, such as oxen. Macaques in Thailand are a common example of this: they are trained from a young age to pick coconuts, which they do far more efficiently than humans (Sponsel et al. 2002). In Southeast Asia an array of primate species are also occasionally kept as “status” pets to demonstrate the owners’ high socioeconomic status. In these circumstances the primates are not necessarily economic commodities themselves, but are symbolic of their owners’ economic means (Fuentes 2013). Finally, many primates, and macaques in particular, are used as biomedical commodities in certain countries where such use is legal. Biomedical commodification of the other primates can occur from the local to transnational level, at which point the animals have become economic commodities as well. Understanding the role of primates as commodities in certain sociopolitical contexts sheds light on the social and economic value humans attribute to them, and the corresponding ways in which such interspecies relations are mediated by those perceptions of value (Fuentes 2013).

Multi-Stakeholder Approaches: The Reality of Complex Management Attempts

The most effective conservation strategies take into account the multiple actors that exist in and utilize an environment. Conservation programs that only focus on one actor, such as the target animal of the conservation program, are at risk of disempowering other groups, such as local people (Estrada 2013). Further, the most successful strategies weave together different disciplinary approaches to conservation such as understanding local wildlife, local perceptions of other life forms, and habitat protection in order to address the role that each group holds in the local ecology (Hockings and McLennan 2012). Many environments in need of conservation are characterized by the deeply intertwined relationships of different stakeholders, all of whom should be considered if a program is to be successful (Malone et al. 2014). Multi-stakeholder approaches to conservation are critical in areas where different groups use the same resources and ethnoprimateological work allows researchers to understand whether these various groups are aligned or at odds with one another over the uses of wildlife and the environment.

At their long-term field site in the CAR, Rebecca Hardin and Melissa Remis have identified changing patterns of human and other primate interactions and ways of existing (Hardin and Remis 2006). Due to an increase in overall human activity in the area and a proliferation of market-driven logging and hunting, interactions between humans and other primates are increasingly unsustainable as humans utilize more area and animal populations decline. In this context, economic developers, conservationists, and local humans focusing on bushmeat all interface with the wildlife, each with differing interests. This is, however, not always the case, different groups may align in their interest, as evidenced when researchers employ locals as field assistants or when locals participate in the global economy through employment in eco-tourism and conservation projects. In the CAR for instance, locals participate in these programs as guards or guides in gorilla eco-tourism and visits to sites where animals come together to bathe and socialize (Malone et al. 2014).

Remis and Hardin's (2009) concept of transvaluation is important for engaging with a multi-stakeholder approach because such a framework demonstrates the many roles that a single species can play in conservation and resource management. Further, transvaluation "helps to mobilize diverse stakeholders and provide new methods for monitoring forests—[they] emphasize the need for nuanced, site-specific approaches that recognize uniqueness of individual situations" (Malone et al. 2014: 18). This approach acknowledges that species such as gorillas have a local, regional, and global value. Further, it ensures that programs not only incorporate the different stakeholders, but can also help researchers, conservationists, and policy workers move beyond tired dichotomies of ethical versus material value of wildlife and landscapes (Malone et al. 2014) and instead understand the nuances of what it means to implement conservation programs in an area of deeply entangled relationships. Such entangled relationships provide the basis for what scholars call "situated collaborations," or processes of connecting "anthropological data and perspectives to conservation dilemmas" (Remis and Hardin 2009: 1589). Ethnoprimatology is in a privileged position for such collaborations because it allows researchers to understand both the perspectives—local, regional, and global—of other animals as well as wildlife behavioral data.

As mentioned previously, Kimberley Hockings and Matthew McLennan note that the most effective conservation strategies include multiple perspectives and various disciplinary approaches. Their research, which focuses on chimpanzees and crop-raiding activity across Africa, aimed to find effective conservation strategies from a multi-stakeholder approach (Hockings and McLennan 2012). They note that an increase in globalization has led to an increase of cash cropping. A combination of chimpanzee habitat loss and an increase of cash cropping has led to crop-raiding on the part of chimpanzees, a major source of conflict between humans and chimpanzees, and one that is not specific to just chimpanzees (see Riley 2007; McLennan and Priston 2013). Farmers often come to resent chimpanzees and fear for their safety (due to chimpanzee attacks,

a result of increased contact), which sometimes leads to the killing of chimpanzees (McLennan and Hill 2013). Crop-raiding animals pose a threat to both people and their livelihoods, but as habitat destruction continues, chimpanzees and other primates need a source of subsistence. Effective solutions to this problem include collecting ethnographic data in order to understand the local context of why cash cropping is problematic for both local humans and wildlife, as well as behavioral data to understand patterns of crop raiding. Examined together, such information can be used to create positive, sustainable solutions for all parties involved.

In northern Peru, Sam and Noga Shanee run a conservation Non-Government Organization (NGO) that emphasizes local people as keystone stakeholders in the conservation process (Shanee et al. 2014). Believing that effective conservation programs happen from within local groups, they encourage a bottom-up model rather than a top-down one. The departments of San Martín and Amazonas in which Shanee et al. conduct research have some of the highest rates of deforestation in Peru. Migrants in Peru are frequently blamed for environmental destruction and are described in the literature as maladaptive, antipathetic toward the forest, and hungry for land and natural resources. Shanee et al. (2014) found these characterizations to be prevalent in the environmental discourse of northeast Peru. Such destruction is, however, largely due to economic and legal pressures on migrants and such characterizations are not accurate. Rather than apathy toward nature, migrants do not always have the resources for conservation due to state requirements and a lack of sustainable options. Understanding these pressures, and the ways that migrants actually perceive the environment, as well as encouraging locals to take on conservation initiatives on their own terms, is hugely beneficial for the sustained success of programs (Shanee et al. 2014, see also Chaps. 12 and 18 this volume).

Alongside government-protected areas, Peru allows private conservation areas and conservation concessions. However, these private areas are difficult to acquire due to a complicated, costly, and time-consuming process of registration (Shanee et al. 2014). As a result, many migrant communities opt to bypass such processes and instead initiate informal conservation plans. Shanee and colleagues conclude that conservation effectiveness depends on partnerships with local stakeholders; as conservationists, we should encourage local people to initiate their own programs and work to simplify the process for establishing private protected areas. Rather than primarily encouraging locals to enter into the global economy, we should focus on local initiatives. Increasingly, the (Peruvian) government is valuing conservation, not for the wellbeing of animals and the environment, but for economic development. It is thus crucial that locals become involved and create their own protected areas in order to promote conservation that will benefit multiple stakeholders, including the local people themselves (Shanee et al. 2014). Ethnoprimateology can aid in this process by acknowledging the various stakeholders and legitimizing the value that each group places on various primate species.

Education: The Emergence of the Central Feature in Effective Conservation and Management

A key assumption underlying many conservation projects is that educating locals of the merits of protecting a particular primate species and their habitat will increase the project's likelihood of success (cf., Remis and Hardin 2009). As such, conservation projects with a focus on education are often concerned with expanding local knowledge of a primate species' important role in the shared ecosystem. More consideration, however, should be given to educating local stakeholders as to how conservation programs benefit them as well. Relying on arguments for the "good of the ecosystem" may not translate easily to the social, political, and economic realities that are embedded in local stakeholders' daily lives. In light of this perspective, conservation efforts should move away from attempts at infusing ecological knowledge locally and focus instead on the sharing and mutual transmission of ideas.

Nancy Priston and Simon Underdown (2009) have undertaken a novel conservation-oriented project that emphasizes establishing a body of shared knowledge with locals. They focussed specifically on helping farmers who deal with crop-raiding, assess the amount of crop damage incurred by primates compared to the damage done by other animal species, as well as the potential for damage to particular crop species in the future (Priston and Underdown 2009). Measurements of actual crop damage and crop-specific risk are important because the perception that crop damage is caused by primates influences peoples' opinions of, and behavior toward, those species (Priston and Underdown 2009). Damage caused by the other primates can be overestimated due to their conspicuous appearance relative to other crop-raiding animals, such as forest rats (see Riley 2007). Therefore, educating farmers as to the actual level of crop damage caused by primates can help alleviate conflict where they are not as destructive as perceived. To do so, Priston and Underdown (2009) established a simple model that farmers can use to calculate the actual risk or susceptibility of specific crops to damage from other primates. The necessary calculations are based on the incidence rate (IR) of damage across farms for a specific crop species, divided by the sum of the available, but damaged, and available, undamaged crops (Priston and Underdown 2009). Such calculations can then be made for all crop species to determine those that have the highest risk of being damaged (Priston and Underdown 2009). Planting strategies can then be made to alleviate susceptibility of damage for those crops with the highest risk. For example, farmers can organize their crops in specific spatial patterns by placing those species with greater risk of being damaged farther from the forest edge (Priston and Underdown 2009). This strategy has the added effect of creating a buffer zone of low-risk crops near the forest that are less likely to draw crop-raiding primates into the gardens. Transparent use of this model allows farmers to continue making calculations and monitoring damage risk across seasons, thereby insuring that they are not reliant on outside researchers to understand the most important risk factors to their crops over time (Priston and Underdown 2009).

The work of Melissa Remis and Rebecca Hardin represents the shift from conservation education to a dialectical relationship between researchers and local communities that we described above—and couched in an ethnoprimateological approach. Remis, a biological anthropologist, and Hardin, a cultural anthropologist, have combined efforts since 1997 in order to gain a robust understanding of human–other primate interactions at Dzanga-Ndoki Park and Dzanga-Sangha Dense Forest Reserve (RDS) in the CAR. Central to disseminating conservation information within a dialectical framework is the concept of “transvaluation,” which accounts for the comprehensive and multi-directional flow of resources (Remis and Hardin 2009). The complexity of transvaluation at sites of interest for conservation is necessarily reflective of the needs associated with the multiple stakeholders. Such “situated collaborations” are important because they contextualize the varied ways in which different actors (e.g., residents, tourists, researchers) value the habitat and wildlife (Remis and Hardin 2009). The information that emerges at each site on how multiple stakeholders interact with the local ecology can then be used to educate debates on conservation and land-use policy (Remis and Hardin 2009).

Another important dimension of conservation education from within a transvaluation framework comes from parents and other community members educating their children about the local ecology (Hardin and Remis 2006). When children accompany their parents into the forest for various activities, such as gathering food or medicinal plants and participating in hunting rituals, the local ecology becomes normalized and children learn about the flora and fauna in a hands-on, experiential fashion (Hardin and Remis 2006). Conservation programs should be cognizant of such situated education practices, especially when those programs limit who has access to the forest they are attempting to protect. For example, in some places a conservation strategy in which multi-generational camps of locals are no longer allowed within protected areas is being employed (cf., Hardin and Remis 2006). These policies disrupt the transmission of culturally situated ecological information between parents and children as described above, but also prevent nighttime song and dance performances that are powerful forms of storytelling directed at younger members of the community (Hardin and Remis 2006). Although such exclusive policies may be well-meaning, they also run the risk of disrupting the ways in which local people engage with, and transmit knowledge of, their surrounding ecology (Hardin and Remis 2006).

Finally, Shanee and colleagues (2014) describe salient forms of conservation education that operate at different levels among a location’s multiple stakeholders. For example, NGOs can be important for educating local communities about national policies and the bureaucratic processes regarding the development and implementation of conservation programs (Shanee et al. 2014). They can also be key sources of funding for such programs, but those resources may be limited by the organization’s ability to follow up long-term (Shanee et al. 2014). Another important level of conservation education occurs between local communities. Referred to as the “contagion effect,” inter-community education results from knowledge of successful, locally administered conservation programs spreading throughout the

region (Shanee et al. 2014). The contagion effect is a powerful force for conservation because it does not rely on the presence of NGOs or researchers to succeed, but is instead grounded in local practice. Furthermore, communities that begin administering conservation projects in this way will benefit by virtue of the transmitted practices having already been proven successful.

Conservation Management: Ethnoprimateology and the Role of Researchers as Active Agents in Local Ecologies

Gone are the days that primatologists can consider themselves merely observers: onlookers who have no influence on their surroundings, be they related to the environment, local human and other primate populations, or conservation and management efforts. The interconnectedness of humans and other primates extends beyond those relationships we study as scholars and includes the unintended consequences we create as researchers (McLennan and Hill 2013; Tsing 2004). Although socio-cultural anthropologists realized this in the 1980s, primatologists have only recently come to terms with the fact that there is no “noninvasive” research, all research has repercussions and primatologists are becoming increasingly aware of their ethical, moral, and social entanglements (Malone et al. 2014; Strier 2010). Much, although not all, of the primatological research done today is conducted in areas that are of increasing interest for conservationists. What eventually becomes apparent to researchers, but is not always obvious to others, is the intense interconnectedness of multiple stakeholders that surround conservation work, making it difficult to determine a single trajectory for successful conservation. In this section, we explore the unintended consequences and researcher influence related to conducting field research and their connection to conservation and management efforts.

Karen Strier’s (2010) work with the critically endangered northern muriqui (*Brachyteles hypoxanthus*) in Brazil—which began in 1983—provides a critical reflexive moment in primatology. After 30 years of a strict “hands-off policy,” Strier was able to examine the extent to which her work was truly noninvasive. From the beginning of the study, she has been committed to the notion of noninvasive observational research, meaning no direct handling, capturing, or sedating the monkeys. Although this presents a trade-off (types and contexts of data collection are significantly limited by such an approach), Strier felt it was the best for the fragile population of muriquis. But was it truly noninvasive? What she found was that despite her and her collaborators’ efforts, the research process did alter the future of the group and the unintended consequences of her research have effects regarding conservation.

Her study population and the environment they inhabit underwent noticeable changes over the 30-year period as a result of her research team’s presence: most notably an increase in population size and an altered niche (Strier 2010). The muriqui population has grown to four times its initial size, potentially a positive

element for the muriqui, but likely to have contributed to the decline in sympatric brown howler monkeys (*Alouatta guariba*). Moreover, the muriquis became less wary of observers and came into increasingly closer proximity to the human researchers. Finally, as a result of declining available space in relation to an increasing population, of habituation to humans, or a bit of both, there has been a 20-fold increase in the frequency of terrestrial use over a 22-year period. The monkeys have changed their behavioral niche from a mostly arboreal lifestyle to a mixed terrestrial/arboreal one and they now face new ecological parameters including pathogen exposure due to contact with feces and terrestrial predators (Strier 2010).

As active participants at field sites, researchers not only influence the other primate populations under study, we also impact both the humans who coexist with other primates and the environments in which our research takes place. Like Strier, McLennan and Hill (2013) make note of the unintended consequence of conducting field research and stress researcher influence, which should become a normal consideration in (ethno)primatological research.

McLennan's research with chimpanzees in western Uganda is a part of a larger project focusing on human–other animal relationships within commercialized rural production systems, land use change, and habitat destruction, all underpinned by conservation efforts for chimpanzees (McLennan and Hill 2013). The goal was to understand how chimpanzees, a protected animal under Ugandan law, respond and adapt to changes and fragmentation of unprotected habitat and increased contact with humans. This contact is often detrimental for humans either through crop-raiding or direct attack on humans. An important outcome of the study however is an examination of the ethical implications regarding humans and the effects outside researchers have on local human populations. These include: influences of the arrival of primatologists on social processes and political dynamics and the changing social relations resulting from locally employed field assistance, the top-down process by which researchers gain clearance in Uganda, resulting in power relationships between researchers and local people, the distinction between research and conservation and the complicated decision of when to act, and the issue of whether impoverished rural communities should be expected to live with and conserve both-ersome and sometimes dangerous wildlife (McLennan and Hill 2013).

Primatologists may also find themselves stuck between fealties to the research objectives versus intervening in issues of conservation. Should we remain passive observers in the face of environmental destruction and species loss or are we ethically obligated to take action? One might also consider this: is it our place, despite our ethics and good intentions, to interject in matters we may not fully understand? How might stepping in have positive effects for animals and their environments but negative ones for humans? The most pressing issue facing a field researcher is this: is it worth it (Malone et al. 2010; McLennan and Hill 2013)? Further, who are we to say, as foreigners who do not live alongside potentially dangerous animals who threaten our livelihoods, that these creatures (chimpanzees in this case) carry the worth that we give them (McLennan and Hill 2013). Why is it that our classification as an important conservation target is more important than protecting the

impoverished people inextricably intertwined with other primates? McLennan asks if it is indeed appropriate to conserve chimpanzees in such circumstances. While the circumstances he mentions are particular to his site, the question can and should be applied to all ethnoprimateological research sites.

The long-term research by Remis and Hardin (2007) in the CAR embodies the goals of ethnoprimateology while grappling with issues of conservation. Over many years, they have documented changing forest uses and how this interfaces with changing human perceptions of and relations with other primates. Specifically, they have looked at the ways that traditional forest uses such as hunting and gathering have been replaced by new ways of interacting with the landscape, which include logging and conservation (Remis and Hardin 2006). Their collaborative research provides insights into changing human uses and perceptions of the forest, variations in human and other animal adaptations to habitat alterations, and decreases in animal densities at research sites. Comparing findings from this study to that of their respective long-term research in the area reveals that humans are “both materially and ideationally impoverished by animal declines” (Remis and Hardin 2006, 273).

Combined methods from biological and cultural anthropology such as transect work and ethnography provide a lens for understanding an increase in gorilla predation and the connection to increased economic activity, human immigration in the RDS region, and social changes that may cause local declines of prey populations that are alternative options to gorillas (Remis and Hardin 2006). This work also complicates simplistic understandings of conservation and management work in areas with multiple stakeholders. As the authors note, the increasingly politically charged nature of conservation work has taken on an “us” versus “them” rhetoric, conservation is often understood as either counter to indigenous people’s interests or connected to colonial discourses of understanding and controlling the natural world (Remis and Hardin 2006). Moreover, conservation can be interpreted as favoring one group’s interests over others, such as protecting animals from human encroachment or protecting forest-dwelling humans against conservationists and other actors (Remis and Hardin 2006). Entangled interest in forest resources is far more complex than the simple “save the rainforest” ideology prevalent in many conservation ideologies. Ethnoprimateology and the work by Remis and Hardin help to elucidate these complexities because we can gain insight from multiple parties that will help us to understand the many different perceptions of other primates.

Looking Forward: Interlacing Ethnoprimateological Practice and Conservation Management

Humans are central figures in every context and ecology in which other primates are studied. Therefore, we recommend that the following foci be addressed in future primatological research.

- Primatological projects should collaborate with ethnographic projects in the same area to better understand both the important perspectives of local people and the roles of other primates in local people's lives.
- Researchers should take seriously the political ecology of the multi-stakeholder approach and further, primatologists should make themselves aware of the political, economic, and social contexts of the area *before* beginning research.
- Following Strier, primatologists need to consider the continuing impact of short and long-term field sites, as well as conservation programs, on local communities and ecologies.
- Along with considering different stakeholders, we must also look at the multiple problems that can interfere with the sustainability of ecological systems. Rather than having primatologists focus solely on conservation, we can work to create sustainable systems that address a range of different stakeholders' needs.
- Finally, long-term and broad-scale primatological research projects should be multidisciplinary in order to address the issues and examples outlined throughout this chapter.

References

- Brotcone, F. (2014) *Behavioral ecology of commensal long-tailed Macaque (Macaca fascicularis) Populations in Bali, Indonesia*. PhD dissertation, Department of Biology, Ecology and Evolution, University of Liege.
- Cormier, L. A. (2002). Monkey as food, monkey as child: Guaja symbolic cannibalism. In A. Fuentes & L. D. Wolfe (Eds.), *Primates face-to-face: The conservation implications of human-nonhuman primate interconnections* (pp. 63–84). Cambridge, England: Cambridge University Press.
- Engel, G., Hungerford, L. L., Jones-Engel, L., Travis, D., Eberle, R., Fuentes, A., et al. (2006). Risk assessment: A model for predicting cross-species transmission of simian foamy virus from macaques (*M. fascicularis*) to humans at a monkey temple in Bali, Indonesia. *American Journal of Primatology*, 68, 934–948.
- Estrada, A. (2013). Socioeconomic contexts of primate conservation: Population, poverty, global economic demands, and sustainable land use. *American Journal of Primatology*, 75, 30–45.
- Fuentes, A. (2006). Human culture and monkey behavior: Assessing the contexts of potential pathogen transmission between Macaques and Humans. *American Journal of Primatology*, 8, 880–896.
- Fuentes, A. (2010). Nature cultural encounters in Bali: Monkeys, temples, tourists, and ethnoprimateology. *Cultural Anthropology*, 25(4), 600–624.
- Fuentes, A. (2011). Being human and doing primatology: National, socioeconomic, and ethnic influences on primatological practice. *American Journal of Primatology*, 73(3), 233–237.
- Fuentes, A. (2012). Ethnoprimatology and the anthropology of the human-primate interface. *Annual Review of Anthropology*, 41, 101–117.
- Fuentes, A. (2002) Monkeys, Humans, and Politics in the Mentawai islands: No Simple Solutions in a Complex World In A. Fuentes and L. D. Wolfe (Eds). *Primates Face to Face: The Conservation Implications of Human and Nonhuman Primate Interconnections*. Cambridge University Press pp. 187–207.
- Fuentes, A. (2013). Pets, property, and partners: Macaques as commodities in the human-other primate interface. In S. Radhakrishna et al. (Eds.), *The macaque connection: Cooperation and*

- conflict between humans and macaques, developments in primatology: Progress and prospects*. New York: Springer.
- Fuentes, A., & Hockings, K. (2010). The ethnoprimateological approach in primatology. *American Journal of Primatology*, 72, 841–847.
- Fuentes, A., Shaw, E., & Cortes, J. (2007). A qualitative assessment of macaque tourist sites in Padangtegal, Bali, Indonesia, and the Upper Rock Nature Reserve, Gibraltar. *International Journal of Primatology*, 28, 1143–1158.
- Fuentes, A., Southern, M., & Suaryana, K. G. (2005). Monkey forests and human landscapes: Is extensive sympatry sustainable for *Homo sapiens* and *Macaca fascicularis* in Bali? In J. D. Paterson & J. Wallis (Eds.), *Commensalism and conflict: The human-primate interface* (pp. 168–195). San Antonio, TX: American Society of Primatologists.
- Hardin, R., & Remis, M. J. (2006). Biological and cultural anthropology of a changing tropical forest: A fruitful collaboration across subfields. *American Anthropologist*, 108(2), 273–285.
- Hockings, K. J., & McLennan, M. R. (2012). From forest to farm: Systematic review of cultivar feeding by chimpanzees—Management implications for wildlife in anthropogenic landscapes. *PLoS One*, 7(4), e33391.
- Jones-Engel, L., May, C. C., Engel, G. A., Steinkraus, K. A., Schillaci, M. A., Fuentes, A., et al. (2008). Diverse contexts of zoonotic transmission of simian foamy viruses in Asia. *Emerging Infectious Diseases*, 14(8), 1200–1208.
- Kohn, E. (2013). *How forests think: Toward an anthropology beyond the human*. Berkeley, CA: University of California Press.
- Lane, K. E., Lute, M., Rompis, A., Wandia, I. N., Arta Putra, I. G. A., Hollocher, H., et al. (2010). Pests, pestilence, and people: The long-tailed macaque and its role in the cultural complexities of Bali. In S. Gursky & J. Supriatna (Eds.), *Indonesian primates (development in primatology: Progress and prospects)* (pp. 235–248). New York: Springer.
- Lee, P. C. (2010). Sharing space: Can ethnoprimateology contribute to the survival of nonhuman primates in human-dominated globalized landscapes? *American Journal of Primatology*, 72, 925–931.
- Loudon, J. E., Howells, M. E., & Fuentes, A. (2006). The importance of integrative anthropology: A preliminary investigation employing primatological and cultural anthropological data collection methods in assessing human-monkey co-existence in Bali, Indonesia. *Ecological and Environmental Anthropology*, 2(1), 2–13.
- Malone, N., Wade, A. H., Fuentes, A., Riley, E. P., Remis, M. J., & Jost-Robinson, C. (2014). Ethnoprimateology: Critical interdisciplinarity and multispecies approaches in anthropology. *Critique of Anthropology*, 34(1), 8–29.
- Malone, N., Fuentes, A., & White, F. (2010) Subjects of Knowledge and Control in Field Primatology *American Journal of Primatology*, 72:779–784.
- McLennan, M. R., & Hill, C. (2013). Ethical issues in the study and conservation of an African great ape in an unprotected, human-dominated landscape in western Uganda. In J. MacClancy & A. Fuentes (Eds.), *Ethics in the field: Contemporary challenges* (pp. 42–66). Oxford, England: Berghahn.
- McLennan, M. R., & Priston, N. E. C. (2013). Managing humans, managing macaques: Human—macaque conflict in Asia and Africa. In S. Radhakrishna, M. A. Huffman, & A. Sinha (Eds.), *The Macaque connection: Cooperation and conflict between humans and macaques* (Progress and prospects, Vol. 43, pp. 225–250). New York: Springer.
- Mito, Y., & Sprague, D. S. (2012). The Japanese and Japanese monkeys: Dissonant neighbors seeking accommodation in a shared habitat. In S. Radhakrishna, M. A. Huffman, & A. Sinha (Eds.), *The macaque connection: Cooperation and conflict between humans and macaques, developments in primatology* (Progress and prospects, Vol. 43, pp. 33–51). New York: Springer.
- Ohnuki-Tierney, E. (1987). *The monkey as mirror: Symbolic transformations in Japanese history and ritual*. Princeton, NJ: Princeton University Press.
- Ohnuki-Tierney, E. (1995). Representations of the monkey (Saru) in Japanese culture. In R. Corby & B. Theunissen (Eds.), *Evaluative proceedings of the symposium ape, man, apeman: Changing views since 1600* (pp. 297–308). Leiden, the Netherlands: Leiden University.

- Priston, N. E. C., & Underdown, S. (2009). A simple method for calculating the likelihood of crop damage by primates an epidemiological approach. *International Journal of Pest Management*, 55(1), 51–56.
- Remis, M. J., & Hardin, R. (2007). Anthropological contributions to protected area management. In Transforming Parks and Protected Areas: Policy and Governance in a Changing World, (eds) KS Hanna, DA Clark, DS Slocombe, pp. 85–109. London: Rutledge.
- Remis, M. J., & Hardin, R. (2009). Transvalued species in an African forest. *Conservation Biology*, 23(6), 1588–1596.
- Remis, M. J., & Jost-Robinson, C. A. (2012). Reductions in primate abundance and diversity in a multiuse protected area: Synergistic impacts of hunting and logging in a Congo Basin forest. *American Journal of Primatology*, 74, 602–612.
- Riley, E. P. (2007). The human–macaque interface: Conservation implications of current and future overlap and conflict in Lore Lindu National park, Sulawesi, Indonesia. *American Anthropologist*, 109, 473–484.
- Riley, E. P. (2010). The importance of human-macaque folklore for conservation in Lore Lindu National Park, Sulawesi, Indonesia. *Oryx*, 44(2), 235–240.
- Riley, E. P., Fuentes A., & Wolfe, L. (2011). Ethnoprimatology: contextualizing human and nonhuman primate interactions. In: Primates in Perspective. 2nd edition, C. Campbell, A. Fuentes, K. MacKinnon, S. K. Bearder and R. Stumpf (eds.), pp.676–686. Oxford University Press, Oxford.
- Riley, E. P., & Priston, N. E. C. (2010). Macaques in farms and folklore: Exploring the human-nonhuman primate interface in Sulawesi, Indonesia. *American Journal of Primatology*, 72, 848–854.
- Schillaci, M. A., Engel, G. A., Fuentes, A., Rompis, A., Putra, A., Wandia, I. N., et al. (2010). The not-so-sacred monkeys of Bali: A radiographic study of human-primate commensalism. In S. Gursky & J. Supriatna (Eds.), *Indonesian primates (Development in primatology: Progress and prospects)* (pp. 249–256). New York: Springer.
- Shanee, N., Shanee, S., & Horwich, R. H. (2014). Effectiveness of locally run conservation initiatives in north-east Peru. *Oryx*, 49(2), 239–247. doi:10.1017/S0030605313001002.
- Sponsel, L. E., Ruttanadukul, N., & Natadecha-Sponsel, P. (2002). Monkey business? The conservation implications of macaque ethnoprimatology in Southern Thailand. In A. Fuentes & L. D. Wolfe (Eds.), *Primates face-to-face: The conservation implications of human-nonhuman primate interconnections* (pp. 288–309). Cambridge, England: Cambridge University Press.
- Strier, K. B. (2010). Long-term field studies: Positive impacts and unintended consequences. *American Journal of Primatology*, 72, 772–778.
- Tsing, A. L. (2004). *Friction: An ethnography of global connection*. Princeton, NJ: Princeton University Press.
- Wheatley, B. (1999). *The sacred monkeys of Bali*. Prospect Heights, IL: Waveland Press.