Cadê o mico? Where is the tamarin?: Locating monkeys in the politics of land and conservation in Rio de Janeiro, Brazil

Analía Villagra

Graduate Center, City University of New York

How does access to this work benefit you? Let us know!

Follow this and additional works at: http://academicworks.cuny.edu/gc_etds

Part of the Anthropology Commons, and the Latin American Studies Commons

Recommended Citation

Villagra, Analía, "Cadê o mico? Where is the tamarin?: Locating monkeys in the politics of land and conservation in Rio de Janeiro, Brazil" (2014). CUNY Academic Works.
http://academicworks.cuny.edu/gc_etds/310

This Dissertation is brought to you by CUNY Academic Works. It has been accepted for inclusion in All Graduate Works by Year: Dissertations, Theses, and Capstone Projects by an authorized administrator of CUNY Academic Works. For more information, please contact deposit@gc.cuny.edu.
Cadê o mico? Where is the tamarin?: Locating monkeys in the politics of land and conservation in Rio de Janeiro, Brazil

by

Analfá Villagra

A dissertation submitted to the Graduate Faculty in Anthropology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2014
This manuscript has been read and accepted for the Graduate Faculty in Anthropology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

John Collins

___________________________________________

Date Chair of Examining Committee

Gerald Creed

___________________________________________

Date Executive Officer

Murphy Halliburton

Louise Lennihan

Paige West

Supervisory Committee

THE CITY UNIVERSITY OF NEW YORK
Abstract

Cadê o mico? Where is the tamarin?: Locating monkeys in the politics of land and conservation in Rio de Janeiro, Brazil

by

Analía Villagra

Advisor: John Collins

The golden lion tamarin is a small, endangered monkey found in only a few municipalities in the state of Rio de Janeiro, Brazil. This dissertation explores the project to conserve this rare primate, a project that links together agrarian reform, forest restoration, agroforestry, and conservation biology. Informed by Brazil’s social and political history, and drawing from 12 months of fieldwork conducted in 2008 and 2010, this dissertation argues that by looking carefully at and for the tamarin, we discover the interrelated political, social, and animal relationships that weave together to produce conservation in southeastern Brazil.
For Mom, Papi, and Erin,

who have always been unfailingly enthusiastic about my academic pursuits even when I myself had doubts.
Acknowledgements

The members of my committee have all been immensely influential throughout my graduate school experience, even before they were part of the committee. Murphy Halliburton’s “Science and the Politics of Knowledge” class in my first semester at the Graduate Center shaped my approach to anthropology and introduced me to an exciting literature on science and animal studies that, I can say without exaggeration, changed everything. As both department chair and the leader of a dissertation development seminar, Louise Lennihan watched my project develop from the start and provided important suggestions that have helped me think about my work as part of a broad and global field. Paige West first inspired me through her fantastic ethnography and later was kind enough to let me take her “Culture and Consumption” seminar at Columbia. Last but not least, my advisor, John Collins. Each and every meeting with John yielded voluminous notes, insights, and new literature to explore (equal parts daunting and exciting). Without his insightful feedback and patience through my occasionally frenzied e-mails and phone calls I cannot imagine what this dissertation would look like.

I was incredibly fortunate to be the recipient of a Dissertation Proposal Development Fellowship from the Social Science Research Council. My thanks to Janet Browne and Harriet Ritvo for organizing the Animal Studies DPDF group and to my fellow participants, especially Shari Wilcox, for her boundless energy and passion. As our interdisciplinary group mulled the overlaps between human and animal worlds, Shari, with strength and humor, reminded us to take our work seriously, but not ourselves (too much). A student travel stipend from the Graduate Center at CUNY also helped me visit Brazil and get the lay of the land in Casimiro. The bulk of my fieldwork was supported by grants from the Wenner-Gren Foundation, the National Science Foundation Science, Technology, and Society section, and the Fulbright Commission.

In Brazil, Marcus Pedlowski at Universidade Estadual do Norte Fluminense supported my visa and introduced me to important regional literature. There are not enough words to thank the staff and collaborators of the Golden Lion Tamarin Association (AMLD), some who are still there and others who
have moved on to other projects. Throughout this dissertations I have used pseudonyms, but my thanks to: Denise Rambaldi, Maria Inês, Gabriel, Carlos Ruiz-Miranda, Carlos Alvarenga, Nino, Patricia Mie, Gustavo, Juliano, Aline, Nandia, Thiago, Andréia Martins, Junior, Nelson, and the whole reintroduction team. I was also fortunate to meet and talk with Louann Dietz, an American conservation educator and founder of Save the Lion Tamarin, the U.S.-based NGO that supports the AMLD’s work in Brazil. Cristiane Benevenuto and Anselmo Nazare at CEDRO were unfailingly generous with their time and friendship. With them I visited numerous small agricultural communities in the area. Residents of these communities, both *assentados* and *acampados*, were also very open and willing to share their experiences with me. Special thanks to Dona Denise, Elsemiro, Gilda and Gilberto (oh to have had the skill to match wits with you two!), Bigode, Gaucho, and Dona Alice (you will be missed). With Cristiane I was able to spend long hours talking not just about work but about life, and I will forever admire her strength and spirit. It is hard to return from the field and leave such good friends behind. Finally, Claudioneia Muller da Silva and her family opened their home to me and were my “family away from family” while I was in Brazil. Funny, frank, and compassionate, Neia taught me about life in Casimiro, and made me feel that I truly had a part in it.

Back in New York, Ellen DeRiso, the Anthropology Department APO-of-wonder, keeps the department sane and organized. I can’t imagine where any of us would be without her. I will never forget the welcoming cup of coffee I had with Melissa Zavala and José Vasquez as I stumbled, wide-eyed, out of my very first class at the Graduate Center. Melissa has continued to be an incredible correspondent, and took time away from her own writing to provide me with detailed and remarkably insightful comments on a draft of this dissertation. Without her feedback the draft would have stagnated at “almost done” for much longer before throwing itself over the finish line. Professor Alfred Rosenberger at Brooklyn College was kind enough to read chapters 3 and 5, offering me the invaluable perspective of a primatologist.

I am grateful to my grandfather, Duane Fitzgerald, for reading a draft of the last chapter and providing comments that helped me finish it. My thanks to Katy for her helpful insights into approaching
travel alone and far from home, and to Erin who, since we were eleven years old, has countered my wariness with enthusiasm. My family has always been my rock: Raquel, who has grown from baby sister to closest confidante and whose wonderful correspondence made me feel less lonely while I was in the field; Nick’s thirst for adventure and experience has inspired and challenged my timid inclinations; Ben has never failed to meet my occasionally melodramatic or wild worry with calming practicality; and, of course, my parents, Linda and José. Among their infinite parental talents, they have so resolutely believed in our abilities, encouraged and supported our interests, that I will always owe them an incalculable debt for whatever accomplishments I may stumble upon in life. Finally, my husband Aaron. He was a damn good sport when I spent most of our first year of marriage on a different continent and when I finally dragged him on his first trip out of the country to spend time in sleepy Casimiro de Abreu, where little children pointed and stared at his novel American-ness. He has remained unfailingly patient as I have worked through the both arduous and exciting process of writing this dissertation.
Table of Contents

<table>
<thead>
<tr>
<th>Prologue</th>
<th>Places unknown: Locating conservation on a map</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1</td>
<td>Finding our way</td>
<td>11</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>Forest restoration: Chasing equilibrium, perfecting nature</td>
<td>34</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>Tamarins</td>
<td>65</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>Agriculture in the politics of land and conservation</td>
<td>96</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>Locating tamarins in the forest (or, cadê of mico?)</td>
<td>129</td>
</tr>
<tr>
<td>Conclusion</td>
<td>Too close for comfort</td>
<td>149</td>
</tr>
<tr>
<td>Appendix A</td>
<td>Acronyms and terms</td>
<td>172</td>
</tr>
<tr>
<td>Appendix B</td>
<td>The banana letter</td>
<td>173</td>
</tr>
<tr>
<td>Bibliography</td>
<td></td>
<td>174</td>
</tr>
</tbody>
</table>
**List of Figures**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Original and actual distribution of the golden lion tamarin</td>
<td>1</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Looking at the map</td>
<td>3</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Casimiro, statue in front of the <em>Casa de Cultura</em></td>
<td>13</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Boulder by the forest trail</td>
<td>25</td>
</tr>
<tr>
<td>Figure 5</td>
<td>The <em>morro</em> (hill)</td>
<td>44</td>
</tr>
<tr>
<td>Figure 6</td>
<td><em>Capim</em> (grass)</td>
<td>54</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Standing at the top of a steep hill to be reforested</td>
<td>56</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Plastic sacks for <em>mudas</em> (seedlings)</td>
<td>58</td>
</tr>
<tr>
<td>Figure 9</td>
<td>The golden lion tamarin</td>
<td>66</td>
</tr>
<tr>
<td>Figure 10</td>
<td>Reforestation project</td>
<td>70</td>
</tr>
<tr>
<td>Figure 11</td>
<td>Lion tamarin distribution</td>
<td>74</td>
</tr>
<tr>
<td>Figure 12</td>
<td>The doorway</td>
<td>83</td>
</tr>
<tr>
<td>Figure 13</td>
<td>Metapopulation map</td>
<td>87</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Community workshop</td>
<td>107</td>
</tr>
<tr>
<td>Figure 15</td>
<td>Ready for planting</td>
<td>117</td>
</tr>
<tr>
<td>Figure 16</td>
<td>The Serra Mar region delegation</td>
<td>122</td>
</tr>
<tr>
<td>Figure 17</td>
<td>Corn cake</td>
<td>123</td>
</tr>
<tr>
<td>Figure 18</td>
<td>On the road to Autaz-Mirim</td>
<td>126</td>
</tr>
<tr>
<td>Figure 19</td>
<td>Out with the antenna</td>
<td>130</td>
</tr>
<tr>
<td>Figure 20</td>
<td>Getting closer</td>
<td>130</td>
</tr>
<tr>
<td>Figure 21</td>
<td>Setting the traps</td>
<td>140</td>
</tr>
<tr>
<td>Figure 22</td>
<td>Taking measurements</td>
<td>141</td>
</tr>
<tr>
<td>Figure 22</td>
<td>Public phone booth decorated with tamarin</td>
<td>142</td>
</tr>
</tbody>
</table>
Figure 1. Original and actual distribution of the golden lion tamarin. (Former tamarin range in light green inset, current range in dark green. Map from the AMLD)
PROLOGUE, Places unknown: Locating conservation on a map

A group of staff from the União biological reserve in the municipality of Casimiro de Abreu in northeastern Rio de Janeiro state had called a meeting at the community center of Carangola, an agrarian reform settlement of just over eighty families adjacent to the reserve. They came to the community in order to discuss a proposed expansion of the reserve. União is one of two major protected areas founded largely to conserve the golden lion tamarin (*Leontopithecus rosalia*), a squirrel sized orange monkey found in just a few municipalities of this one state in Brazil. The proposed expansion would increase the size of the reserve from 2,500 hectares to 4,400 hectares, a 175% increase, by appropriating forested fragments of land that surround the existing reserve.

This region of Brazil is part of the Atlantic Forest habitat range and, per the federal forest code of 1965, 20% of every property must be left untouched to allow the proliferation of the native habitat (in this case, Atlantic Forest).1 Many of the fragments that União would absorb were already *reserva legal* (legal reserve, RL), legally protected forest that technically remains the property of the landowners. While owners cannot remove trees from these RL areas, they are allowed to engage in limited activities including gathering seeds, collecting fallen branches for firewood, and engaging in environmental tourism (tours or hiking, for example). A *reserva biológica* (biological reserve or Rebio) such as União, on the other hand, is completely inaccessible except with special scientific or educational permits. Under the expansion plan, the reserve would take official control of RL forested areas, making them part of the Rebio, though presumably releasing the landowners from the 20% requirement in the process. In this town hall phase of the project, the local reserve employees as well as representatives from *Instituto*
Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute for the Environment and Natural Renewable Resources, IBAMA) were holding a series of meetings to explain and justify the project to the affected landholders, field questions, and perhaps accept small adjustments to the terms of the land acquisition.

Some of the appropriated land would come from large plantations, but some would come from this small farming community, where individual plots average 15-50 hectares. To begin the presentation, the tall, thin IBAMA representative from Brasília and the shorter, rounder director of the reserve attempted to clarify the physical bounds of the project, which had been much debated through casual hearsay conversations within the community. Will all of the settlement be affected? What exactly will the reserve take away? The uneasy speculation amongst the community residents had gone so far as to suggest that IBAMA will take over the entire settlement.

The presenters began by projecting a large satellite map in front of the crowd. They intended to point out which areas were under consideration in this plan, but they were stymied by their inability to locate the community on the map. They played a game of pin the tail on the donkey, wildly and boldly planting their fingers on a few spots that ended up being on the opposite end of the map from Carangola.
Satellite maps are essential to navigating this rural municipality. Once you turn off of the BR-101 highway into Carangola, the asphalt is quickly replaced by dirt road. As is typical of small farming communities in the region, Carangola has only dirt roads of varying quality. After a heavy rain a number of sections of the settlement become completely inaccessible, and the lack of infrastructure makes school, medical attention, and markets for agricultural products sporadically unavailable. There is no way, as an outsider, to find many of the settlements here without a satellite image and an ability to differentiate between the faint winding of a stream and the faint winding of a back road. Assuming a road exists at all.

More than once I marveled at the ease with which some of my acquaintances in the field read properties, roads, rivers, and forest density from the splotches of color of these sorts of satellite images. Though the government employees who came to deliver this presentation struck me as capable, well-educated, and articulate people, their ignorance of their current location teetered somewhere between the disturbing and the absurd. Why couldn’t they find this piece of land where they stood? How could they be the shepherds of a forest ecosystem that they literally could not locate?

Finding Nature

The idea that “nature” exists in opposition to something called “culture” or “civilization” is rooted in the Judeo-Christian tradition of man as shepherd of nature. Adventurers and travel writers of the 19th century like Alexander von Humboldt “reinvented South America first and foremost as nature” (Pratt 1992:120) and produced a literature informed by Enlightenment philosophy and marked by “the erasure of the human […] a landscape imbued with social fantasies – of harmony, industry, liberty, unalienated joie de vivre – all projected onto the non-
human world” (Pratt 1992:125). This landscape was mysterious, wild, and sometimes dangerous (Hecht and Cockburn 1991; Slater 2003; Stepan 2006). Dangerous, in any case, to the European visitor who faced the threat of untamed forest and savage local peoples, both represented as part of the natural world.

European explorers viewed the New World as “untouched,” despite the widespread and long lasting presence of native peoples in the Americas (Denevan 1992). This construction of “pure” nature persists into the present; forest preserves like Poço das Antas and União protect forests not even a century old without differentiating between older and newer growth, ancient forest (of which there is little) and recently reforested land. The celebration of nature comes at the expense of admitting human influence. Often, “it is not enough to physically remove human agency and occupation from the landscape, they must be purged from history completely” (Neumann 1998:19) because of a persistent view that only that which is outside of the human is truly natural and thus a candidate for preservation (Ereshefsky 2007). The impossibility of such simple, clean logic compels Bruce Braun to ask, “in what ways might the defense of nature, and not only its exploitation, be complicit in forms of erasure and abjection?” (Braun 2002:2).

Nations work to create national parks and biological preserves in response to growing global concern about the state of the environment, but as they work, “the idea that conservation is a palliative to extractive activities in the rain forest has only shrouded the contributions of subaltern workers who have prepared the grounds for Westerners' romanticization, exploitation, discovery, and salvation of tropical wilderness” (Sodikoff 2012:Highlight Loc. 300-301). The arrival of new human actors – conservationists, biologists, tourists – erases local peoples and histories. Conservation denies some human pasts and relationships with nature in favor of others.
In Carangola, the IBAMA representative talked about Brazil’s commitment to the world, “Brazil has pledged to save 10% of each of the biomes of this country,” he said. This bold gesture that the country had made on behalf of the natural environment clearly impressed him, and he tried to convince us to appreciate it similarly. I was wont to agree with him. It is hard to resist the optimistic promise of this tropical country rising to the top of the global scene and brandishing the righteous sword of wildlife conservation. But how can one measure the practical impact of conservation if one cannot so much as locate it outside of the conceptual maps and ethical imperatives of our minds? Where are we on the map? The maps under discussion in Carangola show the highways and other official roads, but no map reveals the individual property lines within the settlement, nor the small roads that weave through the community. The place represented by these maps does not reflect the “on-the-ground” reality lived by the people of the community.

The men from the reserve possessed some map reading skills. Forested segments of a number of much larger properties that surround the community made up a substantial portion of the lands affected by the expansion. As they attempted to orient themselves on the 2-D projected space, the men pointed out large private properties by name, Fazenda X or Sítio Y. The behavior of the casually disoriented government employees speaks to a national social history in which the nearly one hundred poor families settled on this land are, quite basically, not worth finding.

**Social realities in the shadow of a biological reserve**

If the reserve representatives were unsure of exactly where they were, the community was equally confused as to the origin of the government employees. The reserve is adjacent to the community, but the people attending the meeting constantly asked the União representatives
if they came from Poço das Antas, a reserve 15 kilometers in the other direction. It seems both neighbors had been insensible to one another. The people of Carangola knew about Poço das Antas in neighboring Silva Jardim because the Associação Mico-Leão-Dourado (Golden Lion Tamarin Association, AMLD) is based there, and the employees of the association have, for decades, actively engaged with small farmers and agrarian reform communities in the region as part of their broad efforts to make the region hospitable for the little native monkeys. I will return to the AMLD shortly as it is not only a presence in local agriculture but also the major player in tamarin conservation.

The expansion of the União reserve had just two really practical impacts for Carangola. First, the increased proximity of the reserve means more fiscalização (law enforcement) in the area. The presence of outsiders in the community does not generally lead to an increase in positive attention or advocacy for the community. Rather, more government employees looking in is more likely to lead to more trouble for the residents. Outsiders tend not to demand more municipal services or social justice for the community; they notice infractions, the slight grammatical errors in the letter of the law. In addition to illegal activities that people knowingly engage in, such as burning fields, selling their land, or clearing forest, the community also felt trepidation about the possibility of myriad accidental infractions. Brazilian environmental laws, as well as the laws governing agrarian reform, are convoluted and dense. The fear that a government official would stumble upon an infraction that a farmer did not even know he was committing was not a far-fetched idea. Even government officials do not know all of the laws; the assurances of the men running the meeting that everything will be fine ring a little hollow.

In the previous year, employees of the municipal Department of Agriculture launched an initiative in Carangola to help people build commercial fish tanks. Unbeknownst to the
municipal employees, such tanks cannot be built closer than 30 meters to a stream and must have special filters to assure that the non-native tilapia (the most commonly raised fish) do not escape into the local ecosystem. The municipal employees oversaw the construction of tanks built too close to the natural water sources and without filters. So the Department of Agriculture employees returned the following year with the news that the community would have to make amends. The municipal government negotiated a deal with the federal government to reforest areas three times as large as the offending fish tank in order to recompense (and avoid a federal fine). To their dismay, the affected landholders learned that even more of their very small plots of land would have to be covered in untouchable, uncultivable, legally protected forest space. It was no wonder that no one looks relieved when the reserve employees assured them that the expansion would really not change much and would not inconvenience anyone.

Some members of the community at the meeting were acutely aware that things will change. The second practical impact of the expansion plan would affect only those whose property directly abuts the forest that will become government land. Seu Jovelino is a portly, pleasant man with an affable demeanor and a quick wit. The implications of the changes discussed at the meeting made him visibly nervous, and with due cause. For years he cultivated his land as an exquisite sistema agroflorestal (agroforestry system, SAF), growing his substantial and varied produce under the shade of native forest, planting native crops from seeds he gathered himself in the uncultivated woods on his property. He is the local paragon for ecologically responsible agriculture and as such was featured in a video produced by a local university for a state-wide conference on the agroecology movement. His trepidation of things to come visibly dampened his general good humor.
The visitors assured him that only uncultivated land will be appropriated. Though the satellite imagery does not mark the difference between forest and lush agroforestry system, the reserve employees made it clear that the latter would be safe. However, the neighboring forest was an important font of resources for Jovelino. He had established numerous pathways through the vegetation covering a circuit of labeled trees from which he gathered seeds. Without access to these routes he would no longer have the local plant varieties that are critical to his SAF. Once his legal reserve becomes part of União, it will become illegal for him to set foot in the forest.

After the official meeting adjourns and everyone bustles around as they pack up to go, the Brasília representative repeated that Jovelino’s SAF will be safe, while stalling about the second part of his problem, the routes through the forest that sustain his operation. Carol (an employee of a local agricultural assistance non-profit) and I looked on and privately agreed that he will likely lose access to the woods.

**Cadê o mico? Where is the tamarin?**

It is at this nebulous intersection between bureaucrat and farmer, man and nature, Brazil and the world that I locate my research. My dissertation is based on 12 months of fieldwork conducted in 2008 and 2010, 120 kilometers outside of the city of Rio de Janeiro in two neighboring municipalities, Silva Jardim and Casimiro de Abreu. The place is the center of one of conservation’s rare and incredible success stories. Here, just a toe off the beaten path, the golden lion tamarin, a tiny, bright orange primate found in no other place in the world, hovered on the brink of extinction in the late 1970s and then experienced an astounding resurgence thanks to an impassioned, well-coordinated rescue effort by Brazilian and American scientists, educators, and students. I originally conceived of the project as an exploration of the
relationship between human beings and our primate cousins as the two species negotiated the process of conservation in the Brazilian Atlantic Forest. *Cadê o mico?* (where is this monkey?) Where in the complex environmental law delineating varying layers of forest protection, where among the color coded population maps, where in the doctoral theses and political maneuverings, where in the detailed genetic records of the captive GLT population, where within the tamarin logo that brands Atlantic Forest conservation…where was the monkey itself? Where was it folded within three decades of talk and action aimed at saving it from its losing battle with human civilization?

Where indeed? I expected to unpack rigorously the way people talked about the monkey, to illuminate something profound about the relationship between researchers, educators, and local residence with this singular animal species. Yet when I arrived in Brazil in February 2010 for the bulk of my field research, it struck me how little the tamarin came up, even at the AMLD, the groundbreaking NGO that formed around the original efforts to rescue the species. Instead of explicit discussion of the tamarin, the talk was all about agrarian reform, forest restoration, family agriculture, agroforestry, things that I had given little or no thought as I contemplated the relationships between humans and primates and ways of seeing and representing non-human animals. The chapters that follow trace the tangled threads of political, social, and animal relationships that together comprise conservation in this region.
CHAPTER 1, Finding our way

When I burst from the canned cool air of the airport onto the sidewalk of Galeão airport in Rio de Janeiro, I squinted and sneezed as the thick, warm air curled around my nasal cilia. I dearly love the heat, but it would be a few days before my body accepted the transition from New York winter to Brazilian summer. Cradled in the hammock of heat, I drifted onto a bus bound for the city’s main bus station. The discomfort of my suitcase jammed awkwardly against my leg kept me alert for the 30 minute trek. I navigated the chaotic morass of the Rodoviário Novo Rio (bus station), elbowed my way onto the Casimiro de Abreu bound bus (assigned seating aside, there seemed to be a great collective urge to board expediently), and quickly nodded off. I fall asleep almost instantly on buses. This ability, generally convenient for budget travel, proved an impediment to my vision for the narrative of my fieldwork. Such a story should open with my arrival, my impressions of the changing landscape as I edged closer to my destination, but most of the time I felt as though I had been beamed into Casimiro.

By the time I flitted my eyes open, the dirty concrete and jostling human and vehicular traffic had vanished into thin air, replaced by gentle green hills, open skies, and wooden fences, posts poetically askew. On subsequent journeys to and from Casimiro, less worn out by international travel, I tried to focus and stay awake to watch the transition from urban landscape into rural countryside. When I finally managed to succeed in this endeavor, aided by the soft beeping of the alarm on my wristwatch, it was not so different from waking suddenly at my destination. Rio’s spectacular pandemonium faded into the dull roar of peripheral towns, but an hour or so out, like falling asleep and landing in Wonderland, the urban was gone, leaving just the bucolic country scene behind.
Casimiro de Abreu is located 120 kilometers from Rio de Janeiro. The municipality is part of the *baixada litorânea* (lowland coastal) region of the state that covers the coast north and east of Rio, including the popular beach vacation towns of Cabo Frio and Buzios. Casimiro maintains a sliver of access to the Atlantic Ocean to the southeast; the northwest edge of the municipality is hedged in by the *Serra do Mar* (literally, mountains of the sea). The entire municipality is home to 22,000 people, and of those, just over 18,000 are classified as “urban,” living in one of four towns: Casimiro de Abreu, Barra de São João, Professor Souza, or Rio Dourado (Visite Casimiro 2013). Casimiro de Abreu is the largest of these and the county seat.

In conversation, people use “Casimiro” without making a distinction between the town and the municipality (similar to the way New Yorkers talk about New York or Brazilians about Rio, rarely specifying city or state as one or the other is easily understood). Generally, references to history, geography, politics, or any other similarly broad theme refers to the municipality; if asked where they live, people will respond with the name of their town (Casimiro, Rio Dourado) or settlement (Carangola). The Casimiro of this narrative is the municipality and sometimes even places just outside the municipal boundaries.

In the Prologue, I introduced two men with good intentions completely, tragi-comically, lacking the small but critical ability to find themselves on a map. This opening chapter is meant to serve as a way-finding tool, a means of first establishing where this dissertation takes place, geographically and historically, offering an introductory exercise in considering the nature of the human relationship with animals, and finally establishing where, theoretically, I have come from.

---

**Casimiro de Abreu**

*Tem tantas belezas, tantas,*  
*A minha terra natal,*  
It has so many beauties, so many,  
My birthplace,
Que nem as sonha um poeta
E nem as canta um mortal!
- É uma terra de amores
Alcatifada de flores
Onde a brisa em seus rumores
Murmura: - não tem rival!
  - “Minha Terra,” Casimiro de Abreu (my translation)

Casimiro is named for the mid-19th century romantic poet Casimiro José Marques de Abreu, born in Barra de São João in 1839. He wrote with “tender innocence and an almost childlike sensibility […] perhaps with exaggerated sentimentality and filled with a love for nature” (Academia Brasileira de Letras 2013) and died of tuberculosis at age 21 at the Fazenda Indaiáçu, his mother’s property (FUNARJ 2013). The area is sometimes referred to as a terra da poeta (the land of the poet) and though I assume this means the birthplace of the man, I think it could also be understood as the land the man loved. The geographical Casimiro today is celebrated for its natural beauty, its undeniably poetic merging of mountains and sea, peppered in between with waterfalls, forest, and abundant diverse fauna. That a poet, maneuvering themes of nature’s beauty and nostalgia for innocent times past, emerged from this place seems almost an inevitability.

Figure 3. Casimiro, statue in front of the Casa de Cultura
**Historical beginnings**

As the story goes, in 1494, Pope Alexander VI drew a line down an unfinished map of the world beyond the Iberian Peninsula, and gave everything east of the line to Portugal and everything to the west to Spain, settling the ongoing debate between the two adventuring kingdoms as to who owned the New World. The Portuguese and the Spanish had seen very little of the lands divided between them by the Treaty of Tordesillas, and over the years that followed the two countries negotiated and renegotiated their claims as continued exploration illuminated more detail of the vast territory of the Americas. These early maps defined coastlines, mouths of rivers, and bays. Though what lay deeper inland remained more mysterious, the optimistic sovereigns politicked for the right to possess whatever they discovered within (presumably gold, spices, and infinite other riches, some of which they did find there and some of which they did not).

The region that would become Casimiro de Abreu is part of the Portuguese historical record from the beginning of their explorations of Brazil. A fleet commanded by Gaspar de Lemos arrived in Rio’s Guanabara Bay (which they believed to be the mouth of a large river) in January 1502. On their way to Rio from their first landing point in Porto Seguro, Bahia to the north, the Portuguese sailed down the coast and past the São João River, which originates in the Serra do Mar mountains in the interior of Rio de Janeiro state, runs through what is now Casimiro de Abreu, and empties into the Atlantic Ocean. The São João appears, with a variety of names, on very early Portuguese maps of the coast (Linhares 2009). King João III divided his new territory into fifteen segments, called capitâncias (captaincies) by drawing parallel lines extending from the coast straight in towards the interior. Each of these was given to a favored noble who would both bear responsibility for and reap the profits from their allotted turf.
Casimiro de Abreu and the surrounding land belonged to the Capitania de São Vicente though, like many territories in colonial Brazil, it traded hands between the Crown and other nobles.

Jesuits erected the São João Batista chapel in 1619 at the mouth of the São João River near an extinct volcano that received the same name, Morro São João. The town of Barra de São João grew up around the chapel. For the next 200 years, Barra was the most important settlement in the minimally populated region because of a single critical asset: a port. Though the port was small, it was accessible by small boats, and forest and agricultural products easily arrived from the interior via the river to be shipped south to Rio for export (Linhares 2009:59; Mattos de Castro 1988:467). Some sugar plantations existed at Rio’s border with Espírito Santo in the north, the noreste fluminense (northeastern Rio) region around Campos dos Goytacazes, but in Casimiro and the baixada litorânea most of the soil was not suited for cane (Dean 1995:178; Mattos de Castro 1985:466). The region did export hardwoods and contributed some of the copious amounts of firewood needed for sugar production that took place elsewhere (Oliveira 2007:16; see also Rogers 2010) as well as firewood for homes, which “comprised 80 percent or more of Brazilian energy consumption” (Dean 1985:64) well into the mid–20th century.

At the end of the 18th century, coffee was introduced to the region (Russell-Wood 1992:175), and from that point on it dominated the agriculture of the state of Rio de Janeiro and the country as a whole, overtaking sugar and gold. Coffee production also had an enormous impact on the forest environment, in the estimation of Warren Dean, “the introduction of this exotic was to pose a more intense threat than any other event of the previous 300 years” (Dean 1995:178). Brazilian planters, experimenting with coffee production without experience or instructive resources, cleared forest for coffee production with little scientific discrimination
(Stein 1985:31). Apparently lacking in knowledge of shade growing techniques employed in other coffee growing countries, Brazilian landowners applied the same slash-and-burn techniques to coffee growing that were employed in sugar cane production. Clear cutting and burning over the second half of the 19th century consumed the Atlantic Forest at an aggressive and alarming rate. Not only were coffee growing methods a threat to the ecosystem, but plantation owner routinely abandoned older coffee groves when their productivity waned and cleared new areas in order to keep up the pace of production (Dean 1995:181). New land and virgin soil were seen, at least by a certain class of wealthy planters, as infinite resources, and so, they eschewed crop rotation and fertilization in favor of monoculture planting until the fields failed to yield good crops (Dean 1995:194). They saw no problem with replacing older, less productive fields by deforesting new tracts of land. This pattern of abandonment of coffee groves that had declined in productivity also lead to the consolidation of land among family members to best take advantage of remaining productive groves and standing forest (Stein 1985:224). Major coffee production took place in the Paraíba River Valley between Rio de Janeiro and São Paulo where “the number of coffee trees had become the measure of a planter’s wealth” (Stein 1985:25). Smaller operations took root in the area around Casimiro de Abreu, which primarily exported coffee and manioc flour (Mattos de Castro 1988:467).

Not only did the growing of coffee lead directly to the large-scale destruction of Atlantic Forest habitat, Rio de Janeiro’s coffee boom was accompanied by a marked growth in population and the increased urbanization of the region (Dean 1995:191). The swelling population put pressure on the environment. The presence of more people, and the greater need for efficient transportation networks to bring coffee to market, resulted in infrastructure improvements which also made the forest more accessible to an increasing number of people. In 1852,
construction began on a railroad through the state. The line did not pass through the town of Barra de São João on the Atlantic coast. Instead, a station opened 20 kilometers inland in 1880 on the Fazenda Indaiáçu (Estações Ferrovias 2013). Indaiáçu became a town in 1890. The declining Barra and ascending Indaiáçu spent the first quarter of the 20th century vying for political control of the municipality. The construction of a railroad could seal the fate of a town by opening or closing off access to markets and intrastate travelers (Stein 1985:110). Indaiáçu replaced Barra as the sede (county seat) in 1901. Barra won its title back in 1904, but in 1925 Indaiáçu definitely took control of the municipality and it was renamed Casimiro de Abreu11 (Linhares 2009:89, 104). The BR-101, the longest highway in the country, extending 4,800 kilometers from Rio Grande do Sul in the south to Rio Grande do Norte in the north, opened in the region in the 1950s. The highway took a similar path through the municipality to that of the railroad. Although Casimiro itself is rarely a destination, it is the midway point between Rio de Janeiro and the petroleum center of Macaé to the north; it is also the point at which travelers from Rio can catch a bus up into the mountains to Sana, a town made popular by its beautiful waterfalls and hippie culture. Casimiro is not a well-known place, but with the tip of the town hugging the BR-101, and a bus station with space for a half dozen buses (in the unlikely event that so many should arrive at once), the town remains the county seat.

Anthropic pressure and threats to conservation

The BR-101, like the rail line that preceded it,12 creates a very particular conservation problem: the highway bifurcates the golden lion tamarin habitat range. Two of the seven major populations of tamarins, including those on the Poço das Antas biological reserve, are south of the highway. The remaining five populations, including União, are to the north. As the tamarin
population grows and individual animals seek out new territories and mates, tamarins are
sometimes struck by cars while trying to cross from one side of the highway to another. This has
started to become a serious concern for conservationists as the growth of the tamarin population
has led to an increase in highway fatalities. Every now and again someone will float the
impractical idea of creating some sort of tamarin footbridge over the road (one man helpfully
suggested lining it with bananas to encourage the monkeys to use it). Standing on the side of
the highway, watching the cars and trucks bolt back and forth and feeling the wind of their
terrifying speed, one senses the immensity of this anthropogenic barrier. The habitat of this
singular animal species is irreversibly divided. The conservation activities that I describe in the
subsequent chapters of this dissertation take place around and in spite of this serious, non-
negotiable, impediment to the dream of a contiguous tamarin habitat.

The BR-101 is a tangible threat, a solid concrete line drawing a definitive border between
tamarin territories. The highway is also a testament to the accessibility of the region and its high
level of development, both qualities which lead to increasing human pressure on the Atlantic
Forest habitat such as illegal logging, clearing for agriculture, and urban expansion. In this
section, I wish to introduce another threat to tamarins, one that is less important in terms of the
scale of the problem but easier to engage with in that it is a direct physical interaction between
man and tamarin, presenting an opportunity to consider the moral landscape of human-animal
relationships. This threat is hunting.

Hunting provides an interesting entrance into animal worlds, and it is historically very
closely linked to conservation. The hunter “wants the beasts he kills to be endlessly replaced so
that his sportive battle with the wilderness can go on indefinitely” (Cartmill 1993:31) and can
thus be one of the first members of a society to take an interest in the state of the natural world in
response to human pressure. As far back as the Ancient Greeks, the hunter “is a liminal and ambiguous figure” divided between the world of men and the natural world “because hunting takes place at the boundary between the human domain and the wilderness” (Cartmill 1993:31). Hunting is also an important part of a boy’s transition into manhood and an expression of cultural ideas about masculinity in many cultures, including in the contemporary southern United States (Marks 1991).

The interests of very particular kinds of hunters in the late 19th and early 20th century United States drove the development of conservation and scientific management as they exist today. The lasting influence of these ideas warrants a discussion of hunting in the U.S. and its link to an emerging environmental ethic. Concern about dwindling populations of deer, elk, and other game animals inspired concern for North American forests. The sudden paucity of these animals in the late 1800s threatened to deny a class of white men the cultural ritual of the sport hunt. In both symbol and reality, sport hunting at the turn of the century brought men into visceral contact with animals and with habitats that the hunters defined by the animal interactions and lifeways within them. In other words, a certain group of men understood the forest as, above all else, the realm of the game animal. Sport hunting symbolically returned these men, like Theodore Roosevelt and Ernest Hemingway, to their “natural” (perhaps predatory) origins, positioning them in their rightful place above the other animals. The sport hunter both dominates his quarry and imposes limitations on himself (he cannot kill a doe or a fawn, for example) that allow him to express his sense of the proper ethics of respectable masculinity. Gentlemen hunters did not tolerate other hunters who might kill animals deemed unacceptable, like songbirds (Warren 1997:28), or kill without regard for displaying “fair” or “manly” skill.
(Jacoby 2001:58). They were a major force behind the creation of the U.S. National Parks, wherein certain hunting privileges were preserved and others were criminalized.

In the view of Aldo Leopold, an early voice for environmental ethics in the U.S., “the only way to protect wildlife was to preserve free hunting, and the only way to protect free hunting was to preserve wildlife” (Warren 1997:80). Leopold felt that management of wildlife in the national parks and forests addressed this issue. Not all people agreed with this assessment. Conservation efforts in North America slowly stripped American Indian of rights to access their traditional hunting grounds. Settlers on the borders of what became national parks and forests accustomed to using forest resources, including timber and game, found their subsistence behaviors increasingly criminalized (Jacoby 2001). Possessed of more political clout than poor settlers, immigrants, and American Indians, sport hunters lobbied heavily to ensure that game laws outlawed subsistence hunting that did not express their “sporting ideals” (Warren 1997:14). For communities near the parks, “resistance to conservation therefore remained a defining feature of life” (Warren 1997:169) as game that often made all the difference in scrapping by through the winter was forbidden to them in favor of “limited hunting rights for middle-class recreational sportsmen” (Warren 1997:73). In other words, in the new, legally approved, game rules the acquisition of meat was not the primary purpose of hunting; “the commodity was no longer the deer, but the activity” (Warren 1997:58). Only a privileged few had access to legal hunting, and those privileged few reclassified subsistence hunters as poachers. The efforts of sport hunters crystallized ideas about how “pristine” lands ought to be protected and managed, ideas that continue to be relevant nationally and globally as foundations of conservation.

Though the concept of conservation itself owes its genesis in large measure to U.S. sport hunters, hunting in Brazil has a distinct character. There is no word for “poaching” in
Portuguese. There is caça (hunting) and caça ilegal (illegal hunting), however, as all hunting is illegal in Brazil, I never heard anyone bother with the understood “ilegal.” These linguistic and legal facts already set the scene for a very different conversation on hunting than might be found in areas like the U.S., where cultures of sport hunting suggest degrees of acceptability of various kinds of animal deaths and elicit questions of social structure and morality among the people who may, or may not, be allowed to hunt. In Brazil, only the state of Rio Grande do Sul issues sport hunting permits, and even there no licenses have been granted since 2005 (Fernandes-Ferreira et al. 2012:238).

No big game animals live in Casimiro. Typical victims of poaching here are tatu (6-12 pound members of the armadillo family), peccary, paca (a large rodent), tapete (a Brazilian rabbit), and capybara (Brito et al. 2004:225). Like so many illegal activities, the scale and impact of hunting is difficult to gauge, but it is a consistent problem. Hunters in Casimiro disturb habitat, light fires in the forest, and may also be involved in trapping animals for the illegal pet trade, all of which damage the overall ecosystem. However, unlike the other conservation issues I will discuss in more depth (agroforestry practices, creating forest reserves, reintroducing monkeys), hunting is not a gray area up for discussion in the local community. I do not mean to suggest that hunting in general is not a sticky moral terrain. As discussed above in the case of the U.S., hunting and poaching are deeply enmeshed in considerations of social and political inequality, global economics, and cultural traditions. However, that is not the case with hunting in the Casimiro region. Here there is no cultural tradition on par with sport hunting in the United States, nor are their indigenous peoples such as one might encounter in the Amazon region, whose traditional ways are in conflict with laws and conventions of conservation. Hunting is illegal and the penalties are steep.
Depending on whom you ask, in Casimiro hunting is engaged in by rich folk looking for sport or poor farmers looking for extra meat. In the case of the latter, though poverty exists here it is unlikely that anyone in this particular region is faced with the decision of poaching illegally or starving. Hunting, then, is both avoidable and unjustifiable. It is taboo enough (both because it is disapproved of and because of the strong government presence) that one would have to be very bold to defend it publicly, as opposed to other practices, like using fire to clear brush for planting, which spark impassioned debate despite universal understanding that it is illegal. Hunting, like fires and illegal logging, is serious in that it is criminal, but unlike fire or illegal logging, hunting is an environmental crime that involves direct engagement with animals and thus provides an interesting entry point for thinking about the relationship of humans and micos in Casimiro.

Hunting is an expression of a relationship, not a passive expression, but a meaty one. Hunting is a visceral relationship. Among wildlife managers in rural Pennsylvania, sociologist Helene Lawson observed, “officers rated animals according to the kind and level of enjoyment hunters got from killing them” (Lawson 2002:57). There is deep pleasure and satisfaction to be had from the ritualized process of stalking and killing an animal. Historically, a depth of emotion against hunting exists as well. As early as the 16th century, art, literature, and even hunting manuals decried the cruelty of man against the innocent, hunted animals, evoking the trope of a “sobbing deer” (Cartmill 1993:81). Physiologically, humans and other mammals have analogous responses to fear, which anthropologist Agustín Fuentes suggests supports an argument for “homologous personhood” (Fuentes 2006:126). Deer might not sob, but they do experience the same heightened sympathetic nervous system responses that people do in stressful
situations. The hunted animals are enough like the hunter evoke sympathy, or even respect and affection, for the quarry.

In terms of intimacy, hunters’ relationships to animals and habitats might be most closely related to those of scientists. Biologist E.O. Wilson describes mentally preparing himself to be in the field, “call it the naturalist’s trance, the hunter’s trance” (Wilson 1984:6) he says of the “zone” he enters. Wilson, of course, is “hunting” for invertebrates on the forest floor, but the point remains that hunters and scientists share a mindset, a particular closeness with nature. Unlike many other conservation challenges, hunting brings people and animals into intimate and emotional contact, suggestive of a long historical tradition of interspecies encounters and an even longer story of underlying biological affinity. Whether one argues for or against the hunt, hunting expresses a deeply emotional bond between humans and nonhumans and inspires a reflection on the “proper” relationship of man and other animals. Hunting in Brazil is so legally fraught that I was unwilling to pursue the topic during my time in the field. However, hunting emerged unavoidably in little moments that revealed compassion for nature, frustration with the authorities, and the intersections between hunting and conservation. These moments provide a multitude of entry points into the relationships between forest, animals, and the varied human populations around Casimiro de Abreu.

**Vignettes: Shades of Hunting**

The pitch black sky at 6:00 p.m. and the crisp coolness of the night air made the change of the season obvious. I sat with Helena, the cook and cleaning woman for the AMLD, on a wooden bench under the porch light at the front entrance of the office. Samuel stood on the tiled porch, just far enough from the light to be transformed into a shadowed outline of himself. He
took an unhurried drag on a cigarette and the pale smoke caught the light as it curled up towards the stars. A dog howled in the distance. “Someone is hunting,” he said. “Who?” Helena asked. He shrugged, “…The dogs. Hunters often use dogs…” He held the cigarette in his mouth and gestured with both hands to illustrate cutting off an escape. His mumbled explanation trailed off as we stopped to listen to another howl. He nodded knowingly, softly mimicking the particular inflection he knew to be that of the hunting dog. We heard no more howls and sat in silence.

~ ~ ~

Samuel and Alex, the two forest engineers at the AMLD, dove right into the woods. I saw no obvious trail, so our unceremonious plunge into the greenery surprised me. We had come to this section of forest so that they could check out the quality of the forest fragment and approximate its age (this process is described in more detail in chapter 2). We passed from an area of alternating six or seven foot *capim-colonial* (an invasive grass introduced for use as animal feed) and trees to a more solidly forested area. A little ways in we came across a trail. We followed the trail as it inclined upwards, and one large section was lined with a plant whose thick, glossy leaves looked conspicuously out of place to me. Alex confirmed that it was an African plant called *espada de São Jorge* (St. George’s sword), and it is used in *candomblé* (Afro-Brazilian religion) rituals for its *gún* (warm) energy and to ward off the evil eye.

We heard a deep gravely howl in the distance. By this time, I had spent enough time in the forest to recognize this racket as *bugios* (howler monkeys) and did not immediately imagine panther teeth shining from the dark shadows between the trees. Alex found a healthy bromeliad in the nook of a fallen branch and delicately tucked it into a new nook in a standing tree. Samuel moved a bit ahead of us to smoke. He called down to us; he thinks this is a hunter’s trail.
We continued. To our right loomed a huge rock, over which draped the root structure of a tree. It was impressive, like a 20 foot octopus in the middle of the woods. A minute up the trail we passed another two tree-wrapped boulders; a whole pod of octopuses camouflaged into the snaking greens and browns of the forest. As the trail curved around the second two boulders we saw a cleared area between them, the light gray ash of two camp fires, an empty pack of cigarettes, a box stuck between some branches. The trail ended. “You can tell that this is the hunters’ camp,” Samuel said, with his habitual gravity of tone that gave every observation an air of solemnity. The scene was impressive in both its natural beauty and the dark meaning of the clearing. The trail itself, lined with exotic species, and the camp it led to, provided weighty physical evidence of important conservation problems in the area. Alex and Samuel had gathered enough observations about the forest to approximate its age and health. We headed back.

![Boulder by the forest trail](image)

Figure 4. Boulder by the forest trail

~ ~ ~

One of the AMLD educators was supposed to give a short program at the cultural center in Casimiro on the problem of animal trafficking. While we waited for her to set up, the flamboyant man who worked at the center complained about the IBAMA employees who are
supposed to monitor environmental infractions. Protecting nature? He has seen them barbecuing
poached animals! The extravagance of his claim is equal parts exaggerated absurdity and all too
believable irony. This is not a region where malnourishment or starvation drives the otherwise
law-abiding citizen into the protected forests for meat; Rio de Janeiro state is a place of theatrics
and rebellious daring that smirks at the banalities of law.

Samuel told Helena that IBAMA caught some hunters on the reserve last night. They
will be sent to jail. “Surely not,” she protested, “they send criminals to jail, not hunters!” “They
are criminals,” Samuel persisted, “they broke federal law.” Helena shook her head in disbelief at
the notion of calling hunters “criminals” but seemed impressed with the severity of the situation.
She is so tender-hearted towards animals of all shapes and sizes that I could not imagine her
approving of hunting, nor of trespassing on the reserve, but her surprise seemed to suggest that
different categories for criminality exist, a different way of understanding crimes against the
environment as opposed to the crimes of society like stealing, murders, and drug trafficking. The
differentiated categories exist from the law enforcement side as well. Fires are a consistent and
serious threat to the Atlantic Forest habitat, but I heard little concerned talk of sending suspected
fire starters to jail. Hunting, though smaller in scale, is nonetheless severely regulated.

**Animals to conserve with (or, who/what are they?)**

Hunting is the most “primeval relationship between humans and the rest of the animal
kingdom” (Ritvo 2004:211). But, animals are far from simply passive victims of human
aggression. Anthropologist Paul Nadasdy observes among native peoples of North America that,
“hunting is more appropriately viewed as a long-term relationship of reciprocal exchange
between animals and the humans who hunt them” (Nadasdy 2007:25); animals “give themselves” to hunters who are then bound to animals in spiritual debt. Hunting is not an expression of the dominance of man over nature so much as one of a number of relationships between various types of persons (some of whom may be animal-persons). In contrast, anthropologist John Knight rejects the “hunting-as-sharing” view that “represents hunting as an intimate, mutualistic, and even non-violent relationship between hunter and hunted animal” (Knight 2012:334) because of the temporally limited interaction of the hunter with the individual animal, but he does acknowledge the relationship of the hunter to animal kind and his skillful interaction with the natural environment that, by necessity, must match (and eventually out-match) that of his quarry.

Human and animal worlds intersect on more planes than simply killing and eating. Certainly animal-as-food figures importantly in systems of classification (Tambiah 1969), but animals are also prominent in cosmological understandings of both human origins and human futures. Animals are viewed variously as mythical progenitors of mankind (Loudon et al. 2006), as kin (Cormier 2003; Franklin 2007; Haraway 1989), as degraded humans (Tambiah 1969:441) and as “occasional ‘cosmonautical’ companions” that help humans “engage with the beings that inhabit the world of the forest and beyond” (Kohn 2007:18; see also Viveiros de Castro 1996).

Far from being confined to these fascinating but limited cosmologies, animals are everywhere. They have inserted themselves into the realm of history, politics, ethnography, philosophy, sociology, and beyond (Emel and Wolch 1998; Kalof and Fitzgerald 2007; Kirksey and Helmreich 2010; Ritvo 2004). They have challenged not only the boundary between human and animal (Ritvo 1995) but also “boundaries and continuities” in the construction of distinct places in the world (Lien 2005). This discussion owes a great deal to Derrida, who “insists that
animals have the capacity to interrupt one’s existence and inaugurate ethical and political encounters” (Calarco 2008:106).

The multidisciplinary field of “Animal Studies” has exploded over the past few years. In anthropology, a volume of work exists centered on creatures who were formerly relegated to the footnotes and the background. The animal presence is potent enough for Kirksey and Helmreich to suggest the emergence of a “multispecies ethnography” (Kirksey and Helmreich 2010). In their article, they provide a comprehensive overview of the animal in anthropology, from Lewis Henry Morgan’s late 19th century work on the American beaver, to early 20th century classics on exchange and categorization of animals, to late 20th and early 21st century feminist critiques of biological kinship and new views of genetic identities and human taxonomy in studies of race. From this trajectory, they go on to elaborate on the contemporary scene in which anthropologists, newly interested in the lives of animals, unmask tangled and interconnected webs of people, animals, plants, fungi, and microbes. In their origin story of this movement, “an emergent cohort of ‘multispecies ethnographers’ began to place a fresh emphasis on the subjectivity and agency of organisms whose lives are entangled with humans” (Kirksey and Helmreich 2010:566).

Even in fields in which animals have always had a clear place, namely biology, ecology, and the like, the understanding of the studied animal has shifted from a relatively passive object of observation to a lively actor. In conservation, animals might be “actors” whose activities and lifeways shape the projects designed to protect them (Goedeke and Rikoon 2008). At a symposium on changing views of primates and primatology, Bruno Latour found that “the primates themselves of course,” cause these changing views, “it is they who forced us to modify our account of them” (Latour 2000:360). In other words, animals’ actions or gazes force us to reevaluate our assessments of them. Animals are not only looked at or looked upon as passive
recipients of the human gaze (Berger 2004 [1980]), they change and learn and challenge our assumptions about them.

Primates in particular, because of their evolutionary closeness to mankind, significantly challenge the perceived break between human and nonhuman animals. Pushing back against a historical aversion to questioning human exceptionalism among the animals (Ritvo 1995, 2004), anthropology, as a discipline that spans that fuzzy border from human to nonhuman primates, is well-placed to engage this discussion. And yet even in anthropology a significant conceptual gulf between humans and other species exists. Western primatologists largely ignored the idea of “culture” among primates until the 1990s and even then found cultural more easily digestible in chimpanzees (man’s closest relative) than in monkeys (Perry 2006:173). Cultural primatology has gained steam, engaging with constructedness of the nature-culture, human-animal boundary, and questioning understood concepts like the “natural” behavior and the “natural” habitat of an animal (Riley 2006). This research contributes to the problematizing of strict taxonomies that divide human from nonhuman. Not only is taxonomy a fluid science (Groves 2000, 2001), but, as Donna Haraway marvels, “human genomes can be found in only about 10 percent of all the cells that occupy the mundane space I call my body; the other 90 percent of the cells are filled with the genomes of bacteria, fungi, protists, and such” (Haraway 2008:3). Fungi might seem rather distant, structurally and socially, from human beings, but primatologists intimately understand the closeness of humans to our primate kin.

Despite appeals to the holistic nature of the discipline, biological and cultural anthropology traditionally remain divided (Borofsky 2002; Calcagno 2003; Kirksey and Helmreich 2010:565). An important conversation has emerged within physical anthropology about bridging this divide and drawing methodologically and theoretically from both subfields,
especially in the context of research on conservation (Fuentes and Wolfe 2002; Riley 2007; Sponsel 1997; Strier 2003). Anthropology is well-positioned to consider the way that human beings interact with other species and emplace themselves in the natural world. Fuentes argues not only that “the anthropological gaze is one of our most important tools for achieving an understanding of being human and relating to other animals,” but also “part of being human involves niche construction and a dramatic and intimate engagement with and alteration of our environment” (Fuentes 2006:130). With this assessment, Fuentes places anthropology squarely in the center of negotiations of the human-animal boundaries. He also links our humanity to our penchant for environmental modification, a skill that creates both the need for and ability to implement conservation activities.

Anthropology contributes substantially to understanding the complex work of biodiversity conservation. In their 1996 review, Orlove and Brush (1996) make note of anthropology’s importance in documenting local environmental knowledge and helping to navigate the diversity of perspectives and understandings of “biodiversity” held by local people, conservation organizations, and other stakeholders. More recent ethnographic work “allows us to understand the emergent rationalities and identities, and the multiple natures, resulting from the project to conserve [biodiversity]” (Lowe 2006:6) and to watch the “social drama” that unfolds as conservation projects attempt to integrate local populations with conservation and development projects (Walley 2004). Divergent expectations of the meaning and impact of conservation projects can cause friction or disappointment in local people and conservationists alike (West 2006), and at the root of differing understandings of conservation are often diverse (and racially and politically fraught) understandings of nature (Kosek 2006). In addition to ethnographic insights into daily practice and local understanding, the anthropological approach
allows for analyses of scientific practice and the establishment of facts about nature “without presupposing that modern science simply reflects true nature” (Cussins 2000:335). Cussins, a sociologist, is more broadly interested in the sociology of scientific knowledge. Social studies of science provide insight into the production of scientific fact (Latour and Woolgar 1979) and can reveal the multiple shifting boundaries between human and non-human animals (Haraway 1997; Helmreich 2001). This last point is important to this dissertation because it suggests a place at the proverbial table for non-human stakeholders in the unfolding work of conservation.

The relationships between animals and people, are not just representative reflections of the way that people view the world. As we think with and about animals, animals challenge their human interlocuters; “animals of various sorts might have a face, which is to say animals might call upon and obligate me in ways that I cannot fully appreciate” (Calarco 2008:5). Animals cannot be ignored and are integral parts of both ecological and social systems (West 2005).

Returning to the contested legal and ideological terrain of hunting rights in the U.S. in the early 20th century,

the ability of wild animal populations to rebound, far outstripping even the most optimistic projections of conservationists, meant that these contests could expand into new places in the years to come. As they did, they divided communities, but they also provided a reason to rethink the way people lived on the land and alongside one another. [Warren 1997:182]

Animal resilience demands an ongoing discussion of how diverse groups of people relate to the natural world and the animals themselves.

The Work Ahead

Though my family and friends casually refer to it as my “monkey paper,” this dissertation is not, ultimately, about animals. It is about the way that people and animals relate to
agricultural land, forests, and one another under the auspices of an international and local conversation about wildlife conservation. “Conservation” is hardly an obvious, or singular, concept. It is an action and an ideology, a science and an economics, a concern of local and global scope, and a project tightly bound to both histories and futures. In my initial conception of the project, the tamarin was the bright golden sun around which this multitude of issues and explorations might orbit. However, like so many ideas conceived of alone at a desk, when I hopped off of the bus at the entrance to the Poço das Antas reserve, my neat characterization proved inadequate to the complexities of conservation as it is lived and practiced in Casimiro de Abreu. I found my original framework inadequate largely because “conservation” turned out to be a diverse set of practices, many of which intersected with the tamarin only tangentially. Each element of the effort to conserve the GLT was encircled by its very own set of orbital objects.

The tamarin is not the only star in the galaxy, but it is still a useful character. As discussed in the section above, animals are “good to think with” (to recycle Levi-Strauss’s well-worn declaration) and the tamarins of southeastern Brazil think, farm, and conserve alongside people. By trying to “locate” the tamarin in politics, history, rights, and views of the land, this dissertation calls attention to the numerous points of influence and intersection between tamarins and these broader themes.

In chapter 2, I consider the varied perspectives that allow conservationists to understand the contiguous landscape in discrete pieces that can be conserved or restored from field into forest. I examine the process of forest restoration and explore questions about what a forest moves from and to in the process of being restored. Next, in chapter 3, I discuss the tamarins themselves, providing an overview of their evolutionary history and contemplating their contemporary, social significance. Tourists, the AMLD, and locals understand the proper place
of the tamarins in the landscape in different ways. Moving above and beyond the tamarin’s status as a cute and iconic animal, this chapter closes by reviewing a letter sent to the AMLD that reveals not only evidence of these differences in perspective but also links the tamarins to Brazilian legal history and land politics. In this region, ecologically sound agricultural practices are strongly linked to the landless workers’ social movement, thus, my discussion of the agroforestry process in chapter 4 interrogates the numerous intersections and confrontations between past and future, between social classes and racial groups, and between conservation and agriculture. In chapter 5 I return to the forest and the tamarins with the dedicated people of the AMLD field team who have spent over three decades monitoring the daily lives of these tiny monkeys. There, among the bromeliads and tangled branches of the Brazilian Atlantic Forest, the decades of data about the tamarin collected by the team, determines the process of forest conservation in this region and, along the way, indelibly shapes tamarin, human, and forest futures.
CHAPTER 2, Forest restoration: Chasing equilibrium, perfecting nature

Planting (1st stage)
0. *Cerca* (fence): necessary if there are cattle nearby
1. *Controle de formiga* (ant control): 10g/1m², leave for a few days, if there are ants they will die, if not fine. Regardless, ants cleared.
3. *Roçada química* (chemical mowing): put herbicide on the cut grass, leave 2-3 days
4. *Coroas de abertura* (opening the crowns [spaces for saplings]): create circles +/- 1m in diameter
5. *Calagem* (liming): add Ca. Brazilian soil is very acidic (<7 pH) needs to be neutralized
6. *Aberturas de covas* (opening holes): Samuel also says they are working on getting a mechanized post hole digger, but people here just don't know how to use this stuff.
7. *Adubação base* (base fertilizer): nitrogen, phosphorous, potassium in this ratio 4N-14P-8K. Brazilian soil is very poor in phosphorous in general.
8. *Plantio* (planting): Wait 30-45 days then count the surviving plants. 10-15% loss is normal.
9. *Replantio* (re-planting): > 10-15% is bad, something is wrong, replant.
10. *Adubação cobertura* (top fertilizer): This time 14N-08P-28K.
11. *Controle de formigas* (ant control): more ant poison, so they don't eat the saplings.

From 1-11 this process takes +/- 60 days.
--fieldnotes, February 25, 2010

For forty days it had not rained, and so the downpour that crashed over the roof of the little office building on the edge of the forest was welcomed. With the deluge, the office that the AMLD let me use became a warm, humid mosquito shelter. So I stepped out. Samuel sat at a wire table with a cigarette in his hand and a notebook in his lap in the tarp-covered patio between my office and the kitchen. I joined him there, and asked what he was working on. He showed me the page of calculations, a budget for a new restoration project to be funded by the *Banco Nacional de Desenvolvimento Econômico e Social* (Brazilian Development Bank, BNDES).

When I admitted that I had no idea what went into forest restoration, he flipped back in his
notebook of neat numbers and computations to a list of procedures for planting. Voices raised to carry over the din of the rain, we spent the next 45 minutes going over the eleven stages of planting (outlined at the opening of this chapter), the following twelve months of maintenance, the additional four years of vigilance to assure the viability of the forested area, the budget requirements, and the need to train local people to be able to perform these tasks.

Forest restoration is a major component of conservation initiatives in the Brazilian Atlantic Forest, from Conservation International to WWF-Brasil to the AMLD. Restoration is not a new trend. Much of the land that is currently counted as forest is, in actuality, former pasture that has reverted to forest, through neglect or through concerted effort, within the last half century. Next to none of the extant Atlantic Forest habitat has been left undisturbed (Mittermeier et al. 1982:3). The Poço das Antas biological reserve became Brazil’s first biological preserve in 1974 and is the home of the AMLD. The reserve is comprised for the most part of reconstituted forest. Two decades ago, 20% of the reserve was still pasture (Kolb 1993) and did not have sufficient forested area for a viable golden lion tamarin population (Pessamílio 1994). The reserve now has a main block of forest supplemented by a series of forest “islands” surrounded by grassland (Brito et al. 2004). The aim of restoration is to intervene on behalf of an immensely complex ecosystem. The degree of development in the part of the country that contains the small amount of remaining Atlantic Forest contributes to the challenge of restoration, as conservationists must more efficiently and effectively rebuild the forest even as human pressure on the habitat continues.

The task of restoring a section of forest is both science and art. Tossing some seeds in an empty field and leaving them to their own devices does not produce results on the scale required by conservationists. Given a century’s respite from clear-cutting, urban expansion, and other
destruction human influence what ecosystem could not recover? Forest restoration of the human
guided variety becomes necessary “when the ecosystem fails to naturally recover or when this
process may take over centuries to occur” (Rodrigues et al. 2009:1242). Anthropic damage is
countered with human chemical and labor interventions. Fertilizers, pesticides, weeding,
mowing, and replanting will reclaim degraded land for the forest on a timetable measured in
decades rather than generations, an inconceivable feat without these tools.28 There are various
opinions on how best to deploy our advancing scientific prowess towards the goal of pulling an
ecosystem back from the brink. Far from a coldly rational equation, different approaches to
forest restoration draw from distinct perspectives of man’s relationship to the natural world.

At first glance “restoration” seems to most easily reference the past, but, like the similarly
nebulous concept of “development”, it is rife with implications about power and national
historical narrative that have as least as much to do with the desired future and the contentious
present as they do about the imagined past. Speaking of the built environment, geographer
Gregory Ashworth suggests that, “structures and sites are seen as vehicles for the transmission of
historicity, contributing to many contemporary social, political, and economic needs;” thus, in
this “heritage paradigm” the purpose of preservation is “not to preserve anything from the past
but to use the past in the present” (Ashworth 2011:10). He goes on to elaborate that, “a heritage
approach asks only what are the needs of the present that a past transformed into heritage can
help satisfy” (Ashworth 2011:11). Drawing this argument from built environment to the natural
environment and forest restoration we must consider that, “ecological rules that applied in the
past may not apply in the future and we may have to accept that we cannot go back to an exact
replica of the past” (Temperton 2007:347). Restoration of the Brazilian Atlantic Forest, an
important piece of natural national patrimony, is not a straightforward, ecological procedure.
Rather, the process is tied to historical and contemporary social histories and, as Ashworth suggests, the rebuilding of the forest speaks to a desired transformation of the future.

In this chapter I will explore the process of forest restoration and how different approaches to the problem of re-creating an ecosystem defined by its dizzying biodiversity offers insight into the ways that people think about and make sense of the world around them. This is a fundamental question, even among ecologists who ask themselves, “do disturbed communities tend to repair themselves and return to the predisturbance state, or do historical and stochastic events in a particular community produce a variety of alternative stable states?” (Temperton 2007:344). Rather than a single action, restoration is the product of a series of linked ecological, social, and legal processes. Which area gets restored, when, how, and by whom are some of the more practical considerations that are then met with deeper questions about what an area is restored from and to and what system of valuation or cultural priority is implied by that process. This chapter explores some of the numerous ways that the forest is perceived and defined and thus untangles the equally profuse, and subtly different, approaches to re-forming this hotbed of biodiversity.

A history of destruction

Conservation educators and advocates talking about the Brazilian Atlantic Forest frequently say that just 7% of the forest remains, though calculations using different methodologies provide slightly higher numbers (Ribeiro et al. 2009); the highly fragmented habitat is challenging to measure and measurement of the forest may or may not include recent regrowth and very small forest patches.29 The percentage of remaining forest is measured from the starting point of 1500, when Pedro Álvares Cabral first landed on the shore of what is now
Porto Seguro, Bahia. The first Luso-European observers of the 150 million hectares of dense tropical jungle hugged cautiously to the coast. In his historically significant letter to the king, Pero Vaz de Caminha, a member of Cabral’s expedition, offered lengthy detail about the encounters between the natives and the Portuguese, the guileless nudity of the women and the indication through hand gestures that there was gold in the land, though he also confessed that the Portuguese “interpreted this so, because we wished to” (Vaz de Caminha). Despite descriptive prowess that provides the first major historical document in Brazil’s national narrative, Vaz de Caminha looked into the forest and saw that it “is so large and so thick and of such abundant foliage that one cannot describe it” (Vaz de Caminha). He mentioned a large palm and then left the vegetative mass to its own devices.

Rather than delving into the dense jungles themselves, the Portuguese were at first generally content to trade with the native people, iron tools for the precious brazilwood that provided Europeans with a much sought-after red dye and gave the “new” landmass its name. Eventually, compelled by the search for gold, souls to save for Christianity, and fertile soils for agriculture and domestic animals, the newcomers pushed inwards, burning or chopping the dense and threateningly unfamiliar jungle as they went. As they pressed inland they “promulgated rules for civilization, for civilizing of the people, and for beautification of the land” (da Cunha 2006:11), equating beautification and civilization to clearing unruly, disorganized jungle and replacing it with agriculture, mining, and other tenets of progress.

Portuguese settlement hugged the coast from Maranhão in the northeast to Santa Catarina in the southeast, a demographic pattern that remains today. Further exploration of the continent revealed other splendid and singular ecosystems like the cerrado (savanna of central Brazil) and the Amazon rainforest, but throughout the process of development of the country and into the
present, the majority of the population remains restricted to within 300 kilometers of the coast, essentially the same range as the Atlantic Forest, closely linking the fate of this forest to the growth of the country. Despite the construction of the great modernist experiment of Brasília, and its dedication as the new federal capital in April 1960 in an attempt to draw the political and demographic center of the country from the densely populated coast, today nearly three-quarters of Brazil’s human population shares a range with what remains of the Brazilian Atlantic Forest. The human presence in this area runs the gamut of urban and rural environmental pressures. Both of Brazil’s megatropolises, São Paulo (population 20 million) and Rio de Janeiro (population 11.5 million), and their ever expanding borders are deep within the Atlantic Forest ecosystem range. In the surrounding, more sparsely populated, areas cleared cattle pasture is a prominent landscape feature as are sugar cane and coffee plantations.

Warren Dean offers a summary of historian Alfred Crosby’s perspective on the importance of agricultural efforts to colonial projects, noting, colonization has been, historically, an essentially ecological phenomenon, in which the colonizers direct a broad and critical process of plant and animal dispersal […] It is difficult to imagine how the Europeans could have so quickly achieved such wide-spread hegemony in the New World had they not commanded an army of plant and animal domesticates. [Dean 1995:53]

Europeans cleared native flora to make way for more popular flora and more familiar fauna, which in turn kept native species at bay by eating or outcompeting them. In the southeastern coastal region sugar cane monoculture dominated the lower altitudes while the highlands were planted with coffee, which Dean explains “was especially demanding of the forest because it was believed that only land newly cleared of primary forest was suitable” (Dean 1985:55). Though contemporary techniques of shade growing coffee and employing agroforestry systems have since shown that long-term management of coffee groves is possible (I will discuss agroforestry
in more detail chapter 4), coffee had a devastating effect on the forest. In the early 19th century, politician José Bonifácio de Andrada e Silva recommended “that landowners be required to keep forest reserves on their holdings” (Dean 1995:221), and local observers began to comment on the impact of forest destruction on the environment and on the climate as early as the 1860s (Stein 1985:218). Dean credits the late 19th century social theorist Alberto Torres as “possibly the first [Brazilian] to employ the term ‘conservation’ in the sense it had acquired in the United States” noting that in Torres’s view “conservation, along with investments in human capital, might overthrow European conceptions of the inappropriateness of the tropics for civilization” (Dean 1985:58). This history of criticism went unheeded and destructive agricultural practices continued. Inefficient and relentless agriculture quickly depleted the rich soil before it could replenish itself; sapped lands were given over to cattle.

Despite the scale of forest destruction wrought by cavalier agriculture, “urban middle class consumers considered the railroads to be the major predators of forested lands” (Dean 1985:56). In order to allay these concerns, the Paulista Railroad company embarked on a project of planting forest to supply fuel. They hired an agronomist by the name of Edmundo Navarro de Andrade to head up this project, and though he gained notoriety as an important figure in early Brazilian conservation, he thought that the coastal forests “were too heterogeneous and too slow-growing, therefore of use only when reduced to ashes” (Dean 1985:57). He preferred eucalyptus, a fast growing Australian import.³² Navarro became the head of the Brazilian Forestry Service in 1911, and during his five year tenure the agency ceased research on native plant species and instead concentrated on growing eucalyptus (Dean 1995:237). He was not interested in forest restoration. His focus was instead on the most efficient way to produce the immense amount of fuel required by the railroad. Contemporary critiques of Navarro found fault
in focusing on a single, non-native, species at the expense of appreciating the diversity of native hardwoods (Martini 2004:91); in his own defense, Navarro pointed out that coffee monoculture (also an introduced species) had made the southeastern region rich (Martini 2004:95). Stands of tall, thin, evenly spaced eucalyptus are still common in southeastern Brazil, and the country remains the second largest producer of commercial eucalyptus. Some efforts at forest restoration took place in the latter half of the 1800s around what is now the Tijuca National Park, but early reforestation, as described above in the case of eucalyptus, freely used exotic species alongside natives. It was not until the 1970s that “restoration ecology started to emerge as a formal line of research” (Rodrigues et al. 2009:1243). Even then, “ecological processes responsible for forest maintenance were largely ignored” as the aim of reforestation was “to protect water and soil resources rather than forest biodiversity” (Rodrigues et al. 2009:1243). This kind of restoration did not often lead to permanent forest regrowth. The use of native (though not necessarily regional) species became more common in the 1980s, and only in the early 2000s has Brazilian forest restoration become concerned with genetic diversity and local seed collection (Rodrigues et al. 2009:1244).

The effect of centuries of destruction on the landscape is visible from a distance: light green expanses of pasture and yellow-green fields interspersed with the deep green of what remains of the Atlantic Forest. The patchwork landscape of varying hues of green is captivating to watch from the air when flying or from a bus window, a beautiful quilt of verdant shades. I found it picturesque until I realized that the brighter pieces meant absent forest. Perhaps I, like the Portuguese explorers of old who looked into the matted jungle and saw a terrible place of ungodliness and savagery, needed to refashion my perspective on this landscape in order to appreciate the dark, complex pieces between the open, more accessible fields. In order for the
Atlantic Forest and its numerous denizens to survive, the multi-colored patchwork needs to be transformed into a solid, dark green mass, a monotone hue that represents the exact opposite of homogeneity. The uniformity of deep green hides a vibrant and thriving diverse ecosystem.

The work of forest restoration

_Looming perspective_

With intense urbanization and an agricultural history of sugar cane, bananas, coffee, and cattle, such substantial amounts of the southeastern Atlantic Forest have been cleared that the tiny patches left cannot maintain the natural systems and levels of biodiversity necessary for the long-term survival of the ecosystem; from this unfortunate fact stems the need for restoration. Although any conservation educator or economist will note that it is astronomically more expensive to restore devastated habitat than to not destroy things to begin with, for many delicate ecosystems it is too late for this simple, practical approach. If the forest is going to survive to the point at which it can support the flora and fauna necessary for a self-sustaining ecosystem and can be left alone to recuperate after minor interferences, then the current acreage will have to be strategically increased. Economic and logistical realities dictate that the entire forest cannot be replanted. And, as mentioned above, over 70% of Brazil’s human population shares the physical space that the forest once occupied. Even assuming a halt to urban expansion (which is far from realistic), if this unique ecosystem is to survive, it will have to do so in the crannies around and between an enormous quantity of human settlements, including two of the world’s largest cities. Trees will have to be placed strategically to reconstruct this new, flexible forest. The placement of trees requires someone to do the placing, forest restoration and conservation depend on
impressive inputs of human labor, which I will discuss further below. Before these anthropoid forces are deployed, however, there must be somewhere, some place, selected for restoration.

Early on an overcast Tuesday morning I hopped in the car with Alex, Samuel, and Vinícius. We headed to a wooded extinct volcano near the coast of the Casimiro de Abreu municipality. We turned off of the highway and wended our way through the dirt roads of a ramshackle neighborhood until we found ourselves on a large, flat plain. A flock of black vultures sat on the grass, wings arched open, ominously collecting what warmth they could, recharging enough to swoop back into action, digesting flesh too rotten for other animals to safely consume. They were dwarfed by the miserable gray sky. Beside the road a few trucks growled, scooping sand from one little hill to another, creating a vaguely ominous effect. The sparse grass and muddy pools between sand piles stand in stark contrast to the wide, squat hill covered in dense forest. I did not know what the sand was for, and before I could ask we reached the base of the hill, where we stopped and got out of the car. Here the grey mist of the day brushed over tangled growth and made everything seem lush and fertile rather than soggy and dismal as it had below on the plain. Alex handed Samuel a clipboard and they plunged into the scruffy growth at the edge of the forest. Their task was to walk through the woods checking off the species that they spotted, as well as to write down those, native and non-native, that did not appear on the list. The list was divided into species representing three phases of forest growth. From the data they collected they would be able to assess the general condition of this forest fragment as estimates of the age of the forest can be made based on the presence of certain plant species that are predominant at different phases of growth (see Reis et al. 1999). They called Latin and popular names back and forth to each other, examining leaves and crushing them to confirm their smell. Vinícius and I followed awkwardly behind them, and he asked me if I
recognized anything. We agreed that all but the most obvious species were lost on us. His nonchalant confession of ignorance made me wonder why he had come at all; as the Tamarin Association’s one GIS lab technician surely he had work waiting for him at the office.

After lunch we drove to another section of the hill and continued the same activity. By then a light but steady rain sprinkled over us. Alex and Samuel continued to confer over the clipboard. Vinícius stood under the shelter of one of the more broad leafed trees. His sole job seemed to be holding the car key and letting a cigarette dangle from his mouth. I jokingly asked him if he was our tour guide, and to my surprise he answered in the affirmative. The situation began to make sense to me. He admittedly knew nothing about plants, but Samuel and Alex needed someone to tell them where to find forested patches, someone to guide them through towns and pastures to get to these species that they can name, the forest that they can read. From the satellite to the muddy trail it takes these two teams, two views, to begin the work of forest restoration.

Figure 5. The morro (hill)

Satellite images analyzed in the GIS lab at the AMLD reveal a super-human, super-natural, perspective on the precarious situation of the Brazilian Atlantic Forest. Not only does very little forest remain, but the little blotches of deep green are isolated patches, as though the whole landscape suffers from mange. To imagine a complete forest out of these sorry little spots on a satellite image, the size of each needs to be assessed, the quality and age of each forested
segment, their distances from each other, their location on a more familiar map that includes highways and other roads, in short, the omnipotent viewpoint must be transformed into more culturally legible material. I will discuss the presence, absence, or illegibility of the human presence on this landscape later in chapter 4. Here I focus on how the forest comes to be understood and mapped both literally and conceptually in the name of conservation.

Vinícius, Samuel, and Alex were not mapping this area out of a detached scientific interest in assessing the forest. The AMLD’s mission is to establish connected and protected habitat for the golden lion tamarin. Towards this end, the GIS lab often produces the supporting documentation that landowners need to establish their properties as Reservas Particulares de Patrimônio Natural (Private Natural Heritage Reserves, RPPNs). RPPNs remain legally in the possession of their owners, but are permanently protected areas of natural habitat. The AMLD provides surveying services necessary for the RPPN application that are also, not coincidentally, useful for local proprietors who often do not possess official documentation of the extent of their landholdings. The lack of official documentation of landholdings emerged from historical tradition; in the 19th century, “boundaries were defined as much by the reach of their [landowners] power as by geographic surveys” (Rogers 2010:47) and boundaries frequently remain nebulous thanks to “the problem of costly geographical information” (Brannstrom 2001:872). The restored forest thus belongs not only to a geographical map of forest cover and animal habitat, but to a political map of land ownership. Human and physical geographies overlap to form a new landscape that is unintelligible without both perspectives. Even though the forest covering the hill is one geographical area, we eventually make three different stops. Vinicius’s knowledge of property lines in the area informed him that there are three separate properties that each claim a piece of this one geographical feature. The coterminous landscape is
bounded by human relationships (Ingold 1993:156), and these boundaries shape how we think of the forest. Practically speaking, “a forest,” in the singular, could not be saved; it would have to be preserved in three discrete segments at the behest of the three owners individually. It is here that physical geography meets politics and the social realities of conservation begin to emerge.

In his classic work of environmental history, *Nature’s Metropolis*, William Cronon traces the birth of Chicago as the U.S. expanded to the west. Historians of Chicago often laud the physical attributes of the location as a way to construct a narrative of the inevitable greatness of the city, but Cronon refuses to ignore the human impact on the allegedly organic process, taking into account the politicking and decision-making that created the conditions for the Second City. The prehistories and histories of both the Atlantic Forest (Dean 1995) and the Amazon (Raffles 2002) show ample evidence of human interaction and engineering. And influence on the landscape need not be limited to localized or physical doings. Forests can also be thought of as the products of “friction” between global markets, nature lovers, commodities, activists, and systems of classification (Tsing 2005).

These descriptions of the different kinds of historical, geographical, and economic landscapes writ onto scenes that are idealized as outside of human influence provide an instructive backdrop for what is going on during this field visit to the volcano. There is nothing inevitable about the forest that emerges from these varying layers of negotiation; the map of the Atlantic Forest cannot be attributed to purely natural forces. Like Cronon’s description of the rise of Chicago, the range of the Atlantic Forest owes much to human manipulation and negotiation.

_Brazilian environmental law and the realities of forest restoration_
Brazilian environmental law dictates that any property within the Atlantic Forest biome must have 20% of its land set aside as legal reserve. While compliance with this law is hit or miss, it does give conservationists a helpful platform from which to advocate for forest restoration. Like so much else about Brazilian law, however, the complex specifics confuse many landowners. Above and beyond the legal reserve (RL), forest above 100 meters cannot be cut down nor hills with a grade of 45° or greater, streams less than 10 meters wide must have 30 meters of forest on either side, and larger streams require larger riparian forest. As I recounted earlier in the story of the Casimiro de Abreu fish tank debacle, not even government employees nor professed experts are impervious to the vast potential for error when faced with the abundant minutiae of the law. Conservationists are challenged to make these laws legible to their constituents (and to themselves) so that they can make convincing arguments for how they can intervene to assist people in compliance with the law and simultaneously amiably promote the conservation of the forest. This requires a delicate touch in Brazil, where the general public views nonprofits with ambivalence or even suspicion (Landim 1997). The AMLD shares an office area with IBAMA, the Brazilian government’s environmental agency, thus increasing the apprehension of local people who fear the denuncia (reporting) of the smallest infraction to the government. Because of this suspicion, AMLD employees working in the community must offer to help people with forest restoration projects to comply with environmental laws without pointing out too directly that they have noticed any non-compliance.

The Brazilian government supports the program for Private Natural Heritage Reserves (RPPNs). Landowners who willingly set aside additional amounts of their property as natural habitat for perpetuity receive an exemption from the rural land tax, access to funds for replanting and management of the area, and support from national and international conservation groups.
and universities. Some savvy possessors of RRPNs benefit from ecotourism traffic and other positive press in recognition of their efforts. The land remains in their possession, but it becomes legally protected forest that cannot be cut down or destroyed. The AMLD is interested in advertising and promoting the RPPN program as these properties provide partnerships with individuals providing critical pieces of habitat to the often dizzying jigsaw puzzle of the Atlantic Forest restoration project. The organization may offer to provide surveying services (a sure temptation as much land lacks the proper ownership documentation and the process of acquiring such documentation is pricey and complicated) or even reforestation of a proposed RPPN area as an incentive to local landowners who might see the economic potential of ecotourism.

Seu Vigier, a wealthy local landowner, finds the whole prospect of expecting anyone to cede over land to the government totally ridiculous. The land offered to the AMLD for reforestation is often steep or otherwise difficult to access, the landowner only becoming generous with land too precarious for cattle or planting. Of course, he tells me with condescension for these silly environmentalists, he also wouldn’t willingly part with land that he considered productive. The idea that some uses of land are better or more valuable than others is neither limited to Brazil nor to discussions of conservation. In Mexico, “expanding forests, living trees, and mobile agricultural fields were rendered invisible by official efforts to produce environmental order” (Mathews 2011:115); the forestry service in this case was unwilling to accept the place of fire in the natural forest cycle. I will discuss the historical concept of productive land in Brazil in chapter 4.

Seu Vigier describes environmentalists as hopeless dreamers while it is the farmers who are interested in the sound management of land. He also has nothing but contempt for IBAMA, Brazil’s environmental agency, for enforcing outdated and absurd laws. Neither the corrupt
lawmakers nor the inept environmentalists can tell him anything useful about how to manage the land. He does not even support agroforestry, a combination of agriculture and forest that integrates numerous different species of plants in an effort to improve the overall health of the land and support sustainable agriculture.

The problem, he says, is that once you plant trees you are not allowed to remove them without permission. What if your circumstances change or you want to do something new with your land? Projects like forest restoration are not reversible; once legal reserve is created on a property it cannot be removed. By locking certain decisions into place, adding further restrictions on an already complicated sheet of laws, the new rules for the forest take away the fluidity and adaptability that a farmer working his land might require. The classification of nature as an object of national patrimony, in writing at least, imposed by the government answers to a global valuation of nature. This valuation does not necessarily resonate with the Brazilian national cultural legacy that equates mastery over nature with moral fortitude and diligence. The civilized world of cities and European refinement could be damaged or even overcome by the “degeneracy” of barbaric Latin American nature (Collins 2008:300). These sensibilities have their roots in the positivist values of the late 19th and early 20th centuries, well-articulated by one of Brazil’s preeminent cultural essayists, Euclides da Cunha, who returned from the Amazon and described a land “naturally graceless and sad because it is new” (da Cunha 2006:32). Da Cunha felt “the forest lacks the artistic touches that human labor adds” (da Cunha 2006:32). Happily, the formless, tragic untouched landscape was soon remedied by human intervention, “in less than thirty years the area that was a vague geographical term, a swampy wilderness stretching out limitlessly to the southwest, has suddenly defined itself, contributing substantially to our economic development” (da Cunha 2006:36). At the time da Cunha wrote of this of the
Amazon, the early 20th century, the Atlantic Forest had already been wrested from the grasp of nature, inserted into the economy of the country. For European explorers of the tropics, “the image of incompatability between human existence and the tropical forest […] has been used to defend the clearing of the forest and the agricultural and colonial enterprise” (Duarte 2004:33).

Order creates beauty and a civilized nation; hard-working farmers impose order on the land in the form of agriculture. Seu Vigier makes the distinction between lei no papel and lei na vida (the law on paper and the law in reality.) Though I see his perspectives as rooted in Brazil’s colonial past, he sees himself as too modern for the law, claiming that environmental law dates from the 1930s and thus has very little to do with the modern agricultural realities. His view places preservation and development in opposition, the former “being the prevention of change, or at least mitigation of the effects of change, with its objective being to maintain what exists now into the future” while the latter “being the deliberate encouragement of a particular and desirable type of change” (Ashworth 2011:5). For Vigier, agriculture is more modern than conservation or restoration, largely because he equates modernity with productivity. He values modern farming methods for their efficiency and order as opposed to conservation’s looking backwards (to old laws and to old versions of the landscape) and its chaos. His view strikes me as “the ambivalent Latin American discourse of modernity” which, “in its rejection of European domination but its internalization of its civilizing mission, has taken the form of a process of self-colonization which assumes distinct forms in different political contexts and historical periods” (Coronil 1997:73). Vigier is a “high modernist” with lofty dreams of orderly agriculture “imposing on disorderly nature the neatly arranged constructs of science” (Scott 1999:15). Crop rotation, use of selected invasive species, and capital invested in farm equipment makes the land more productive and more efficient.
Mandana Limbert offers a different perspective of what it means to be modern, suggesting, “it can also be a distinct form of development temporality, one in which “modernity” becomes less an irrevocable and final stage in a teleology of development than a contingent, surprising, and bounded era” (Limbert 2010:10). Vigier draws linkages between the goals of the present day environmentalists and the laws he declares are outdated. He does not see his views as similarly bound, or in conversation with, social structures or perspectives of the past. To hear him tell it, he has burst from the shackles of the past with an almost revolutionary view of how things should be. Law, by its nature, is based in tradition, and tradition for Vigier is equivalent to the past which is overtaken by modernity. But modernity, as Limbert points out, is surprisingly bounded. While Vigier might believe himself to be freed from the shackles of reference to an irrelevant past and legal tradition, his desired future is a response to a particular past and present. He rejects the laws and restoration in favor of his own understanding of the modern, the future. Neither the oil people, nor the environmentalists will guide us towards a fitting relationship with nature, the farmers will. In this localized, land-based future, the “exceptional” view of the farmer is “a way of constructing shifting forms of inclusion and exclusion selectively available to differentially situated actors” (Collins 2008:302). In this case, the fate of modern Brazil rests in the hands of the capable agriculturalists who are not morally bound to the legal decisions of the environmental past or the economic promise of an oil rich future.

Vigier’s notion of the modern is temporally frenetic, much like the bound relationship between the past and present, progress and nostalgia that Limbert finds in Oman. His critique of the equally absurd (in his mind) notions that either environmentalists or oil people are the future is contained within a nostalgia for a glorious plantation past. He does not yearn for slavery but
does admire the system in which hardworking Swiss and German descendants move around the region, following the local agricultural seasons with their sturdy work ethic. This rosy and white-washed version of Brazil’s agricultural past evokes “selective rememberings that mythologize a nation’s past and displace from consciousness conflictual aspects of its historical origins, these national imaginings evoke a sacralized conception of the nation as an eternal community” (Coronil 1997:67). Vigier’s sacralized past and present is highly local. With a claim for the historical exceptionalism of the region, he talks about the ugliness of slavery as something that existed in the cane fields of Campos to the north and resulted in the slums to the south in the city of Rio. Here in the Serra Mar he imagines a dignified past and a glorious future. If only the sanctity and potential of agriculture in this region were acknowledged.

While I am not entirely convinced by all of Seu Vigier’s arguments, I am at least more sensitive to the nervousness that might be involved in the decision to sign away a section of land to a government that is not known for its trustworthiness or consistency. Not only is the government is shifty, a moving target, nature itself is cloaked in the murmured whispers of historical vagary. The habit of placing nature in a binary with culture, as in culture versus nature or nature versus nurture, suggests two fixed monoliths opposing one another rather than a dance between negotiated and re-negotiated concepts. To give the broadest overview of the changing classification of nature: colonial history reveals nature as a threat to be conquered, then a resource to be exploited, an inconvenience to be diverted or paved, and now a treasure to be preserved (though the latter is certainly not embraced by all) as having “intrinsic values, quite divorced from their present utility values” (Ashworth 2011:2). Speaking for the case of Mexico, Mathews says,

Since its […] forestry and conservation have been quintessentially state activities, and states have sought to assert their authority over forests through rhetorics of legibility and
transparent knowledge. Controlling nature for economic, strategic, and environmental reasons has been part of the constitution of modern states, and performing the control and legibility of nature has been one way in which rulers have tried to establish the stability and reasonableness of rule. [Mathews 2011:19]

A future change in the government or shift in the tide of international understanding of conservation could easily yield a new definition of nature favoring a new agenda, and trends in environmental conservation have a bad habit of overlooking or devaluing local practices and wisdom (West 2006:164). Perhaps Seu Vigier is wise to be cautious of committing to today’s definition. Though restoration often evokes a relationship with the past, restoring the forest to former glory, he suggests that the more important relationship of this project is with the uncertain future, the new lens with which the past might be interpreted, actions valuated, and new directions demanded of a harried citizenry. Perhaps, for now, crags in rolling hills are the only spaces that environmental and enforcement agencies deserve until they can prove their reliability to the public.

*Forest restoration at the AMLD*

The corridor that I visited with Alex in February was in bad shape. The capim (grass) on the steep and uneven terrain came up to my armpits. He attributed this fact to Samuel’s lack of attention to the particulars of maintenance and budgeting (Alex was a new hire and Samuel has been with the AMLD for several years), though surely the fact that the corridor clung to a deep crease between two steep hills certainly did not bode well for the project from the start. Ants had eaten nearly all of the delicate young tree seedlings.43 Alex informed me that not only do the aggressive and abundant grasses compete for space, they also release a toxin into the soil that impedes the growth of trees, thus assuring the unimpeded direct sunlight that the grasses thrive on. Maintenance must be constant and vigilant, using “mechanical or chemical control of
“Capim” (grasses) (Rodrigues et al. 2009:1247), so that the forest reaches a point that Alex called “equilibrium,” at which it can sustain itself. However, the AMLD employs just one man to maintain the nine hectare area. The man arrives by bicycle, the project lacks funds for a vehicle, and his only tools are hoes and machetes that he hides in the grass. 44 When we visited, the man told Alex that he does not like working in the area near the woods because there are hunters there who will think he is there to denounce them for poaching. Alex was incredulous, thinking it is far more likely that the man simply did not like working that area because of the steepness of that side the plot. On the other hand, the obvious impossibility of a single person taking care of so large an area frustrated Alex.

Figure 6. Capim (grass)

In general, Alex seems very focused on his concept of equilibrium and confident that strategic, scientific human intervention is the way to accomplish it. In our conversations over the ensuing months, he spoke often about balance, from diet to the nitrogen cycle. Changes occur in nature, but they are cyclical or successional. If the systems of the natural world maintain the proper balance of forces, they can sustain themselves in perpetuity. Alex’s world, in defiance of the somewhat chaotic Brazil of popular imagination, is one that can be well-ordered and organized. He is the newest, youngest, and best educated member of this particular team at the
Tamarin Association. The potential for conflict along all three of those fault lines is strong, but, without being smug, he is blithely unfazed and unapologetically self-assured in his work.

Scientific management of preserved areas is far from a new concept, either for conservation in general or in this region. At Poço das Antas, biologists tried experimental tactics in an effort to discover more financially sound and time-effective restoration techniques than traditional planting methods (Kolb 1993). They planted circular patches in hopes of natural concentric growth. They also created reforested islands based on the maximum open area certain species will cross in order to effectively link larger tracts of forest without reforesting the entire space between them. The strategy of a creating a “mosaic” of functionally linked fragments is employed not only within Poço das Antas but throughout the Atlantic Forest region (Ribeiro et al. 2009:1150). Connective corridors strategically planted within less than 100 meters of one another “greatly affect the speed and trajectory of forest recovery” and also aid “the reestablishment of critical ecological interactions” (Rodrigues et al. 2009:1246) that give the forest enough of a push to establish its own equilibrium.

It is Samuel, the tortured poet to his new supervisor’s energetic up-and-comer, who later explained to me in step-by-step detail the procedure required to achieve Alex’s equilibrium (see excerpt at the opening of this chapter.) “Planting” (never mind maintenance) requires 11 stages and give or take 60 days. The constant vigilance and regular maintenance demanded to create forest out of pasture leaves plenty of room for failure at every stage. Though Seu Vigier may express indignation that classification as forest is irreversible it might relieve him to realize the unforgiving uphill battle (often literally uphill) Samuel faces. Seu Vigier’s description of the forest and its co-conspirator the environmentalist harkens back to conquest era impressions of the New World jungles ravenously lurking at the edge of European settlement, a constant
imminent threat to order, agriculture, and civilization itself. In Samuel’s estimation, nature’s resilience is more tenuous than aggressive. I did not ask Samuel to answer for the accusation that he has let some areas go; more than once I asked him how many people are needed for various activities and how he manages as the only full-time staff person with a classically tight non-profit budget, all of which he answered with a noncommittal shrug that edges on defeated. The necessary actions include laying down ant poison, mowing and using herbicides to curb the grasses, liming, numerous stages of fertilizing, and more ant poison.

Figure 7. Standing at the top of a steep hill to be reforested

Samuel described this as the *paulista* way (from São Paulo) and says it’s ugly. The city of São Paulo is Brazil’s mega-metropolis of 20 million people and with the city at its helm, São Paulo state is the country’s economic and intellectual hub. *Paulistas* have a reputation comparable to New Yorkers in the US, as no-nonsense residents of a fast-paced urban center. Samuel is from Minas Gerais, along with Rio and São Paulo another population and political powerhouse in Brazil, but also known for its easy charm and friendly people. He gets almost wistful as he tells me about his hero, Professor Ademir Reis, and the alternative to the hurried, aggressive, pesticide driven restoration techniques used here. Reis’s method for reforestation begins with making piles of branches and leaf litter to create attractive hiding places for animals who will then bring the seeds that begin the restoration process. It is a more natural way, but of course more time consuming as well, and in the end, “often the best strategy [for forest restoration] is not the more ‘ecological’ one” (Rodrigues et al. 2009:1247). Reis is from Santa
Catarina, a small southern state with an attitude more like Minas than São Paulo, according to Samuel. He directly links local culture to the preferred style of forest restoration, illustrating explicitly how human attitudes in general shape the way they approach and interact with nature. He would like to be unbound from the constraints of human practicality to engage in more ideal restoration, but that is not a possibility with limited resources and the urgency of an ecosystem in danger.

Regardless of method, forest restoration requires intensive labor. So many people work in agriculture here that I was surprised when Samuel told me that adequate labor was actually a problem for him. He explains that many people in the region keep animals and thus do not have the basic skill set required to maintain the vegetation. The region also lacks people with the training for seed collection. Much like Seu Jovelino’s SAF in the Prologue, forest restoration requires a diverse selection of native plants, and gathering seeds from older forest is an excellent way to acquire this kind of variety. But the region lacks viveiros (nurseries) raising a variety of regional forest species. The AMLD has a viveiro on the Poço das Antas reserve, but since they planted it more than a dozen years ago, the once denuded area has regrown and the increased shade impedes the growth of seedlings.

In order to increase the regional capacity to produce the species needed for effective forest restoration, in March 2010 the AMLD held a “Curso de Capacitação para produção de mudas de espécies nativas da Mata Atlântica” [Training Course for the production of native Atlantic Forest seedlings.] Over two days, the AMLD reforestation staff gave morning lectures on genetic diversity and various planting techniques, followed by hands-on practice in the afternoon. More than twenty people attended. Different plants produce seeds in different seasons, and the presenters suggested that successful seed collection also requires attention to
numerous details such as: a straight trunk (indication of the health of the parent plant) and concentration of a single species (best not to take seeds from a lone tree as their seeds are likely self-pollinating and thus less genetically diverse than those of tree growing amidst a small group of its species). I joined the other participants as the staff guided us down the educational trail in the forest next to the AMLD office to show us how to select trees for seed collection and identify them. The following day we practiced packing dirt and seeds into small plastic sacs in which *mudas* (seedlings) grow until they are ready to be transplanted. Conservation requires very specific skilled labor.

![Figure 8. Plastic sacks for mudas (seedlings)](image)

Conservation and labor have a strange relationship. Genese Sodikoff notes that “scholarly analyses of conservation have been virtually absent,” an observation that she attributes to “the way conservation has been imagined. Conservation is commonly depicted as the antithesis of production, an imposed abstinence” (Sodikoff 2009:445). Nature defined as the absence of human presence traces its origins from the “discovery” of Brazil and well into the positivist perspectives of the early 20th century when visitors to the Amazon “encounter disorder
on a lavish scale” (da Cunha 2006:4), and though “from the tilling of a soil to cultivate exotic crops to developing the aborigine to raise him to the highest destiny, the distant metropole outdid itself in efforts to open up this land” (da Cunha 2006:11), the tropical forests refused to quietly transform into neat rows of eucalyptus and coffee. This stubborn nature defies human labors such that “a single flood season would completely destroy the work of a hydrographer” (da Cunha 2006:4). Alongside this perspective of the opposition of untouched forest and progress Sodikoff offers a pithy question, “as a labor process, how is conservation productive?” She explains that, “the analytic neglect of conservation as a mode of capitalist production may be explained by the intellectual foundations of Western environmentalism wherein ‘society’ was pitted against ‘nature’” (Sodikoff 2009:445). Conservation work, as a kind of labor, is at odds with the ideas that nature is that which is left unmodified by man and labor is the productive activity that changes the forest into something more usable like a field of coffee. Samuel’s frustration at being unable to adequately merge his labor needs with the labor regionally available is a culturally created labor shortage that emerges at the intersection of two systems of the valuation of land and labor. Alex expressed awareness of a tension between the forest engineer’s understanding of the forest and the understandings of the people who live here. He found it difficult to convince growers in the region to produce the varieties of saplings needed for reforestation projects. The species he wanted are not as generally marketable as other flowering and non-local species, but nonetheless critical to the biodiversity of the forest. The logic of scientific forest management does not necessarily match the cultural, economic, or aesthetic interests of the human residents of the region.

Enter the tamarin
The Golden Lion Tamarin Association (AMLD) is, predictably, interested in restoring the forest as it is used by the tiny, gregarious, golden lion tamarin. Like so many other conservation organizations, the AMLD does not have the strange luxury of time nor its twin luxury of money to engage in protracted restoration projects. Their stated aim is to restore the tamarin population to a self-sustaining level. However, after a couple of decades focused primarily on the ecology of the animal itself, they found that the greatest impediment to their goal was the lack of forest habitat space. Much of the Atlantic Forest remnants are montane, and the tamarins’ favored habitat is lowland forest (Rylands et al. 2002). On the Poço das Antas and União reserves the tamarins “preferred swamp and hilltop forest” and “avoided hillside forest, where the densities of microhabitats, such as palm crowns, bromeliads, and lianas, were lower” (Kierulff 2002a:179).

Despite the estimation that 7% or more of the entire forest remains, just 2% of the original lion tamarin geographic range survives (Rambaldi et al. 2002). In order to restore the tamarin, the AMLD must work to restore the Atlantic Forest. A number of large forest patches remain in the primate’s range. With a well-placed forest corridor, the usable habitat space opens up immensely, providing critical connection points between formerly genetically isolated tamarin families. Successful conservation does not require the restoration of the entire forest, merely stubby mini-forest between sections of mercifully preserved older growth. The restored corridor’s specifications are dictated not only by practical concerns about time and money, but also the specific needs of this tiny primate.

Though guided by human hands and strategy, forest restoration retains the cyclical character of forest succession: plants attract animals who then bring more plants, attracting still more animals. As species of flora develop, grow, and proliferate the forest takes on, not a single shape, but rather a series of stages and phases in succession. These corridors are designed and
placed with a specific animal species, tamarins, in mind. The tree selection, width, length, and geographical placing of the area targeted for restoration answer to the value of that land to the strategic goal of connecting the golden lion tamarin metapopulation. As soon as enough time has passed for the forest to be usable, the cramped little animals will expand their territory out into the budding new space, and as they continue to use this new area they will progressively bring the seeds of their favorite plants, thereby reinforcing the “tamarinness” of the newest addition to the Brazilian Atlantic Forest. More than one person mentioned to me that monkeys are prolific little farmers. The new, tamarin-centric forest, is the product of more tamarin influence than the Atlantic Forest of centuries before. The disproportionate weight of one of the hundreds of plant and animal species native to this habitat makes for a new forest that tamarins and human beings, interested as they are in the fate of the tamarin, have manipulated. But forests are dynamic entities that change and adjust to varying influences over time, including animal behaviors that modify the environment and, eventually, alter future (animal) generations (Perry 2006:176). Sometimes time alone suffices to decisively change the character of the landscape. Through the process of forest succession, shrubs and tree species that thrive in the sun colonize an abandoned field. As the new forest ages, the “pioneer” species give way to intermediary species, which in turn give way to climax species. The plants and animals that characterize a stage in the life of the forest change with time (a fact that Alex and Samuel used to estimate the age of the forest fragment at the beginning of the chapter); each change sets off a series of other changes, and the lively forest ecosystem continues to mature. Temperton suggests that “more and more ecologists advocate the need to think about ‘designer ecosystems’” (Temperton 2007:346), a term coined by ecologist James MacMahon, in which “we as humans play the defining role in deciding what exists in that system” (Temperton 2007:346). In the Atlantic
Forest, conservationists on behalf of tamarins, or even tamarins themselves, are constructing “designer ecosystems.” Eventually, other species will use the corridors blossoming with the tamarins’ preferred flora, making their own contributions to the seed pool.

Although the AMLD’s newly planted corridors might have greater tamarin influence than previous forest areas, non-human primate presence in the Atlantic Forest pre-dates Homo sapiens’ by 25 million years. Anthropic pressures reduced this tiny primate’s population to close to nothing, and now additional human efforts drag their numbers back from the precipice, offering them a more privileged place in the forest ecosystem than they previously experienced. The resurgence of the tamarin population, and the slow but steady success of forest restoration projects that increasingly link patches of tamarin habitat together, are a testament to the dynamism and resilience of natural systems. Walking through another forest patch later with Bruno, an agronomist for the municipal Secretary of Agriculture, he pointed out a few banana and coffee plants in an older section of forest. The presence of these trees indicated that, though the forest was around a half a century old, it was once agricultural land. At some point this very patch of land was likely all banana and coffee. Not very diverse at all. Time, succession, and finally restoration efforts reclaimed the area, leaving behind a few remnants of the past as the verdant tangle grows towards its future and more changes, changes that will star the golden lion tamarin.

~ ~ ~ ~

The nature of the forest’s complexity is a tangle of threads of history, biology, politics, culture, and interspecies negotiation. Given the multiplicity of perspectives and origin points, this chapter reveals the task of forest restoration as not only a technical challenge but an ideological one. What are we restoring? From what? And for whom? This chapter has
illuminated some of the processes and histories that go a long way towards deepening those questions, if not precisely providing clarity. The last question, for whom, lingers unmet here. Most literally of course, the Golden Lion Tamarin Association as an organization wants to restore the Atlantic Forest for the tamarin. Not only is such a singularity of purpose functionally impossible, the activities surrounding their stated goal of 2,000 tamarins living in 25,000 hectares of protected and connected forest necessitate activities that bear no direct relationship to the little monkeys themselves. For the bulk of my field work I was constantly struck by the absence of mention of tamarins among the various populations of people who I had identified as key stakeholders in the long-term viability of the tamarin conservation mission in action in the region. But the tamarin is significant even in its apparent tangential-ness. In answer to my musings on the boundaries of nature and culture as they meet at the edge of the forest, the tamarin is both symbolically and literally an invitation into that abundant foliage that defied Vaz de Caminha’s descriptive prowess. It has incredible photogenic appeal; it is the perfect cover model for conservation. But the tamarin is also more than just a pretty face. With the mass of information – gathered from GIS maps, property lines, ecological studies, and diverse human perspectives on land use – required to negotiate the future of the tamarin, conservationists are also renegotiating the meaning of concepts like equilibrium and “nature” itself.

Donna Haraway says of dogs, “[they] are not surrogates for theory; they are not here just to think with. They are here to live with. Partners in the crime of human evolution” (Haraway 2003:5). In deference to both physical and genetic proximity, the tamarin too qualifies as a “companion species,” such as Haraway describes in her Manifesto, a partner in the evolution of human culture and the style of our species’ presence in the Atlantic Forest region. The fate of the tamarin and the fate of the forest are linked to each other and to the human population that
surrounds them. The goal of the AMLD’s forest restoration projects is to serve the needs of the tamarins, but tamarins are not passive objects to be acted upon. In the following chapter, I will explore more deeply the ways in which the history and habits of the tamarins challenge their human protectors to reimagine the emplacement of man, monkey, and the ecosystem as a whole.
CHAPTER 3, Tamarins

Golden squirrels

When I tell most North Americans about my project they are spellbound at the thrilling concept of spending time in a tropical paradise thinking about adorable little monkeys. Yet one day in a little room in Minas Gerais, discussing the challenges of research over warm pão de queijo (baked cheese biscuits), I described my work to an American friend and fellow researcher, Amanda. It generated little more than unruffled, knowing approval from Amanda’s husband. Emerson grew up in Mato Grosso (a rural state deep in the interior of Brazil), and he loves animals. They are not exotic novelties to be experienced in glossy magazines or breathtaking cinematography, but beautiful and ubiquitous parts of everyday life. Micos (little monkeys) in particular are normal features of Brazilian landscapes, both urban and rural. The frequent comparison of micos to squirrels is useful for North American audiences because of the animals’ similarities in size and also because thinking of them as squirrels speaks to the commonness of the little monkeys in Brazil.

Before they moved back to Brazil, Amanda’s mother-in-law came to visit them in Boston. Amanda chuckles as she recalls that her sogra (mother-in-law) returned from the park one day and told her, “you have the cutest little micos here!” She meant, of course, the squirrels. She was not at all surprised to see them since monkeys of various species dashing about parks in Brazil are commonplace. If I told my friends and family that I was going to Boston to study a rare squirrel I doubt I would have been greeted with much enthusiasm. Squirrels can be photogenic and precious, but they are also deeply ordinary. Like squirrels, micos in Brazil toe the line between cute and obnoxious, depending on context – there are squirrels adorably
nibbling acorns, there are squirrels digging through your garbage; there are little monkeys eating banana from your hand, there are little monkeys digging through your garbage. In their respective habitats, *micos* and squirrels represent an ignorable feature of wooded parks and also an anthropomorphically appealing source of delight.

![Figure 9. The golden lion tamarin](image)

The golden lion tamarin (GLT) belongs to the *mico* group and is a rare and exotic species important to national identity and representative of national concern for nature. The species is found in only a few municipalities of the state of Rio de Janeiro. After flirting with extinction in the late 1970s, the GLT experienced a population resurgence thanks to the coordinated efforts of Brazilian and American biologists. Despite an exciting, decades long, story of conservation success that culminates in the tamarin’s starring roles as poster-animal for conservation of the Brazilian Atlantic Forest, its portrait on the twenty *real* note, and now its competition for the role of mascot of the Rio Olympics in 2016, for many locals this *mico* is still much the same as other *micos*, for better or worse. Fame aside, the GLT maintains a certain degree of anonymity; to the casual observer it is just the red-headed version of a common group of animals. It is hard to tell just by looking at them that these particular tamarins are special. One requires maps of diminishing physical territory and scientific records of a distinct and small gene pool to fully
appreciate that not all cute *micos* are equal. The ecological treasure of a dedicated group of scientists is often just another piece of the natural landscape, which may or may not cause a disturbance to daily life, for the local human population. Conservation programs worldwide experience differences in perspective between conservationists and local people about the value of wildlife preservation.\(^{54}\)

A farmer struggling to make ends meet on a small plot of land might view the neighboring reserve set aside for the exclusive use of plants and animals with anything ranging from ambivalence to outright hostility. Dramatic examples of conflict exist between conservation initiatives and local people,\(^ {55}\) and the following chapter details the place of the human population in a long-term conservation agenda. Suffice it to say for now, for the most part, tamarin conservation does not inspired much animosity compared to other conservation projects.\(^ {56}\)

Plenty of people find the *micos* enchanting. Mario, an assistant in the GIS lab, was gathering information for the AMLD’s registry of rural properties. The process involved stopping at as many individual properties as possible and collecting information about who lives there, what grows on the land, how much is forested, the presence of streams, and *mico* sightings. One overcast day in May, he invited me to come with him (or perhaps I invited myself). He had already spent a number of days in this area. It takes time and what I can only describe as a singularly Brazilian sense of calm in the face of inefficiency, to canvass the back roads of the Rio Baxacá micro basin, one of the three micro basins that make up the São João River basin. Once we got off of the BR-101, the main highway, the roads were incredibly rough. Mario’s satellite map showed the river, the limits of the protected area, the precarious rural roads, and the dots marking properties already surveyed.
Mario navigated the little Fiat around holes in the dirt path and the unexpected fenced in areas, trying to wend his way down each little path in search of homesteads and people willing to talk to a man suspiciously armed with a clipboard and a GPS device. Some people invited us in, others refused to talk, one half-jokingly asked if we intended to fine him for something but seemed genuinely a bit uneasy by the officialness of the encounter. Midway through the day we stopped at a small, rough looking patch fenced in with barbed wire. A shack-like little house with a shed beside it was set forty feet or so off the narrow dirt road. The sinewy man who answered Mario’s hoots and claps never crossed to our side of his rickety barbed wire fence. Mario launched into his questionnaire: How many families live here? The man sighed and answered that it’s just him, his grandson, a woman, and two kids. The two young children ran around in the yard behind him. He seemed neither impressed nor agitated by their play, too tired, perhaps to react to the energy of little boys. He patiently answered questions about crops (a few) and streams (there are none). The man’s rheumy eyes finally lit up when Mario asked about micos. “Oh yes,” he told us, warming considerably to the conversation, “the little grey ones are all over.”

The animals that he described are common marmosets, native to certain areas of Brazil, but not to the baixada litorânea. The Casimiro region boasts two species of invasive marmoset species whose progenitors arrived as part of an ongoing illegal pet trade. One breed, the common marmoset (Callithrix jacchus), comes from the northern part of the Atlantic Forest in the state of Bahia. A second breed, the buffy-headed marmoset (Callithrix pencillata), can be found as far south as São Paulo all the way south to Bahia, though their range cuts into the center of the country to Minas Gerais and Goiás, by-passing the eastern coast of Rio de Janeiro. The two marmoset species have also interbred, creating a hybrid third species (Morais et al. 2008).
Their introduction is problematic for the golden lion tamarin. The marmosets compete with the tamarins for space and resources, often existing in larger numbers in a given sliver of forest, and seem to breed more frequently than the tamarins (French et al. 2002:136, Ruiz-Miranda et al. 2006). Scientists also feel the very real concern that they will introduce new diseases to the GLT population, especially since, as part of the illegal wildlife trade, many of the marmosets have been handled by humans and have been kept in poor sanitary conditions (Ruiz-Miranda et al. 2006; Kierulff et al. 2012).

The man in front of his shack clearly found the marmosets on his property endearing, but Mario sarcastically chuckled to himself once we were back in the car. He called the marmosets the poor cousin of the tamarin. I imagine that, unfettered by concerns over flagship animals and invasive species, it is not difficult to find all micos equally delightful. Even when AMLD employees explain to people that the grey micos, called mico estrela or sagüis, are not native to the region, most people shrug and say that they are still pretty cute.

Among tourists I encountered a similarly wistful reluctance to condemn the marmoset. Once in a while, international tourists popped out of Rio early in the morning to see the tamarins. After their time in the forest, they come to the AMLD educational center to learn more about the animals, the forest, and the organization working to maintain both. As the resident expert at speaking English, I occasionally made the presentation and explained the historical and contemporary challenges faced by the golden lion tamarin. Our visitors always looked slightly disappointment when I explained that the gregarious grey monkeys they just photographed were actually invasive competitors, potential vectors of disease, and threats to the limited space available for their endangered golden cousin.
I could not convince the excited American and European travelers that any of the tiny primates are fairly pedestrian creatures, or that they might have complicated ecological implications. However, I would at the very least try to explain the magnitude of the conservation challenge with a comparison to the conveniently familiar squirrel. I would show them a picture I took of a newly restored forest corridor.

![Figure 10. Reforestation project](image)

Just two years old, the site is sandwiched between the old growth of the União Biological Reserve and a private property recently acquired by the AMLD. I pointed out two little specks in the middle: Samuel and Vinicius. “They may not be extremely tall,” I quipped, “but they are full grown men. So now imagine you are the size of a squirrel and you have to cross from one side to another.” As emphasized in the preceding chapter, restoration strategies take careful consideration of the size and habits of the target species. The GLT will only venture across a deforested area of 50 meters or so, and even that distance can be unsafe without forest cover to hide them from predators. Tamarins, large-brained primates, are considerably smarter than squirrels, small-brained rodents, but their physical vulnerability is best explained to foreigners with this convenient simile. I did not want to dampen their enthusiasm for the little *micos*, but I
did hope to lend a taste of the banality of the animal to the tourists. I wanted them to understand what they have witnessed not as a rarity or oddity but as a germane piece of this ecosystem.

The Animal Ambassador

The tamarin is an appealing, powerful symbol of the forest. In many ways, conservation depends on such symbols, though not all animal symbols are employed equally. Conservation scientists use representative animals in three distinct ways. An “indicator species” provides scientists with a convenient way to monitor an ecosystem by watching one particular species or group of animals. Amphibians, for example, with their permeable skin, are generally more sensitive to pollution than other animals; a decline in amphibian populations indicates a change in the environment before scientists observe any changes in more resilient species. “Umbrella species” require such large areas of land that conservation efforts focused on them save habitat home to numerous other species. And finally, “flagship species,” regardless of conservation status, are charismatic enough to be the symbolic representative of a conservation project (Simberloff 1998).

Zoos and other conservation education organizations talk about “ambassador” species. Like the golden lion tamarin (or the Giant Panda that graces the international WWF logo and regularly makes national news when they breed, or fail to breed, at the National Zoo), these animals are called ambassadors because they make people feel closer to animalkind. In this deployment of animal ambassadors we may take liberties, imbuing them with intentions as “we create them to be able to express what we would in comparable circumstances” (Dolhinow 2002:18), but these ambassadors make “nature” more understandable to the human denizens of “culture.” Anthropomorphism has its critics (Simberloff 1998). But in the end there is no
denying our necessarily human view of the world (Bekoff 2004:495), and metaphor may
ultimately be our only accessible entrée into the worlds of animals and ecosystems (Berger 2004 [1980]).

Golden lion tamarins in the wild combine the features of an umbrella and a flagship species. They are also effective ambassadors for Altantic Forest conservation. The GLT is deeply engrained not only in the ecosystem but also the culture of the land it occupies, facts that contributed to its rise to animal ambassador stardom. But as tamarin becomes synecdoche for forest, and for conservation, what nuanced understanding of the ecosystem do we lose? Even as animal ambassadors provide an entrance into animal worlds, the metaphor itself shapes the way we come to understand tamarins and their habitat. A metaphor, “once chosen as the basis for the description of physiological events, has profound implications for the way in which a change in the basic organization of the system will be perceived” (Martin 1997:26). Experience, in other words, comes to be shaped by the metaphors and symbols that were used to describe it. Our accessible primate cousins translate the Atlantic Forest to their human interlocutors, and through this process we come to understand forest ecology and dynamics from a very particular, tamarin vantage.

However much the symbolic focus of Atlantic Forest conservation might focus on the individual species, at the end of the day, the tamarin badly needs the forest it has come to represent. There have been no reintroductions of new, captive-bred GLTs since 2003. The reason for this is simple: breeding programs and protections of the wild population have been remarkably successful and now there is nowhere for the little primates to go, never mind additional individuals introduced into the wild. The problem is no longer population but rather, space. Noting this, the institutional focus of the AMLD has shifted to reflect the growing
importance of the problem. Forest restoration, connective corridors, and protections for existing forest fragments have become major programs within the organization. The change at the AMLD is reflective of a wider shift in conservation towards “ecosystem management” in place of single-species focused projects, a more holistic approach that recognizes that indicators, umbrellas, and flagships elide the multi-faceted quality of complex ecosystems (Simberloff 1998:247).

Who is this little animal, plucked from the evolutionary mass of micos and thrust into the frenetic history of human conservation politics? The rest of this chapter explores the evolution and ecology of the tamarin and its Atlantic Forest home in order to trace the development of the conservation program that pulled the animals back from the brink of extinction. It will highlight the tamarin’s successful starring role as ambassador species for Atlantic Forest conservation. The lack of space alluded to previously will be revisited, but this time moving towards a discussion of the major cause of this lack of space: the growing human population and its subsequent encroachment on tamarin habitat. What kind of use of space is happening to make animal conservation and human livelihood compatible? And finally, this chapter will analyze a letter written to the AMLD in the late 1980s. The letter, a complaint about the misbehavior of a group of tamarins, forces a deeper consideration of the place of the tamarin in the unfolding human drama of the Atlantic Forest and draws attention to the blurry line between the animal and the human in a way that entirely complicates the boundaries of subject and object, rights and responsibility.

Tamarins and the forest in which they live
Lion tamarins (*Leontopithecus*) are part of the Callitrichidae family, a family of small New World monkeys which includes the Goeldi’s monkeys, marmosets, Amazonian tamarins, and the pygmy marmoset. The largest of the callitrichids, lion tamarins weigh in at 500-600 grams, or just around 20 ounces. There are competing hypotheses about the evolution of the callitrichids, but most researchers conclude that the lion tamarins were the first genus to evolve away from the original callitrichid ancestor (Seuánez 2002:120).

While the *Leontopithecus* ancestor likely had a geographical range that extended through much of the Atlantic Forest (Seuánez 2002:117), today the four lion tamarin species possess distinct, bounded patches of the forest’s remnants. The black lion (*Leontopithecus chrysopygus*), golden-headed lion (*Leontopithecus chrysomelas*), black-faced lion (*Leontopithecus caissara*), and the golden lion tamarin are all endemic to Brazil and survive in four separate locations along the eastern coast of the country.

![Figure 11. Lion tamarin distribution](image)

The tamarins are differentiated primarily by their color patterns and their different habitat ranges. Of the four, the GLT is the flashiest and most well-known. All of the tamarins are endangered, and, with the exception of the GLT, their populations in the wild are declining (IUCN 2012 Red List). In the 1970s, the GLT population in the wild was an estimated 200 individuals. Today 1,700 individuals live in their Atlantic Forest habitat.
Nothing called the Atlantic Forest existed in name until the late 1980s. A “provision in the 1988 Brazilian Constitution, which had determined that the ‘Atlantic Forest’ would be ‘national patrimony’ but had failed to define its location” (Brannstrom 2002:431), was later fleshed out by Presidential decrees by Collor in 1990 and Franco in 1993. Characterized by humid temperatures, a diversity of soils, epiphytic bromeliads, and a wide range of elevations (Rylands 1993:297), all of which contribute to the profusion of rare species, the Atlantic Forest spreads from Rio Grande do Sul in the south up the Eastern Coast to Rio Grande do Norte in the north. An interior block of the forest once extended west to graze the borders of Paraguay and Uruguay. The original forest encompassed heavy rainfall coastal areas as well as drier inland areas and covered a range of altitudes. Within the forest, “each region has its own peculiarities of climate regime, geology, soils, and topography” (Rodrigues et al. 2009:1243). This geographical diversity contributes to the high rates of endemism (Ribeiro et al. 2009). While only a small percentage of the forest remains, this relatively small area boasts over 250 species of mammals, 20,000 plant species (8% of the world’s identified plants), 900 bird species, and endemism rates of anywhere from 65% among primates to 32% among reptiles (CEPF 2001). And species as yet unidentified still exist in the forest.

It is not uncommon to meet non-Brazilians who have never heard of the Atlantic Forest. The larger, older Amazon dominates popular understanding of Brazil’s tropical forest, and often “the Atlantic Forest emerges as a counter-example for the preservation of the Amazon, in the guise of ‘an Atlantic Forest that is gone – and the Amazon Forest that is going’” (Duarte 2004:51). Ecologically, the Amazon and the Atlantic Forest are similar, and like the tamarin species, were once connected via a continuous range of forest. The Brazilian Atlantic Forest and the Amazon became separated from one another during one of many periods of cyclical “climate
changes [that] led to periodic shrinkages and expansion of the world’s great rainforests” (Strier 1992:9). Dry spells during the Pleistocene periodically shrank the forest, separating populations of plants and animals and creating the conditions for splits in evolutionary trajectories, thus contributing the massive numbers of unique species that characterize the Atlantic Forest (Costa 2003). 60

A (brief) history of research

First mentioned in 1519 when “the priest Antonio Pigafetta, chronicler of Magellan’s voyage around the world, provided the first known reference to golden lion tamarins after observing them in the wild” (Rylands et al. 2002) Linnaeus taxonomically described the tamarins in 1766 (Kleiman and Mallison 2008:29). From the mid-1750s onwards, GLTs and other lion tamarin species appeared in menageries across Europe, among the many exotic species dragged across the world to satisfy European curiosity about the mysterious colonial worlds of South America, Asia, and Africa. The bright orange fur of the GLT made it a popular exotic pet, in Brazil and abroad, well into the 20th century. As late as the 1960s, sales to zoos and private collectors lead to the capture of an estimated 300 tamarins a year (Coimbra-Filho and Mittermeier 1977), and as recently as 2004 the Brazilian federal police seized six golden lion tamarins (along with five golden-headed lion tamarins and other Brazilian wildlife) destined for a collector in France (AMLD 2006:13). Habitat destruction and the illegal pet trade shrank the population to an estimated 200 individuals by the 1960s when Brazilian primatologist Adelmar Coimbra-Filho took note and took action.

In 1962, Coimbra-Filho first attempted captive breeding of the tamarin at the Rio de Janeiro Zoo. By the early 1970s he and his partners secured funding from the International
Union for the Conservation of Nature and Natural Resources (IUCN), the World Wildlife Fund (WWF), and the Brazilian Government to continue captive breeding and research on the GLT. This included a captive colony in the Tijuca National Forest within the city of Rio for a brief time in the early 1970s before they were moved to the Centro de Primatologia do Rio de Janeiro (Primatology Center of Rio de Janeiro, CPRJ). The Poço das Antas biological reserve became the first biological reserve in Brazil in 1974. Located in the heart of the tamarin habitat range on the border of the Silva Jardim and Casimiro de Abreu municipalities in Rio de Janeiro state, Poço das Antas remains the headquarters of GLT conservation.

Meanwhile, U.S.-based biologists were also becoming concerned about the fate of the primate. The coordinated captive breeding program began at the National Zoo in the 1970s under the guidance of Dr. Devra Kleiman. Kleiman began to manage a detailed breeding log, or studbook, which would chronicle the matings of individual golden lion tamarins held by zoos around the world in order to minimize inbreeding and maximize genetic diversity of the pooled, global captive populations. The studbook is a key element to a Species Survival Plan®, a cooperative management plan of Association of Zoos and Aquariums participants to monitor and maintain genetically healthy captive populations of endangered species. With just 83 GLTs in captivity in the U.S. and an additional 39 in Brazil in 1975, maintaining genetic diversity was critical to the long-term survival of the species; captive tamarins could be thought of as “individual repositories of genetic capital” (Franklin 2003:97). The Golden Lion Tamarin Conservation Program was created in 1983. As part of her efforts to facilitate the captive breeding program, Kleiman advocated for transferring ownership of all captive tamarins to the Brazilian government to prevent zoos from selling the rare animals and to facilitate inter-institutional cooperation for the careful breeding program that she oversaw to pull the little
animals back from the brink of extinction. In 1990 she arranged for most of the institutions housing GLTs to do just that (Dietz 2010). The Associação Mico-Leão-Dourado (Golden Lion Tamarin Association, AMLD) was officially established as a non-profit in Brazil in 1992 to manage the conservation program.

Without the influx of new individuals or genetic lines from captured wild animals, the captive population of tamarins needs to be self-sufficient. In other words, there must be enough individuals (with enough genetic variability) for studbook keepers and other managers of captive breeding programs to maintain high genetic diversity and low rates of inbreeding without the benefit of the occasional, wild-caught specimen. Golden lion tamarins have succeeded in reaching this important point of sustainability in captivity thanks to careful studbook keeping, inter-zoo cooperation, and sophisticated understanding of pedigree and the genetic value of individual animals (Ballou et al. 2002). The end goal of a captive population, however, is not merely that it should maintain itself in perpetuity. The captive golden lion tamarin population serves as a “genetic and demographic reservoir” (Ballou et al. 2002:105) in case new and catastrophic events should befall the wild tamarins. The captive population is managed in tandem with the wild population as “it acts as a ‘source’ within the metapopulation of sufficient genetic and demographic potential to supply animals, as needed, for reintroduction, for colonization, or as a supplement to other populations without jeopardizing its own genetic and demographic viability” (Ballou et al. 2002:106). The captive population must be stable enough to “fund,” as it were, the complex process of reintroduction with the requisite genetic capital.

Reintroduction of captive animals into the wild is a science in and of itself (never mind the financial considerations.) Such a project depends on a self-sustaining captive population that “must be able to endure the loss of many animals while reintroduction techniques are
developed and perfected” (Kleiman 1989). Biologists carefully evaluate individuals selected for reintroduction by a number of factors including age, sex, family group make-up (in the case of the social tamarin); the animals should also be “as close as possible genetically to the founding specimens of the region” (Kleiman 1989). Though the first groups of reintroduced tamarins did experience high mortality rates, and the project team felt that the animals had received inadequate prerelease training, survivorship eventually improved (Oates 1999:211) and the tamarin conservation program became an exemplar for successful captive-bred reintroduction. Numerous “gateway zoos” (Kierulff et al. 2012:39) participated by preparing groups of tamarins for release, including the novel prerelease “free ranging” tamarin programs piloted at the Smithsonian National Zoo (see Beck et al. 2002). However, prerelease training did not seem to have a perceptible effect on survival rates (Kierulff et al. 2012); post-release support was far more important, with groups requiring an average of five years of provisioning to become fully independent in the wild (Kierulff et al. 2002b:281).65

From 1984 to 2000, 153 tamarins were reintroduced. Of those, 18 remained alive as of 2002. This may seem like a paltry number, but the scientists working on the reintroduction project found that, while the reintroduced tamarins struggled to survive, their wild born progeny fared far better; 341 wild born children of reintroduced parents currently flourish in the forest (Kierulff et al. 2002b:274). In addition to the reintroduced population, 250 tamarins were translocated to the União reserve, located near Poço das Antas, from various other precariously small patches of forest where their survival was not guaranteed. The AMLD field researchers also recently discovered an additional population group living at a higher altitude than biologists considered the GLT’s preferred habitat conditions (AMLD 2007).66
The AMLD keeps tabs on all of the known tamarin groups living in the wild. They fit the dominant male or female of each group with a radio collar, and assign each group a unique frequency. Five days a week the reintroduction field teams divide up to travel around the region, using machetes to slice through the errant branches creeping over their well-worn trails in order to locate (by sight or at the very least by radio signal) each tamarin group. Some of the members of the reintroduction team have been doing this job for decades. Diana, the team’s leader, has been following the monkeys for more than 30 years. The team knows the intimate details of the lives of these rare creatures. Who is whose daughter, who splintered off from their group and formed a new one, who fights with who, who was hit by a car on the highway, who wandered off and vanished into the forest. These records go back to the 1970s and represent a unique and invaluable wealth of information about a rare species (I will discuss these records, and their implications, in more detail in chapter 5).

When the occasional visitor comes out to see the tamarins, members of Diana’s team take a break from their morning rounds to bring visitors into the woods. The designated tourist group of GLTs lives on a site that is private property. (Tourists cannot go into Poço das Antas; that privilege is reserved for educational or scientific excursions and requires special government permits). The reintroduction team brings bananas, and by now the tamarins are well accustomed to the routine and are generally not long in making an appearance once the team arrives. This group is the only one without the AMLD’s identifying dye marks (tamarin individuals are nearly impossible to visually distinguish from one another, especially from a distance). As the ambassador group, they are left pure golden orange for the photographers, TV crews, and tourists who will carry their image and their story out to the world.
Local hero

The story told by the tamarins is not just the intimate tale of pioneering and passionate biologists. The tamarin has also come to stand for something larger. The image of the golden lion tamarin tells the story of Brazilian and global conservation. How did this “charismatic mini-fauna” come to mean so much?

The answer is simple from an ecological standpoint. Although it is small (500-600 grams), the territorial nature of the GLT means that family groups of 5-8 individuals require a large territory (anywhere from 40 to 100 hectares). Saving the habitat of the tamarin amounts to preserving large areas of forest that, incidentally, house countless other less charismatic species of plants and animals (Dietz et al. 1994). Tamarin preservation creates a kind of “taxonomic trickle-down” effect (Lorimer 2007:924). Thus, with a range confined to small patches of forest in Rio de Janeiro state, the golden lion tamarin has become the face of Brazilian Atlantic Forest conservation. Not only do the habitat requirements of the animal make it an excellent biological representative (umbrella species), this little primate brings charisma, inspires sympathy, and generates enthusiasm for forest conservation. Environmental efforts the world over depend on the use of recognizable flagship species to rally people to their cause. The preciousness of the tamarin’s gremlin-like face and its bouncing energy make it a great animal ambassador for the Atlantic Forest (as compared to, say, the three-toed sloth, Bradypus torquatus, that shares the same habitat and precarious conservation status but hardly moves and is draped in lank, lichen-encrusted fur; or the endemic spiny rat, Trinomys eliasi, which is, well, a rat.) The tamarin’s sense of commonness in its native land lends the symbol a degree of integrity; the tamarin is truly emblematic of a certain Brazilian habitat. The forest without them is like Central Park without squirrels. In a recent novel about the first reintroduction of captive
born tamarins, written by one of the founding scientists of the project, a Brazilian field assistant explains his interest in working with the AMLD. “The golden lion tamarins are the heart of Brazil. They don’t live in any other country in the whole world. And they are so human-like, living in families with everybody helping to raise the babies. They’re like my family” (Beck 2013:Highlight Loc 1482-1484). Though fictional, the speech captures the very real sense of genuine relatability inspired by the tamarin and the sense of ownership and local pride felt by people of the region who have come to know that this is “their” monkey.

In Beck’s novel, a wealthy landowner is pleased to preserve part of his land as an RPPN and partner with the AMLD to host reintroduced tamarins on his property. Such a partnership could lead to the development of an ecotourism enterprise, allowing tourists (who, as described above, cannot enter government reserves) to see the animals. Love of tamarins combines local pride with business acumen. This combination exists outside of the novel as well. I went with Alex and Vinícius to visit a large property whose owner was very interested in developing an ecotourism center. He walked the AMLD team through an elaborate plan for a little commercial center to sell handicrafts and classroom space to screen environmental films for children. He already had a lovely social area with wooden benches and tables, couches, a hammock, and a small but beautiful kitchen. The main entrance was carved with a forest scene inhabited by golden lion tamarins. Can’t the AMLD just toss a few micos into his forest? He described the forested area as large and in great condition; little monkeys would really attract people. He was not the first landowner to realize that tamarins would be a great asset to this sort of project, but Alex patiently explained that they really cannot release micos just anywhere. The man good naturedly suggested that some of the rules the team explained to him were foolish, but he seemed disappointed that he would not get colorful, charismatic monkeys added to his woods.
Geographer Jamie Lorimer elaborates the unique characteristics of nonhuman charisma, dividing charisma into three types: ecological, aesthetic, and corporeal. Nonhuman charisma is founded in the ecological, “the concurrence of its ecological rhythms with those of humans” (Lorimer 2007:917). Aesthetic charisma encompasses the emotive “cuddly” or “cute” characteristics “encountered visually by an observer either in the flesh or as a textual inscription” (Lorimer 2007:918). The final type, corporeal, “refers to the affections and emotions engendered by different organisms in their practical interactions with humans” (Lorimer 2007:921). This last type of charisma is largely experienced by scientists or amateur naturalists as they interact with their species of observation. Golden lion tamarins possess all of these types of charisma. Their ethological properties – mammalian, diurnal, care for young, use vocalizations for communication – make them easily comparable to human beings. They are, indeed, cute and able to capitalize on anthropomorphism, be that a boon or a detriment (see Cronon 1995:82 and Simberloff 1998 for critiques of anthropomorphism and single-species focused conservation). Finally, and perhaps most interestingly, the researchers who work with these animals have an unquestionable bond with the tamarins. These interactions, explored in more depth in chapter 5,
reveal that “conservation science is as emotionally charged as any other practical arena of everyday life” (Lorimer 2007:922). Visceral connection to the natural world is hardly a new phenomenon. Eighteenth century views of nature in the United States were characterized by emotional reactions to “sublime” landscapes (Cronon 1995:73). But animal ambassadors put a very literal face to conservation, soliciting a sense of connection, in this case, not just between a majestic, but ultimately faceless, Atlantic Forest, but between humans and a very rare, very needy, creature.

The sense of urgency encourages emotionally charged conservation, a “politics of endangerment” (Choy 2011), or, put differently, “an anticipatory nostalgia” (Choy 2011:Highlight Loc. 552-53) for a future forest conspicuously empty of this highly recognizable and defining (animal) species. I return again to the comparison with squirrels. Imagine Prospect Park in Brooklyn, for example, emptied of squirrels. Stripped of one of its most quotidian features, this familiar landscape is still recognizable, but as the absence becomes gradually more apparent, the park loses some of its charm because now, more than a landscape of existing features, it is a mausoleum to what used to exist.

The absence of squirrels is so wholly unimaginable that perhaps another example is required. On a warm night, I stood outside my mother’s house in Connecticut after dark and noticed the gentle glow of a firefly. The one light made me suddenly aware of the darkness around the single bug, the blankness of the yard that, were it the yard of my childhood, would have glinted with numerous little twinkles. I cannot remember when I last saw more than a handful of fireflies at once. Firefly populations have declined in recent years. I remember their presence as amusing but ultimately unremarkable. In contrast, their absence is deeply meaningful and reflective of larger problems of urban development, pesticide use, and light
pollution. Firefly absence inspires nostalgia for times past and, should the downward trend in their population continue to the point of extinction, evoke an ultimately “impotent regret” (Ritvo 2004:210) for an animal lost before conservation efforts could be mobilized.

Fireflies are found all over the world (there are thousands of different species, but for the average, casual observer a bioluminescent beetle is a firefly, with no further distinction.) *Micos,* understood by the average viewer as the whole mass of marmosets and tamarins, might be common, but for conservationists in the know, the golden lion tamarin is made more valuable and effective as a representative species by nature of its status as endemic: not only is the animal personable and rare, it is also dependent on an incredibly specific, geographically bounded, range (Hall et al. 2008:76; Lowe 2006:33; Vivanco 2001:84). Indeed, “everything hinges on endemism in the politics of endangerment” (Choy 2011: Highlight Loc. 440-43); the conservation of the golden lion tamarin must happen here or not at all. Now that environmental education efforts have increased local understanding of the GLT’s plight, the human community of the *baixada litorânea* cannot suggest that all this fuss over species and habitat conservation be taken up in some other part of the country. I think here of the contrast with wolves in the United States, for example, where the conservation status varies from one state to another, leaving room for the argument that if the animal should be saved it should be saved elsewhere. Ranchers in Montana, worried over the fate of their livestock might support the idea of wolf conservation in Wyoming, the farmers of Wyoming preferring the idea of conservation in Montana.

**Shifting Perspectives**

Even with the advantage of charisma and rarity, like any symbol, the tamarins cannot possibly tell the whole story – they quite literally stand for something more, something larger.
The population has been saved, pulled back from the yawning abyss of extinction. The population is healthy and stable, but now there is nowhere to put all of these bouncing golden monkeys. The AMLD’s goal is “atingir uma população mínima viável de 2,000 micos-leões-dourados vivendo livremente em 25,000 hectares de florestas protegidas” [to reach a viable population of 2,000 golden lion tamarins living freely in 25,000 hectares of protected forest] by 2025. These numbers represent the estimate of what it will take for the GLT to exist stably, unaided, in the wild. Although today approximately 1,700 tamarins are living in the wild, this population is highly fragmented. Many family groups of 5-8 individuals live on island patches of forest, unable to interact (socially and, more importantly, genetically) with the other GLT groups. In response to this problem, breeding and tamarin ecology research now share the spotlight with forest restoration, including a strategic effort to connect fragmented forest habitat.

The organization adjusted its mission statement in the last few years to specify “25,000 hectares of protected and connected habitat” (emphasis added) thus increasing the institutional focus on the section of the AMLD devoted to the program of creating forest corridors.73

The AMLD staff used to think about discrete tamarin families, residents of one or another plantation or forest patch, but “sustainability cannot be conceived in terms of patches or singular activities” (Heller and Escobar 2003:161). Now the AMLD staff places a new emphasis on the tamarin “metapopulation.”74 The relationships between individual tamarins within a family or immediately adjacent families are still important, but the AMLD has its eye on the broad view: how the seven major regions of tamarins (see map below, each region comprised of a number of families in connected, or almost connected, forest) will one day seamlessly link to one another, creating a self-sustaining population of primates.
Strategic relationships with landowners and local communities come into play as the AMLD team pores over satellite maps with little dots representing known GLT populations and discusses the best possibilities for linking the most number of tamarins together. As a result of their efforts, they hope that one day the population can maintain itself without so much human intervention. In this most loving game of chess, the team must not only strategically connect forest and monitor tamarin families, they are also is interested in outreach, in teaching people how to farm responsibly and to respect the Atlantic Forest habitat that surrounds all living in this region. There is more at stake than whether or not people like the golden lion tamarin, whether they appreciate trees or fresh air.

The campaign to protect this animal and to value its place in the modern and modernizing Brazilian state challenges people to resituate themselves as characters in a vast ecological web, rooted in geological time and responsive to a supporting cast of flora and fauna more typically thought of as cute animals, pests, or merely ignorable extras in the background. In order to co-exist, the tamarin, by the same token, must exist within the realities of Brazil’s social history and present. Habitat for the rare animal species of this region is at a premium. Nothing but an expanded, connected range will make the Atlantic Forest self-sustaining and safe. A protected,
self-sustaining forest is not the same thing as a sustainably protected forest. The former is a model familiar in North America where a National Park system sets aside and protects select areas, preserving them from human usage. The latter however, speaks to the reality of life in the state of Rio de Janeiro, a highly populated region of the country with numerous small farmers. The Atlantic Forest cannot be set aside for the exclusive use of plants and animals. Too many people live here, too many livelihoods depend on the land. The reality of Brazilian social history collides with the conservationists’ dream of a connected and protected forest large enough to permanently hoist the GLT out of harm’s way. For conservation to last here, the needs of flora and fauna, of national law, of international expectation, all must coexist in relative harmony in a geographically small and (often) socially fractured space.

“Massacre of the Bananas”

The final section of this chapter analyzes a letter sent to the AMLD in the late 1980s. A close reading of the letter offers insight into themes of law, citizenship, and the unclear place of the tamarin in this socio-political landscape. It reflects a peculiar tension, not of violence (the author is angry, but as mentioned earlier, this region is free of the violent conflict and bloodshed that can surround conservation projects), not even a tension between human and animal, but rather divisions in the understanding of humans’ and animals’ places in geographical, historical, and national landscapes. The first two sections of this chapter examined the place of the tamarin in realms where their role is fairly clear: their evolutionary history, their Atlantic forest habitat, in conservation research, and in popular imagination as a cute, almost whimsical, creature. But in order to exist side by side with human settlement, on land protected by human law, the tamarin inevitably enters into human political history, where its standing is not as clear.
Historian Harriet Ritvo, in her discussion of the increased scholarly interest in animals in recent decades, points to the potential for “new relationships between scholars and their subjects, and new understandings of the role of animals in the past and at present” (Ritvo 2007). Animals have a way of drawing out questions of rights and citizenship, of inserting themselves unexpectedly into hierarchies and conversations. As Ritvo notes, “the standing of animals, even those closest to us, still presents vexed moral, legal, and political issues” (Ritvo 2007). I will discuss this “animal turn,” or the importance of non-human “socionatural actors” (Mathews 2011), in the politics of land and conservation at Poço das Antas in this section through a close reading of a letter complaining about marauding tamarin groups wrecking a banana grove on a property neighboring the biological reserve.

In 1988 the Tamarin Association received a letter that began, “Senhor Responsável Pela Reserva: acabamos de ser informados que micos leão da reserva atacaram bananal em nossa propriedade” [Sir in Charge of the Reserve: We have just been informed that lion tamarins from the reserve attacked the banana grove on our property.] The letter, tucked into a plastic accordion folder of the AMLD archive with a tongue-in-cheek note labeling it the “massacre of the bananas,” goes on to detail the “attack” and request remuneration from the AMLD for the resulting loss of income. While of course it is not completely clear that the animals actually came from the reserve, nor whether the group in charge of the conservation of the species should be responsible for all actions attributed to members of the species – problems encountered by other conservation projects as well (Vivanco 2006:82, for example) – the writer is emphatic that the AMLD reimburse him for his loss and offers suggestions of how they can prevent this unfortunate incidence from recurring.
Setting aside the question of accountability, the reaction of the landowner to this event is fascinating and speaks to the complexities of both the Brazilian concept of law and property as well as the broader question of rights (and responsibilities) of animals and the human beings who envision a future of co-existing species.

**Tamarins and the law**

Early in the letter, the author makes reference to the law, the constitutional right to public property. He notes that “legislação específica” [specific legislation] delimits the area of the reserve to prevent just this sort of trouble with neighboring properties. Far more interesting than the author’s obvious desire for the tamarins to be good neighbors and keep to themselves is the rhetorical strategy of invoking this kind of vague legalese. He goes on: the final paragraph of the note remarks that a copy of the letter is being sent on to the Instituto Brasileiro de Desenvolvimento Florestal (Brazilian Institute for Forestry Development, IBDF, which became IBAMA in 1989) “para garantia de nossos direitos constitutionais” [as a guarantee our constitutional rights.] A monkey stole a banana and so he invokes the Brazilian constitution and government? The legal climate of Brazilian land claims gives the letter’s author very good reasons for taking this step.

In the history of land and law in Brazil, extra-legal threats to land possession are very real, and references to legal statutes and documents, whether fabricated or not, are part of complex and effective strategies both for maintaining and usurping land holdings (see Holston 1991, also Hull 2008 for a similar discussion of document manipulation in Pakistan). The “understanding of law as a strategic resource” (Holston 1991:705) allows for accumulations of official-looking documents to support contradictory histories of land ownership and rewards
persistence. 78 Within this tradition, whatever the legal status of the land at the moment, property is under constant threat from squatters, forgers, and creative historians. 79 Professionals emerged in the art of grilagem (the forging, aging, and otherwise manipulating of documents to fabricate land claims) and as a result “every hectare might have several illegitimate yet insistent pretendants” (Dean 1995:215). In The Violent Land, Brazilian novelist Jorge Amado chronicles the bloody conflicts in the backwoods of Bahia over prime cacao lands in the early 20th century. Landowners paired the violence of guns and machetes with sly legal maneuvers by which “men who for years had owned land and plantations would lose them overnight, thanks to a well-drawn ‘ouster’” (Amado 2013 [1945]:153). Cunning lawyers orchestrated “ousters” by doctoring surveys and bribing judges. Amado’s tale describes coroneis (colonels, plantation owners) who killed lawyers and set fire to registry offices, the bureaucratic violence that threatened their land holdings met with corporeal violence. Still, lawyers were indispensable to the colonels. In Bahia, a young lawyer learned “a thorough knowledge of the law and of the methods of making a farce of it” (Amado 2013 [1945]:271), and maintaining claims to property required the farcical legal dance as well as physical control of the land.

The Poço das Antas Reserve itself was once a private property; 80 the invasion of the golden lion tamarins might very well be the opening salvo of a battle for possession of the lands peripheral to the reserve. Forest reserves can, and do, grow. Poço das Antas expanded once in the mid–1970s (Rylands et al. 2002:14), and, as noted in the Prologue, the neighboring União reserve is undergoing an expansion as well. Brazilian land law allows for a natural route from illegal possession to legal property; the banana letter reflects not only a concern over a number of kilos of lost product but also a keenly felt anxiety over the fungibility of land ownership.
Additionally, the question of whether or not the land is “productive” has a serious impact on ownership. Conditional ownership based on “improvement” of the land dates back to Portuguese *sesmarias* (colonial land grants.) The Portuguese Crown, lacking the resources to control the entirety of its new territory, gave other nobles the rights, and responsibilities, to sections of Brazil. Ownership came with the caveat of investment, and de facto ownership had more to do with power than paperwork. For the most part, this informal system satisfied landowners; many “preferred uncertainty, the better to encroach upon public lands” (Dean 1995:148). The government vindicated the squatters in 1822 when it dispensed with the *sesmaria* system and instead “instituted the recognition of titleless holdings if squatters could establish proof of effective cultivation” (Stein 1985:13). Politician José Bonifácio de Andrada e Silva made the additional, unpopular suggestion that undeveloped land grants return to the control of the state (Viotti da Costa 2000:43), but this reform would have interfered with the monopoly on property of the powerful landholding elite and was not implemented.

Landowners often favored eschewing the bureaucratic process of legal ownership in favor of exerting control over the land that they claimed. During the 19th century, “planters put a premium on the *effect* as opposed to the *fact* of property ownership” (Rogers 2010:49), and fraudulent claims to public lands were rampant. This tradition continues in 20th century legal cases in which the courts did not attempt to authenticate title documents presented as evidence, but rather focused on evaluating the economic activities occurring on the land in question (Brannstrom 2001:864). Claim to legal ownership by way of title and other documentation are not alone sufficient to secure continued recognition of ownership, control and possession of land are tied to labor and productivity (Rogers 2010:5). The banana letter makes note of the fact that “somos agricultores e estamos formando mudas de banana prata para um grande bananal” [we...
are farmers growing seedlings for a large plantation. The author strategically points to the productive nature of the work disrupted by the tamarins, “emphasizing land uses as proof of land possession” (Brannstrom 2001:866). Far from an obscure law from the colonial era, land productivity remains an important qualifier for legitimate possession; the Constitution of 1988 “reiterated the requirement that land must meet its social function in order to ensure title” (Simmons et al. 2007:579). The writer of the letter to the AMLD quite deftly addresses the multi-layered argument necessary to maintain continued claim of the land currently in his possession in the face of the ambiguous assertions of the tamarins to the same territory.

**Sharing space**

More than just trespassing on the landholding of a neighboring farmer, the tamarins have wandered onto a highly contested literal and figurative field. Do wild animals really have a place in an increasingly populated human domain? Neither the AMLD nor the tamarins can simply ask the majority of Brazil’s human population to kindly remove itself from the coast of the country and let the forest and its non-human residents reclaim this territory. If the tamarins are going to survive here they must live peacefully beside their human cousins.

With so little Atlantic Forest remaining, forest restoration of cleared areas is a key part of the strategy of providing the tamarins with the protected and connected habitat they need to survive. Alex, the forest engineer introduced in chapter 2, talked about the equilibrium of the ecosystem, but his equilibrium is the balance of nitrogen and calcium in the soil, a good mix of plant species. Where do humans appear in the plan to rescue the Atlantic Forest, as represented by the charismatic GLT? As Paige West points out, “much conservation seems to stem from this kind of individual attraction to a particular species.” But she goes on to caution that “this sort of
separation of one of the constitutive parts of a natural system from that system, and its subsequent treatment as a kind of ecofetish, is a key component in both the commodification of nature and in reconfiguring the environment in ways to extract it from social relations of exchange” (West 2006:133) with the local people. The people, subsequently, disappear from view. Though human beings may not be the first animal to come to mind for a list of Atlantic Forest residents, they are in fact the major player in this ecosystem. We drastically oversimplify and dangerously misunderstand the challenges of conservation in the region when we edit out human presence.

In Casimiro de Abreu and Silva Jardim, where most of the remaining tamarins live, farming is an important activity. Both large plantations and smaller subsistence plots dot the landscape. At the community meeting in Carangola to discuss the expansion of the União biological reserve (described in the prologue) one resident pointed out that the big problem is that the bichos (animals), do not understand boundaries. If they see fruit, they take the fruit. If there is no fruit in the forest, they will come onto the properties of the farmers, and more forest encroaching on the community means that the animals will be closer as well. Another resident went on to remind the government representatives about the disastrous Carangola fish pond project. The big question here was, who would be responsible if things went wrong? The fish pond incident had made the community understandably incredulous about the government’s willingness to take responsibility for their own projects. If the animals did run onto their land, what could the residents do? Would the reserve take responsibility for lost crops? “Tira da brincadeira e fala em seria” [stop joking around and be serious] responded, the reserve employee. But the community was serious. When he realized this, he noncommittally shrugged, “você tem direito a plantar e o bicho tem direito a ficar vivo” [you have a right to plant and the animal has a
right to live.] He went on to reassure the community that there had never been any problems with the monkeys at Poço das Antas, so no one need worry.

~ ~ ~ ~

The banana letter is an important reminder that in order to succeed, the effort to conserve the golden lion tamarin must incorporate a reasonable plan for peaceful interaction between the two primate species; people, in this case most likely farmers, will have to be taught how to live, and cultivate, alongside micos. For large scale land owners this process will involve encouragement to consider creating RPPNs and allowing forest corridors to be planted on their properties, which will aid the effort to link together the fragmented Atlantic Forest habitat. However, nearly 85% of agriculture in Brazil is comprised of family farms (Brumer 2008:19), and many of those, like the community of Carangola, are modest parcels of land acquired as part of the agrarian reform movement that began in the last decades of the 20th century. These small farmers, badgered by complex bureaucracies, frequently derided by the ruling classes, and living season to season from their tiny lots are also excited and exciting partners in conservation. The following chapter explores how, despite the impediments, they are bravely setting off down relatively uncharted territory towards greener, forested agriculture.
CHAPTER 4, Agriculture in the politics of land and conservation

Agriculture will save us. Though a stunning number of people echoed this sentiment, I heard it first from a man whose voice proved dissonant with all the others (including my own) in all other things. Seu Vigier comes from a wealthy family with deep roots in the region. His ancestor was instrumental in bringing hundreds of Swiss colonists to the serra (mountain) region just west of Casimiro de Abreu. Though the immigrants struggled when they arrived in Brazil, and the project of bringing them over suffered from mismanagement and false promises, the Novo Friburgo municipality in the highlands bordering Casimiro de Abreu to the northwest still shows strong European ancestry, and the people have a powerful sense of identity of themselves as Swiss and German descendants. Vigier’s appreciation of the positive effects of agriculture is similarly resonant of European historical ancestry. In an analysis of the travel narratives of Swiss envoy Johann Jakob von Tschudi in the mid–1800s, Brazilian historian Regina Horta Duarte suggests, “in his eyes, the tropical forest appeared as a collection of absences, of which the most serious was the lack of agriculture” (Duarte 2004:46). Tschudi was not the only continental visitor to suggest that the wild savagery of the tropics contrasted sharply (and perhaps poorly) with the firm and orderly European customs. Humboldt and Aimé Bonpland, whose “historical journey, and the monument of print it produced, laid down the lines for the ideological reinvention of South America” (Pratt 1992:112) in the 19th century, recounted tales of spectacular and exotic nature that they, rational natural scientists, sought to imbue with order and meaning through categorization. In the early 20th century Brazilian novelist Jorge Amado described the Atlantic Forest of the northeast, before rugged and daring men began to clear it for cacao plantations, as a dark and enigmatic place. “Here everything was reminiscent of the
beginning of the world. Impenetrable and mysterious, ancient as time itself and young as spring, the forest appeared to the eyes of men as the most formidable of ghostly habitations” (Amado 2008 [1945]:36). Agriculture, as code for discipline and order, and productivity, as defined by European sensibility, was complicit in the process of colonization, of transforming the “impenetrable” wilderness into something more familiar to the colonizers.85

Seu Vigier spent a couple of hours with me, talking while driving me around various points of interest based on my stated desire to understand more about agriculture in Casimiro. His tirade against the local agrarian reform movement opened with the distracting qualifier that, “it’s not a race thing, but…” I found myself agitated by this casual remark and struggled to listen to him continue to talk.86 It was only later, as I sifted more carefully through my notes, that I realized that despite his hurling invective at the absurdity of asking individuals to preserve forest on their properties, the out of date environmental laws, and the general lack of enterprise that characterized the (coincidentally?) Afro-descendent population, Vigier felt that the earth’s natural resources were safest in the hands of farmers. “What, do you think the petroleum people are going to save them?” he asked rhetorically,87 the environmentalists already dismissed as misguided and out of touch.88

No, agriculture was the answer to the environmental concerns of the region. It was a surprisingly sophisticated analysis, especially since it proved to be so widely and diversely understood. Though his idea of the best kind of agriculture differed quite substantially from what I came to appreciate as ecologically and socially sound practice, it was nonetheless a revelation to think that perhaps popular understandings of conservation (biologists spending quiet hours in the woods observing plants and animals, educators in zoos teaching children to recycle and save water, media campaigns against littering) lacked a critical connection to
everyday environments that people actually inhabit (Cronon 1995). In other words, “conservation” cannot be cordonned off entirely from other ways that people interact with the land if we expect to be able to eat.89 

Agriculture in Brazil is distinct from agriculture in the United States. Though both countries have massive agro-industries, Brazil also has a sizeable peasant class eking out a living on plots of land as small as a few hectares (one hectare is roughly the size of a regulation soccer field.) Numerous historical circumstances feed this gap, including a brutal plantation culture, slavery that lasted longer than anywhere else in the Western Hemisphere, persistent cronyism, a cultural denial of the existence of racism, and a political atmosphere hostile to land reform. Earlier chapters have already explored some of these tangled threads of Brazil’s agricultural context. Simply put, Brazil is a land of deep disparities between the wealthiest citizens and the much larger lower class. A slight, but growing, middle class separates the two. Still, Brazil’s GINI index is in the low 50s, putting it on par with smaller Latin American countries like Guatemala and Paraguay. The disparity includes land ownership, with 2-3% of the population controlling more than 50% of the country’s arable land.

It is not uncommon for the few elite to pass down their lands through the generations. Eventually, many landowners moved away to urban centers of the country, having little to no contact with their lands, which they left in the care of managers. At the same, after slavery finally ended at the end of the 19th century, former slaves found their lives did not change substantially. With no means to gain land for themselves, they remained on the large plantations and, not without bitterness, continued to work at the pleasure of the landowner (Stein 1985:57) who often would only allow them to plant certain, subsistence crops (Wolford 2010:187). Land inequality persists into the present. In southern Brazil in the 1908s, discontent with the glaring
disparities between the landed class and the impoverished gave rise to a social movement that has since grown to have incredible national and international influence. The method of the *Movimento Sem Terra* (Landless Workers Movement, MST) was simple: a collective of families would take over large tracts of unused land. They would pitch tents, farm, work together to create community schools, and pressure the Brazilian government to recognize their right to keep the property that they had transformed into productive farmland.\textsuperscript{90} This process can include lengthy legal negotiations as the landowner can fight the occupation, and even if the owner acquiesces, the government must buy the occupied land from the landowner before giving it over to the would-be settlers.

Land occupations generally occur at night to avoid confrontation with either government officials or the landowners themselves (Wolford 2010:1), but the movement can still elicit violent response in some instances. Clashes have occurred between large landholders, MST settlers, and police, heightening and bringing to the fore the class tensions that churn below the surface of Brazilian social politics. The persistent frustrations of the landless can inspire militant activism within the movement. Often more people will camp out at a site than could be supported by the land. In order to decide who gets assigned a lot, “squatters are ranked according to criteria such as marital status, age, and previous occupation” (Wolford 2010:49), and based on the criteria, young men are among the last to receive land. After repeated denials, these young men “will often decide to join the movement as activists” (Wolford 2010:49). MST activists have succeeded in garnering national and international support as well as gaining legal titles for some of the encampments. The movement represents an important part of the country’s move towards agrarian reform and the slow but necessary adjustment of the massive economic inequalities that plague this emerging world power (for a detailed history of the MST see Wright...
and Wolford 2003). Although Vigier was the first person at my field site to point towards the importance of local agriculture, when he suggested that “agriculture will save us” the farming he described evoked the agriculture, and the social structure, of the previous century. On the other hand, the participants of the agrarian reform movement who I met later, shared sentiments and visions for agriculture that spoke to the entwined needs of a more equitable and environmentally sound society.

**Agrarian reform in tamarin country**

Impositions of European ideals of order were not limited to Latin America, and in the 20th century these ideals were expressed through conservation initiatives as well as through agriculture. In Madagascar, “forest conservation was imposed on Malagasy farmers by the French as a form of land use discipline that would realize the full market potential of natural resources and slow the process of land degradation” (Sodikoff 2004:375). Sodikoff describes the imposition of “conjoined environmental and labor regimes” (Sodikoff 2004:375), making the point that conservation is not just about preserving resources but also about privileging kinds of work and land use. Even at a time when conservation worldwide moves away from coercive methods (such as forcing people off of environmentally valuable lands or criminalizing traditional farming practices that do not align with conservation ethics, as has occurred around national parks in the American West) and towards community participation, speaking for the case in Tanzania, Neumann suggests “that violence against people is inherent and perpetually latent in the practice of state-directed wildlife conservation” (Neumann 2001:306). Neumann traces the cause of this violence not only to the common possession of arms (for hunting and protection) in Africa and the remoteness of many wildlife preserves, but also to the historical
pattern of displacement, “a population’s loss of rights of access to land and natural resources” (Neumann 2001:308), of local people by the state to make way for wildlife conservation.

Although agrarian populations in Casimiro have not been evicted from their land as have groups in Tanzania, in rural southeastern Brazil agriculture and conservation share a complex history of land ownership and access (discussed in chapters 2 and 3), and it is impossible to think about the future of the land use in the region without considering conservation and agriculture side by side. “Fallow” or “underused” land is a contested space that appeals to both conservationists and to the large numbers of landless or land poor citizens of the country. The study of political ecology, as Anna Tsing points out, “reminds us that human interactions with the environment respond to social conventions and political coercions” (Tsing 2004:173). Land conflict is often attributed to a scarcity of land, but political and cultural struggles might construct the perceived scarcity (Bobrow-Strain 2001) such as in the case of Brazil’s history of extremely uneven distribution of resources. Four agrarian reform settlements surround the Poço das Antas Biological Reserve and the Golden Lion Tamarin Association (AMLD) based there. At the time of my fieldwork, three of them consistently participated in the burgeoning local movement to incorporate conservation practices into small scale agricultural operations.91

Quete has the longest history with the AMLD despite being the farthest away. After a year of MST occupation, the site became an assentamento (a legally sanctioned agrarian reform community) in the early 1990s when the government acquired the land and distributed plots of averaging fourteen hectares each (including legally restricted forested sections) to 104 families.92 The community meeting described in the introductory chapter took place in Carangola, on the other side of the highway and abutting the other major biological reserve, União. No one ever camped out in Carangola, the people living there were settled on their plots, also around fourteen
hectares apiece, from other places (INCRA 2012). Recently, the residents have had some trouble with the government: some people were selling their plots of a land, a practice strictly prohibited within assentamento communities. The AMLD presence in Carangola is minimal, but agricultural extension workers from a government-contracted NGO called CEDRO hold frequent technical assistance workshops in the community and numerous community members are actively involved in the agroecology movement. Seu Jovelino, the concerned man at the community meeting described in the prologue, was even featured in a documentary film produced by a local university about agroecology in Rio de Janeiro state. The video highlighted Jovelino’s agroforestry system (SAF), showing how smoothly he integrated forest cover and agricultural production on his plot of land.

Finally, Autaz-Mirim borders the southern edge of the reserve and is separated from Poço das Antas by a little creek. The acampamento (encampment) started here in 1996. By 1998, a small part of the community became an assentamento. Though many residents in the other half have invested in homes, pastures, agriculture, and other improvements to the land over the last decades, these people of Autaz-Mirim are still technically acampados (camped out) and thus ineligible for government technical assistance, such as those offered by CEDRO. The AMLD was once involved in Mirim, but the internal politics of the community proved difficult to manage. Still, some farmers feel committed enough to sustainable farming practices to maintain their connection to the burgeoning agroecology movement that ties in with the overall vision of conservation for the region. Despite the ever- looming threat of eviction, a number of farmers in Autaz-Mirim put a great deal of time and effort into creating agroforestry systems and other ecologically beneficial farming practices. It struck me as admirably brave and fore-sighted to invest themselves so heavily in ecologically beneficial practices. These were not venture
capitalist making daring investments but small farmers putting everything they had into land to which, for a number of reasons and technicalities, the government denied them legal right.

All three communities offer an impressive vision of conservation at work. Granted there are some immediate benefits to going along with ecologically responsible farming practices – the technical assistance of the local NGOs, avoiding costly chemical fertilizers – but it is also profoundly risky, labor intensive, and as yet un-vetted by the cultural familiarity that can make traditional agriculture more appealing. The people in these communities are not experimenting with little kitchen gardens. Their minimal plots of land are what they have to live on. Derided by other parts of society as backwards, ignorant, or lazy, the assentados and acampados around the Poço das Antas reserve are incredibly wise to the short-term effects on their health of eliminating their use of agricultural chemicals, the long term effects on the ecosystem of shade growing techniques and cultivating native plants, and the global reverberations of ecologically responsible agriculture. They are at the vanguard of a powerful transformation in the way that people understand their relationship with and place in the natural world.

Conservation can seem out of date, or at least like an exclusive practice, available only to upper middle-class North Americans who buy Rainforest Alliance approved coffee at their local Whole Foods. However, beyond and between the biomes, waterways, flora, and fauna lives the world’s human population, too often excluded inelegantly from the pristine construct of “nature” (Cronon 1995; Simberloff 1998:252; see also Heller and Escobar 2003 for a discussion of the link between social movements and the concept of humans embedded in nature). The agroecology movement serves as an emerging counterweight to this stiff dichotomy of man versus nature, a way of including the human population in conservation practice. For example, forest restoration projects, like those discussed in chapter 2, require the support of the local
community to succeed (Temperton 2007:345). Combining ecologically responsible agriculture with a focus on local participation, agroecology is tuned in with environmentalism as well as the Brazilian agrarian reform movement and the growing global concern with the sources and quality of food and the well-being of those who produce it. The farmers involved in the agroforestry movement living in the three reform settlements surrounding Poço das Antas would not necessarily describe themselves as environmentalists, nor is the state of nature always the first of their explicit concerns. But it is no accident that inspires numerous people, from municipal workers to non-profit employees to wealthy landlords, to give me variations on the same sentiment: agriculture will save us.

This places the farmer in an interesting position, perched between the land and the increasingly technologically advanced, yet still biological and nutrient hungry, human population. Farmers understand where food and other natural products come from in a way that many of the rest of us can overlook should we so choose. Their basic physical proximity to the land is coupled with economic proximity, the latter heightened for those living in agrarian reform settlements. Above and beyond the usual strains of small family and subsistence farming throughout the world, the laws of agrarian reform here in Brazil suggest that most of the family income be generated from the land, employment in a nearby town or city cannot be counted on to safeguard against a lackluster crop or an environmental misfortune. The idea behind this rule, as well as other statutes restricting the sale and division of government granted plots, is that agrarian reform does not serve the whim of people who fantasize about free land or real estate speculation. Rather, it is a concerted national effort to redistribute fallow land to those who would use it productively to grow crops and support themselves. A noble aim to be sure, but the reality of farming in an agrarian reform settlement, regardless of the industrious intentions of the
residents, is often one of poor soil, little technical support, and lack of capital to purchase basic tools. The national agroecology movement seeks to address these difficulties both by providing technical support and instruction in sustainable, environmentally friendly agriculture as well as aligning itself with the MST, which demands a political voice for the un-landed peasant class. Agroecology envisions ecologically and socially sustainable agriculture, thus also enforcing the connection between the environmental movement and the demand for social justice.

Agriculture itself has many manifestations. Seu Vigier’s world is populated by large plantations owned by hereditary proprietors who often live in the city of Rio and delegate the task of running the property entirely to managers. Though he has nothing nice to say about the denizens of agrarian reform settlements or their work ethic, agrarian reform is an important movement in Brazil. Brazil ranks high in global land inequality. Huge plantations hire a minimum number of employees to produce mega-crops of soy or sugar, encouraging a large population of poor, dispossessed people in rural communities. Many of them migrate to cities in hope of finding work and the sprawling favelas (slums) of metropolises like São Paulo and Rio de Janeiro grow glutted with impoverished, jobless, low-skilled people.

Agrarian reform promises to keep many people in rural areas, even attracting some city folk with dreams of getting away from the crime, pollution, and competition of the urban centers. Gerson, former president of Quete’s community residents' association and a close friend to the AMLD for many years, was once a truck driver but now operates the community’s only plant nursery. His plot of land contains greenhouses where he raises native plant species to sell as well as maintains a successful SAF of his own. As part of the agrarian reform process, families receive very modest plots of land on which to maintain a small farming operation for subsistence and sale, primarily directly to consumers through local markets. Small farming communities
emerge and, theoretically at least, feature health posts and community schools for the local children. Unlike share-croppers or itinerate farm laborers, the struggle of the *assentados* is more long term, more intense, more personal.

The idea of efficient agriculture is one that Seu Vigier admires. I can understand how efficiency can be ascribed a positive value. But the operation of a large plantation is only “efficient” in so far as it brings the most profit to its single proprietor in a given season. The soil might be used to the max, leaving little for future years; laborers are not permanent or individually valuable so at the end of the season they are released into society to hunt again for work; pesticides and chemical fertilizers increase the immediate yield while poisoning local waterways; monocultures strip the natural balance of the soil. The small family farmers involved in agroecology are, of necessity, more committed to the long term health and productivity of the land. They are the agriculturalists who will save us, the ones who will provide models of how to extract the necessary calories and nutrients from the earth without polluting the environment irreparably. In the rural setting, where people live and work the land, an ethic focused on conscientious as well as healthful agriculture is of heightened importance. If our aim is conserving forests, water, endemic animal species, among other missives of the natural world while also continuing to live on this planet there is no choice but to address the needs of both human and non-human nature. Though I’m sure this was not Seu Vigier’s intention, he has hit upon a clever observation about this problem: agriculture may very well save us, resolving both entwined problems of environmental conservation and feeding the human population through a long-term retrenching of the way people in the region interact with the surrounding environment.

**Teaching conservation**
**Mini-curso (mini-course)**

Carol and Davi are agricultural extension workers. Holding degrees in biology and agricultural sciences respectively, their job is to provide technical assistance to farmers. He is employed by the AMLD and she by CEDRO, the local non-profit that the government has contracted to provide technical assistance to the *assentamento* communities in the region. They are young and passionate about working in rural communities, and one April morning they organized a meeting at the community center in Quete. Davi and I arrived a little after 9:00 a.m. Community members began trickling in shortly thereafter, but Carol was still missing. “Não sei esperar,” [I don’t know how to wait] said Teixerinho, a gruff curmudgeon who is nonetheless very active within the community’s agroforestry movement. He stomped off to his lot across from the community center to mow his field while the rest of us waited outside the little community center building. Shortly before 10:00 a.m., Carol’s colleague finally dropped her off then continued on in CEDRO’s single, decrepit vehicle to do other business around Quete. “Bom dia” [Good morning], she greeted us, breathless. “Boa tarde!” [Good afternoon] the crowd responded good-naturedly. We entered the building and discovered there were only three chairs. While we puttered about in some confusion (“as cadeiras são presas na cozinha” [the chairs are prisoners in the kitchen] offered one woman, gesturing to a locked door), Teixerinho materialized with a collection of chairs and stools from his house. The workshop commenced.

![Figure 14. Community workshop](image-url)
Carol and Davi had organized this meeting to discuss how the community approaches and defines conservation as well as to go over the dense directives of Brazilian environmental law. One middle-aged woman, Joana, seems to have the latter more in mind as she settles into her chair and casually queries the group as to whether or not she is allowed to mow under the trees of the forest on her property. Wasps circulated the small room, moving to and from their nest in the florescent light fixture in the middle of the room, as Carol spread a large piece of butcher paper onto the floor in front of the circle of rickety wooden chairs. With a fat marker in hand she asked, what does protecting the environment mean to you? It was a funny question because, more often than not, the desired response is not a personal reflection on the nature of an individual’s relationship with the world around them, but rather a register of conservation’s talking points about its own importance. In other words, this was a pedagogical exercise, an opportunity for Carol and Davi to present “correct” or “proper” valuations of nature (Collins 2008:304), rather than a means to understand the varied understandings of conservation existing within the community. True to form, someone offered “protecting animals.” The farmers of this community were well apprised of environmentalism’s general call to safeguard the threatened species of the world, the golden lion tamarin in particular being conservation’s representative ingénue in the region. Short of decades of nudging by the AMLD, I cannot imagine how protecting animals, especially specific ones, troubled them directly. To me this response indicated that they understand the widespread messages of what “protecting the environment” means to the NGOs, but left unanswered what (if anything in particular) it meant to them. Maybe the question itself was so laden with its own history and rhetoric that it left no opening for an individualized understanding of the concept. Maybe it had been pitched as too much of a strictly defined set of ideas and practices. An incongruously trendy looking girl in a black tube
top and large sparkling earrings said, with no little bitterness in her voice, that protecting the environment means that they cannot cut down the trees on their lot.

Her mother, Joana, took the opportunity to make her case. The problem for her was that the land she purchased here in Quete just a few years ago is dominated by a large, forested hill. According to Brazilian law, forests over 100 meters elevation and 45° incline are protected. This means that, above and beyond the law that requires 20% of any property in the Atlantic Forest region retain forest, high altitude forests are off limits for use, even if they make up more than a fifth of the property. While flagrant abuse of this, among other, environmental laws is far from uncommon in Brazil, residents of agrarian reform settlements have the unfortunate circumstance of government monitoring both by the Instituto Nacional de Colonização e Reforma Agrária (National Institute for Colonization and Agrarian Reform, INCRA), an agency specifically focused on agrarian reform settlements, and the environmental enforcement agency, IBAMA. Infractions of INCRA’s, or other government agency, laws put hard-won claims to the land at risk. As is often the case, the strict letter of the law is far easier to enforce on the economically and politically vulnerable. This is what protecting the environment often means here: it means that a new set of restrictions, heaped upon the legal, racial, and social restrictions the poor of this country strain against, conspire prevent a modest family from making a living.

Joana emphasized that she would never do anything so scandalous as to deforest the hill or burn it. "Conservo porque eu posso, eu quero conservar, só quero roçar por baixo, mas as árvores, lógico que não vou tirar as árvores," [I conserve because I can, I want to conserve, I just want to mow underneath, but the trees, obviously I’m not going to cut down the trees.] She presented herself as a willing and rational participant in the project of conserving the forest. By saying she conserves because she can, she emphasized the fact that she does not have to
conserve, she does not have to participate so wholly with the organizations here today that have clearly made the protection of this forest a priority. She counted on this reminder of her good will in all of this to recommend her plight. Clearing the undergrowth would give her extra space for her cattle and pigs, maybe for some shade-growing crops as well. As a middle-aged woman with newly discovered lumps in her breasts and a psychologically unstable daughter, her little kitchen garden, herd, and house were all she had to survive on. In his history of National Parks in the United States, Karl Jacoby points to a similar strategy in the Adirondacks, where local residents would justify ignoring Forest Commission timber laws “by claiming a natural right to subsistence” (Jacoby 2001:52). In Quete, the residents confronted the NGO representatives with very reasonable requests, as if the law could be discussed and negotiated here to establish some rational compromise. But Carol and Davi are not government representatives, nor do they have any power but that of clarifying the law (within the limits of their own understanding) for the gathered group. Carol’s colleague popped back into Quete’s community center for a moment and offered his take on how to interpret the law within the assentamento, “não é que não possa, entendeu, mais tecnicamente não deveria” [It's not that you can't, you know, it's just, technically you shouldn't.] Carol and Davi were less loose with their advice and regretfully told Joana that they think she cannot mow beneath the trees.

Carol continued and asked why everyone talks so much about the environment, is it important? The girl in the tube top had slung her head phones over her shoulder and filled the pregnant pause with an irreverent shrug of “é importante, pra mim é importante…” [it’s important, to me it’s important,] after which the room got quiet again. There was an abiding understanding that of course this environment stuff was important. In the grander scheme of important things, there are so many immediate threats to the life of a small family farmer on an
agrarian reform settlement that green living, here in this community, seems like it would be a distant luxury. And yet it was not. Though perhaps unable to articulate exactly what protecting the environment “means” to them, the people here value the health of their land, crops, families and community. Much is at stake here, and despite an inability or an unwillingness to speak the script of the ideal green farmer, at the end of the day many members of this community are betting on sound environmental practice. They understand the human health effects of pollution and pesticide use, from the angles of both production and consumption, in ways that many people do not. Undoubtedly there is a shrewd sensibility that perhaps there is money to be made in financial and technical support to be had if they align themselves with the local NGOs, but the members of the community have also seen and heard the arguments for ecologically sustainable farming and noted the simple fact that something must be done, for the soil and for themselves, and this environmental model seems to answer the call. They are willing to participate though it is never easy or fun to be the pioneers of anything. Given such good will and good faith on their part it is hard to stomach the persistent lack of support they generally suffer. 99 At the meeting, Carol’s colleague distributed an 11 page packet summarizing some salient points of the Forest Code. The cover page read, “O Amanhã só existirá se preservarmos hoje” [Tomorrow will only exist if we preserve today.]

Though they were the unfortunate interpreters of the law at the meeting, Davi and Carol actually represent the handful of passionate people and plucky organizations that are attempting to provide some measure of the much needed technical, legal, and moral assistance that the impoverished rural sector lacks. They are young, well-educated children of Brazil’s emerging middle class, driven by their ardent belief in a more equal society and an appreciation for the hard-working people of the local communities. The salary is low, the subjects are often needy
and eager to jump at the rare opportunity for a ride into town to the bank, the loan of a weed-
wacker, or any other small token of favor or assistance, but Carol and Davi undeniably believe in
the value of what they do. Davi later tells me that Vinícius, another employee at the AMLD,
feels sorry for Davi because he never gets to work with wealthy landowners, which could lead to
lucrative contract work on the side. Davi shakes his head, he does not know how to articulate to
his more materialistically-minded colleague how much his work among the assentados means to
him.

And what does his work mean to him? What does conservation mean to Carol? They
have asked this question of the farmers gathered in the community cooperative building, but
perhaps their audience is not as concerned with “conservation” per se as they are with healthful,
economically viable agriculture. The question, “what does the environment mean to you” is not
relevant to the farmers insofar as it places the environment front and center as the object of
interest rather than a critical piece of a negotiation between farmer, land, government, livelihood,
and morals. Davi and Carol, on the other hand, have more training and exposure to the idea of
conservation in and of itself. Their work with the farmers is born out of a concern for the
environment coupled with an understanding of the impossibility of detaching Brazil’s social
from its environmental interests. So how do they feel about the environment? No one at the
meeting turned their question back on them and I suspect that they, like their audience, would be
hard pressed to explain their feelings. “Conservation” and “the environment” which they offer
for discussion are very much newly minted objects whose construction as such has been
simultaneously birthed with the language used to invoke it. Thus, deeper than statements whose
contents are a foregone conclusion are the individual actions that, indeed, speak louder than the
mass produced words. Without describing conservation to me, Davi tells me about his master’s
thesis on the silvopasture system of agriculture that uses strategic placement of trees to increase pasture productivity as well as animal well-being and environmental health. He would really love to introduce this system to the pastoralists here. His neat, “everybody wins” vision of small scale agriculture is the beginning of a worldview in which conservation need not be separated out from other concerns because being in the world would necessarily entail balance and attention to the long-term effects of man on his environment. I find Davi’s perspective far more exciting and nuanced than the idea that caring for the environment means “protecting animals.”

Carol is not quite so solidly middle class as her co-presenter. The daughter of a local truck driver, she is lithe and thin as a ballet dancer, though not half so delicate. She was, by her own description, a bit of a wild child until she was 19, at which point she settled down with the drummer she met at a concert in the hippie, marijuana infused mountain town of Sana. She dresses unselfconsciously in strangely patterned pants and baggy tee-shirts. With her elegant, long fingers she is also adept at creating jewelry out of scraps of metal and seeds. The latter she gathers herself, like Jovelino of Carangola she has a little circuit through town where she knows she can find certain trees with interesting seeds. She drills the seeds by hand to be threaded into necklaces, bracelets, key chains and earrings. She identifies herself as the granddaughter of an assentada but her bearing and style align her equally with the young hippies whom we encounter at other events associated with the agroecology movement. Unlike these light-skinned young hippies, Carol is a self-described morena (dark skinned person) and the first of her family to go to college. She goes to community meetings even when they fall outside of normal working hours; she believes in what she is doing on the weekends, not just Monday to Friday. Over the months that I spent with her, watching the community get to know her, it became clear that they understood this subtle depth to her commitment.
Because Quete borders the Poço das Antas biological reserve it has been subject to decades of environmentally focused outreach to educate and assist the people living here with green agriculture, environmental education, and general advocacy. Just as “the management of a people’s practices and identities has come to play a central role in development programs around the world” (Collins 2011:694), conservation also requires local participation. Collaboration with the NGO based on the reserve is far from one hundred per cent, but workshops are well attended. Those members of the community who are most involved with the NGO have gone above and beyond compliance with environmental regulation to establish agroforestry systems, reduce pesticide use, plant native species and create artisanal crafts with natural substances. But though jeitinhos (little ways around things) exist for almost everything in Brazil, in this earnest, hard-working community there is no time off for good behavior, no leeway or hardship modifications. There is no channel by which Joana can more effectively barter her general benevolence towards conservation in exchange for her request to mow beneath some of the trees, a reasonable act by her estimation as it does not disrupt the trees themselves. Her rationality, “of course I won’t cut down the trees” is not met by the law with a balanced exchange of reason about the reality of conditions on her land or in her community. I find myself less able to understand positive feelings towards environmentalism in this context. Of course I want the agrarian reform farmers to be on board with green agriculture and conservation, but I cannot make sense of the fact that, despite the numerous difficulties they face, they actually are.

*Agroforestry in action*

The experience of conservation alive and well in Quete is not always so heavy handed and pedantic as someone asking them how they feel about conservation. One morning at the end
of March, I went with Davi to the community for a *mutirão*, an occasion when the community gets together to get a big project done for one of their neighbors. The concept is similar to an old-fashioned barn-raising. We had agreed he would come by at 7:30 a.m., but when I came out of my building at the appointed hour I was surprised to find him actually there. The Brazilian sense of time generally works on a bit of a lag, and never do I reveal my ultra-American-ness more loudly than I do by persistently arriving on time for things.

On the short ride to the bus station we discussed our mutual need to cure ourselves of the pointless habit of arriving *na hora* (on time.) Our punctuality was quickly remedied as we waited at the bus station for the third member of our party. Neither of us had ever met Ignácio, an agronomist who worked part time at the Casimiro de Abreu Department of the Environment and contracted for the AMLD. However, he and Davi had many mutual acquaintances from university, so with me squeezed between them in the front seat of the VW bus, they spent most of the 30 kilometer trip catching one another up on the whereabouts of various colleagues. Once we turned off the highway we collected more than one hundred seedlings from Quete’s only plant nursery.

The beneficiary of this *mutirão* was Ademir, a soft spoken man with a kind smile permanently affixed to his face. We arrived at Ademir’s *sítio* (place) and the morning began with plentiful sweet coffee and bread. Carol’s colleague dropped her off with a host more seedlings from his own nursery before he headed out to finish CEDRO’s neighborhood surveys. Once a number of people gathered, we collected the seedlings, the mowers, and other tools and set out to the section of Ademir’s property where we planned to plant. We went around a little kitchen garden, tramped through a muddy field, around a few cows, and up a hill to the 8,000 hectare plot. Ademir had planted some *pupunha* (an Amazonian palm) here, but most of them
died. Ademir, his son, and Davi proceeded to plant new *pupunha* seedlings in the places the first set had died. Two other men took turns with the mower, clearing the tall grasses from the uneven ground on the rolling hillside plot. Another few men used post-hole diggers in the cleared areas to make room for the plants, and the rest of us fanned out with the seedlings, mindful of our instructions to vary the species so there would be no clusters of a single kind of plant. In addition to *pupunha* we had *urucum* (the source of the food coloring annatto), *maracuja* (passion fruit), coffee, *juçara* (a regional palm variety) and *inhame* (yam). Predictable rows of a single crop have no place in this agroforestry system. We planted other varieties, *ipê*, *cinco folha*, and *ingá* (all trees) which do not yield food crops but return nutrients to the soil. It would be around four years before many of these plants bear fruit. The area would end up looking a little wild and overgrown, but the interplay of different plants would keep the soil healthy and the land productive. Ademir left the smattering of medium-sized trees on this plot unmolested as well. I noticed an *embaúba*, *carrapeta* (“planted there by birds!” says Ademir), and palm seem to be growing out of the same spot and ask if it is OK to leave them like that. “Don’t they all look healthy?” Ignácio responded Socratically. He explained that because some of them plants have deeper root systems than others, these three could actually share the same little patch of soil. This marvelous response illustrates well the richly layered understanding of the land that is born of agroforestry. Rigid rows of crops have no place here where species diversity creates a textured, flexible agricultural landscape.
By the time we stopped to drink some water and share a few oranges we were exhausted. It took a dozen of us over three hours to plant roughly two hundred seedlings; with only himself and his son Ademir could not have made such quick work of the plot. In their review of the social impact of protected areas, West, Igoe and Brockington point out the unfortunate fact that as NGOs attempt to integrate the local economy into more sustainable, conservation-friendly projects they also “at times, create a dependency on conservation projects for employment opportunities” (West et al. 2006:263). Here on the border or Poço das Antas, the AMLD makes agroforestry possible both through organization of events like a mutirão as well as supplying materials. The loan of the mower alone made an enormous difference, since otherwise the aggressive and tall grasses would have to be cleared by machete or burning, but at around R$2,000 such a tool is prohibitively expensive for a small farmer. After the mutirão, Gerson is quite frank that while the labor and technical assistance were nice, the seedlings themselves (about R$2 each) were also very likely out of reach for Ademir without the AMLD’s patronage and thus make the whole exercise worth it for the small farmer.\textsuperscript{101}
Carol and I were the only women present during the planting. The wives of the men remained below in Ademir’s house preparing food for our lunch. When we finally plodded down the hill we found piles of beans and rice, chicken, eggs, tomatoes, mushy spaghetti (the style in this area), carrots, salad, and plenty of extremely sweet juice. Ignácio thanked everyone for their hard work and reminded us that the plot of land we planted does not belong to the AMLD, it belonged to Ademir and his family. The AMLD, CEDRO, and all of us gave them a good start, but it would be Ademir and his kids who would take care of it, and benefit from it, over the years. Ademir led us in a prayer of thanks before we dug in, the numerous mangy dogs circling us in greedy anticipation of scraps and bones to crunch.

The agroforestry movement is tough work, both for the young extension workers and the community. The former, with their commitment to applying their education and passion to poorly paying jobs with people the elite of the country view as possessing no social consequence, are a small minority in a country where social divisions are deeply rooted in history and often indignantly defended in the present by an upper class unwilling to cede power or influence.102 The latter have been habituated to years of government neglect and general derision by the conservative national press that paints them as lazy freeloaders who are just out for free land. Both sides are working upstream against the impersonal and imposing restriction of law and habit. But if the community can resist the bitterness bred of not being able to mow under trees (and other things) then this alliance, based as it is on the miraculous desire for essentially the same thing from all sides, can become a powerful tool in favor of the paired causes of agricultural reform and conservation.

Conflicting ideas
Forget the National Parks

For many people, both within conservation circles and outside of them, the concept of what “conservation” looks like is illustrated by the U.S. system of national parks. This model appears across the world with large areas of ecological significance set aside from all but the most unobtrusive human presence. Nature is something sternly cordoned off from the rest of civilization and conservation programs are very much about maintaining boundaries (Hinojosa 1992) and classifying types of land and types of land usage. These perspectives may not be rooted strictly in an opinion about how best to protect nature, because “the issue is not nonintervention in the environment, but preservation of traditional modes of social and environmental interaction precisely because these have been found to work, at least for some (usually but not always) elite groups” (Harvey 1997:180). The way a society protects nature may also reflect and protect the social organization of that society. In this way, “the preservation of the political power and values of such groups is just as important here, of course, as environmental considerations” (Harvey 1997:180). A national parks model, such as that of the United States, fits neatly into a social organization in which hard-working, middle-class Americans drive their kids to Yellowstone to “experience nature” over the summer, but it does not match the realities of small farming and the agrarian reform movement in Brazil. Areas of legal reserve in Brazil, set aside strictly for flora, fauna, and permitted research are important, but do not respond to the lived conditions of the disenfranchised poor represented by the MST and the agrarian reform movement. This socio-economic landscape requires a more organic integration of conservation and “wise use,” as described by American environmentalists of the early 20th century. Agroforestry, by providing a smooth transition from closely protected forest
to neighboring agriculture land, makes sense in the Casimiro region, where islands of forest are surrounded by a sea of human population.\textsuperscript{104}

\textit{Oh não, meu filho virou hippie! (Oh no, my kid turned into a hippie)}\textsuperscript{105}

Advocates and intellectuals are not always quite in synch with the people with whom they would seek alliances and for whom they see important, if understated, roles in the evolving face of conservation. Imagine, if you will, a bunch of tourists from suburban Ohio sitting in white plastic chairs under a tent watching an African tribal dance group perform. Some of the tourists sway to the beat of the drums, most sit quietly, arms folded, taking in this exotic cultural display but unmoved to join the joyful dancers who undulate in front of them and offer their hands to incite their audience to move with them. Easy to imagine this stereotypical tourist situation.

Now imagine the exact negative of that image. A bunch of white hippie college kids with dreads, flowers tucked behind their ears, flutes, and flowing 1970s style frocks bend exotically to the rhythm, some beat drums while others flick tambourines and read poetry about reclaiming the land and connecting to their African roots. Looking on in polite confusion are the overwhelmingly Afro-Brazilian farmers, many of whom once forcefully occupied fallow land as part of the Landless Worker’s Movement, living in makeshift shelters for years before gaining the titles to the small plots where they now struggle for a living. The latter group is at a cultural performance, though the performers do not seem to understand why their audience lacks interest in joining the celebratory revelry.

It was early August. I was with Carol and a sizeable group of farmers and other extension workers representing our region, the Serra Mar, at the \textit{II Encontro de Agroecologia do Rio de
Janeiro (Second Agroecology Meeting of Rio de Janeiro) a statewide agroecology conference.

Our hosts at the Universidade Federal Rural do Rio de Janeiro (Rural Federal University, UFFRJ) were generous and gracious, if somewhat insensible to the cultural gulf between themselves and the contingent of farmers at the conference. Carol and I commented, not lightly, that after today the parents here would think twice before sending their children to college, should that even become an option. Vanderlei, the president of Quete’s community residents' association had already expressed some serious reservations about his young daughter one day moving far away to attend school. As a bleary-eyed girl set down her tambourine to dance closely with another girl, Vanderlei's expression remained blank and unblinking, but we felt sure that in about eight years when his daughter is old enough for university he would recall this scene and question the wisdom of sending his child away for an “education.” A few men sitting near me commented that they could not tell if one of the drummers was a boy or a girl. They did not say it meanly or with any kind of rancor, they were, quite simply, confused about the exotic tribe that they had discovered here.

The idea of the conference was to strengthen the community involved in agrarian reform and organic/environmentally responsible agriculture (Brazil has the dubious honor of being the world's number one consumer of pesticides according to the conference keynote). That the farmers left their land for three days and took a bus to a city three hours away was a huge undertaking and an impressive display of spirit. Seasoned and worldly traveler that I am, sometimes it is hard for me to imagine such a trip as any kind of hardship. But even for me, after spending so long in Casimiro travel began to feel overwhelming. I remembered how difficult it was for me to get from Casimiro to the closest of agricultural community, Autaz-Mirim, an hour
on my bicycle down a head-rattling, bumpy dirt road. I remembered that unlike many of the people from these communities I could read Portuguese easily and afford bus tickets.

Cultural cognitive dissonance aside, the conference was a really incredible experience. Those nutty hippies with their tattoos and ear spacers were warm and welcoming and generous of spirit. The agriculturalists exchanged ideas, shared seeds, and conducted workshops. The first day of the conference was a fair, with each region setting up tables around a large interior courtyard. The farmers displayed their products – honey, homemade sweets, seeds, jars of candied fruit, artisanal banana fiber weaving, coffee, eggs, and inventive planters made of repurposed plastic jugs. Shy at first, the farmers soon began wandering around the quad, admiring the products brought by others, asking questions, and exchanging seeds and ideas. The third day was devoted to smaller workshops, some lead by agricultural extension workers like Davi and Carol, others lead by agriculturalists sharing their expertise in medicinal herbs, bio-fertilizers, homemade soap, and community tourism.

Figure 16. The Serra Mar region delegation

Equal parts practical advice on agricultural techniques and primer on social inequality in the country, the conference addressed the paired struggles for social and ecological justice. Too often, “the narrative concerning threats to biodiversity emphasizes loss of habitats, species introduction in alien habitats, and fragmentations due to habitat reduction, rather than underlying
questions of power” (Heller and Escobar 2003:158). The conference at UFFRJ was part of a larger, growing movement represented by the Articulação Nacional de Agroecologia (National Agroecology Network, ANA). In addition to regional conferences such as the one I attended, there are national conferences that gather groups of stakeholders from around the country. Founded in 2002, the organization’s mission is to bring together networks of people and organizations working to promote agroecology, strengthen family agriculture, and support sustainable rural development (ANA 2013). The agroecology movement in Brazil is an important link between conservationist interests and the plight of the small farmer.

The realities of the struggle of the ongoing agrarian reform movement in Casimiro were starkest in Autaz-Mirim. I met a few residents of the settlement during the conference, after making it widely known among our delegation that I had to meet the maker of a particularly delicious corn cake that someone shared among our group. A shy but pleased Dona Zoraide claimed credit, and I sat with her and other residents of Autaz-Mirim during a lunch break at the conference. The general amusement at this little American’s strange fascination with the most banal of confections was soon forgotten and replaced with an animated discussion of the politics and the fate of the community. It seemed that soon after the conference a representative from the INCRA, the government agency that redistributes and regulates the nation’s reform settlements, was due to appear in the community to answer questions and discuss the path to legality. I asked if it would be alright if I came to the meeting, and they warmly encouraged me to attend.

Figure 17. Corn cake
**Autaz-Mirim**

Autaz-Mirim is relatively close to Silva Jardim and the BR-101 as the crow flies, but for us two-legged animals it is only accessible by heading to the end of Casimiro de Abreu, where the cobble stone road ends, and following kilometers of dirt paths that wend through the low, flat plain. I asked around, but no one from the AMLD or CEDRO planned to attend the meeting with the INCRA representative, so I decided to brave the journey alone and without the benefit of a *carona* (a ride). It would take about an hour to bike from Casimiro to the Autaz-Mirim community center. The day was bright and warm and, as always, it was windy on the vast low plain. I left town late, but pedaled like mad to arrive on time. Dona Zoraide greeted me and told me I looked white. I smiled both to mask my dizziness and because I was grateful that someone I knew had arrived at the community center before me to provide introductions.

The community center was a small rectangular building divided into three segments: a kitchen, a small classroom, and a larger meeting space/health post office. We milled about, pushing our bicycles into the tiny bits of shade provided by the overhang of the roof as more people slowly gathered. Renato, a man I had met at the conference, came with his young wife and two small children. Walter, another conference attendee, arrived with a sack of soybeans. He did not care to plant them because they were transgenic, so he decided to give them away to be eaten. Both teased Zoraide that I’d come for more corn cake but she had failed to make any! She looked briefly mortified, and I tried desperately to explain that of course that was not why I had come. I hoped she believed me.

As the crowd grew we pressed ourselves into the larger room at the end of the little building to start the meeting. People were spilling out of both sides of the room. Renato, the
president of the community association, opened by saying that the INCRA representative, whose presence was the initial point of this meeting, would not make an appearance. Renato had only found out last night, not enough time to get in touch with everyone to cancel (a reality in these communities of poor roads and poor cellular service). Since everyone had already gathered they would discuss other community issues. The meeting to ask questions about the process of becoming *assentados* would be rescheduled for the same time next week.

They talked about the problem of getting kids to school. Fifth grade and up would still go to Casimiro, but they were in the process of having fourth and under here in this very community center. Something had to be done about the roads. Work had begun on an old bridge over a creek, but the firm doing the work has not been paid by the state so they had ceased work. Some members of the community grumble that they should not have torn down the old bridge first; now it takes an extra half hour by car to get from Casimiro to most of the community (I had walked my bike over the slab of wood remaining where the bridge had been and saved myself quite a detour). The roads in general were fine in dry weather, but when it rains they turned to soup, making some segments entirely impassable.

They continued on through a host of different problems: in six weeks a nurse and a psychologist would be at the community center if anyone needed to seek some medical assistance; Renato reminded everyone to be careful using fire, both because of the physical danger on low flat plane and also because the impending legalization meant more intense scrutiny from INCRA and they could not afford any mistakes; the residence were still trying to borrow a tractor for some bigger agricultural projects, but Casimiro and neighboring Silva Jardim were in disagreement over which municipality was responsible for Mirim and were both
ignoring the requests; there had been a slew of robberies in the community, but Renato assured everyone that they will catch the culprit.

The meeting ended on a hopeful note. Renato felt confident that INCRA would soon come to Mirim and the process of becoming *assentados* would carry on. I did not share his confidence. Carol at CEDRO told me that often a community needs an ally within INCRA, someone to push for their legalization. I learned later that the INCRA representative failed to show at two subsequent make-up meetings, and for at least one, again called at the last minute with a weak excuse that angered and frustrated the residents.

~ ~ ~ ~

One beautiful Friday I hopped onto my bike and rode out to Dona Zoraide's house. Autaz-Mirim is striking. The community covers a vast, low plain, and the lots are relatively large, averaging over twenty hectares. Unlike hilly, forest dotted Quete where houses hugged closely to the main road, the large distance between the houses, often set far back from the road and hidden by distance and large stretches of tall grass, enhanced the expansive feeling of Mirim.

![Figure 18. On the road to Autaz-Mirim](image)

I had no specific questions or aims that day. Dona Zoraide greeted me without fuss, as though this whole exercise of a random American biking to your house were completely normal
(despite the fact that experience told me that people around town found my propensity to expend that kind of physical effort to get out to the middle of nowhere odd, to say the least).

Dona Zoraide walked with me into the woods behind her house to show me where her husband kept his beehives. We wandered the trail a bit further into the forested hill so that she could show me a very old tree. She intended to show the INCRA representatives this tree when (if) they ever showed up. “Isn't it nice to be near nature like this?” she asked me wistfully. It amazed me that even someone who works and struggles on the, often unforgiving, land could come to the same conclusion about its sweeping vistas that I did. Her interaction with nature was wise and practical, too. She wanted to move her house closer to the woods where it would be cooler. INCRA’s rules stipulate that houses must be at least 100 meters away from forest. But Zoraide said that this rule was bred of a fear of fires, and she was sure that she could convince them that this was simply not a danger. Outsiders frequently blamed the acampados and assentados for forest fires in the region (see endnote 99), but the communities protested, insisting that they lived on the land, of course they knew better than to set fires during the dry season! Hunters or people on vacation having barbecues were the more likely culprits.

After we scampered around a bit she finally conceded, “perdi à arvore” [I lost the tree], but as we emerged back into the sunshine she casually told me that there are golden lion tamarins living in this patch of forest. Her assertion took me aback. Tamarins? Right here? I recalled a meeting of the AMLD and its partners at which they discussed ways to strategically connect the existing wild tamarin populations, and someone floated the outlandish possibility of reforesting a 30 kilometer corridor between the reserve and the hill that Vinícius, Samuel, and Alex had surveyed back in June (chapter 2). We could see the reserve from the road in front of Dona Zoraide’s house. But a creek, some farmland, and a yawning chasm of local and national politics
separate these “sem terra” tamarins from their legally settled brothers at Poço das Antas. Like agrarian reform and land redistribution, tamarin conservation is built of negotiations between a wide variety of stakeholders, and even within an apparently singular group (conservationists, farmers) diverse perspectives exist (see also Wolford 2010). Tamarins also should not be taken for granted as a fixed and known quantity. The tamarin that is known and discussed throughout the region did not bound out of the dark wood unaided; it is the product of years of interaction, research, and data collection. In the following, and final, chapter, I turn back to the tamarin to look more closely at how the creature we discuss today emerged.
CHAPTER 5, Locating tamarins in the forest (or, cadê o mico?)

Working in the woods

It was all I could do to keep up with them as they dashed effortlessly across the lightly worn trail through the forest. We worked our way carefully across a wide creek; I at least was keenly aware of the water’s descent into a small waterfall immediately to the right of where we made our crossing. A steep incline up and away from the water challenged the limited reach of my short legs and was followed by an equally steep decline. As we wound our way down I grasped fecklessly at woody vines, temptingly sturdy in appearance but ultimately too slender to support my graceless descent. Some parts of the trail were wide enough for a person and a half. In other places, leaves and branches pressed themselves into our path. Orascio hacked at the errant growth, “All for science!” he laughed boyishly, as he pruned; trail maintenance was an important part of the daily routine. I kept my eyes on the ground, watching for stray branches and mud, using the upper reaches of my peripheral vision to follow the heavy work boots that sailed on ahead of me. I concentrated so intently on the minutiae of the forest floor beneath my feet that I was caught completely off guard when we stopped. “Ah, here they are,” Orascio said calmly, and lo and behold, five screeching golden lion tamarins materialized out of the forest. They clung to tree branches above our heads and yelled like ferocious little muppets at the invaders to their territory.

The AMLD’s tamarin “reintroduction team” is charged with keeping careful tabs on all of the tamarin groups that have been released into the wild. The team keeps detailed notes about births and deaths of individuals, formation and dissolution of new family groups, presence and quantity of invasive sagüis (common marmosets), habitat condition, and evidence of hunters.
When I first arrived in Brazil in 2008 I spent much of my time with Diana, Orascio, and Bento as they traveled down back roads and into the tangled forest, tracking down the more than one hundred tamarin families that now live in the wild on scattered private lands throughout the municipalities of Casimiro de Abreu, Silva Jardim, and Rio Bonito. The team always started early, sometimes stopping at the AMLD offices to join the other staff for a morning coffee, but often heading straight into the woods. Too many tamarins live spread across too large a territory for the team to check in on all of them each day, so Diana, the team leader, kept a schedule to be sure that each group got regular visits.

Tamarin families are typically comprised of 5-8 individuals, with an alpha male and alpha female in the lead. The animals are territorial and, because they live in isolated forest fragments, their habitat ranges are limited. These facts, plus the radio transmitter collar fitted to one alpha of each group, make the tamarins relatively easy for the reintro team to locate. Waving an antenna that looked like they ripped it off the top a television set, they followed the faint beep from the radio transmitter slung around Orascio’s neck until the increasing strength and frequency of the blips indicated that the tamarins were getting closer. Diana and Bento made clucking noises and gave faint whistles to coax the animals towards them.
Thanks to their regular rounds, the team knows how many tamarins to expect in each family territory. Once they found the tamarins, they made observations about each individual. The tamarins themselves do not have names. Groups have names (often no more imaginative than the name of the property where they live), and tamarins within each group have a number. But even seasoned field researchers like Diana, Orascio, and Bento cannot differentiate individual tamarins by sight. Males and females do not exhibit sexual dimorphism, and GLT fur is a uniform, unpatterned orange. Instead, the reintro team must rely on dye markings (explained further below), radio collars, observations of who hangs out with whom (for example, certain parent-child or sibling pairs might be known by the reintro team to stay close to one another), and combinations of the above to establish which tamarin is which.

As I stood with the team counting the tamarins, one tamarin was unaccounted for. Was 456 missing? Or 1031? They finally agreed on which was the absent animal and we moved along. Each individual tamarin need not be visually located each time the team is in the field. It is only after the persistent absence of an individual (or the absence of a very young or very old tamarin) that the team would begin to wonder if something had befallen the mico or perhaps the individual had been nudged out by the family or chosen to branch out on its own. As we departed, Bento left a bunch of plump miniature bananas on a wooden platform, spearing a few of them onto twigs like hot dogs at a camp fire. The tamarins eagerly attacked their snack once we began to back away.

The team constructs these platforms within each tamarin territory. Whether or not they get a visual on a particular group or individual, the AMLD team regularly leaves little bunches of bananas, a favored mico snack, to “maintain contact” as they put it. Like Boo Radley’s tree stump offerings, the bananas are enough to keep the tamarins returning regularly to check for
presents. This way, should the AMLD ever need to locate a particular group, they can be reasonably sure that the monkeys will eventually come by the platform. The wild tamarins recently discovered in the mountains are much more difficult to find than their lowland brethren. Neither released nor relocated by the AMLD, these tamarins are not privy to the unspoken contract between researcher and monkey, the interspecies cooperative dialog facilitated by banana offerings.\textsuperscript{110} To make matters more complicated, their territories are filled with enough freely available bananas to make the reintro team’s offerings less interesting.

The tamarins on the fazenda we visited were not tame or trained. These individuals were not dependent on people for survival (though should their population again face mortal danger, the AMLD would surely intervene on their behalf).\textsuperscript{111} However, despite the fact that they are unquestionably wild animals, tamarins have a unique relationship with humans. I discussed their existence on a line between exceptional and quotidian in chapter 3, but more than that, GLTs are intimately known in a way that most other “wild” animals are not.\textsuperscript{112} Their lives have been painstakingly observed and cataloged for decades, through numerous generations of tamarins. As the flagship species for the Atlantic Forest, the tamarins make the forest legible (Cronon 1995:82; Sodikoff 2009:450), and the vast collection of tamarin research makes the \textit{Leontopithecus rosalia} species legible, in scientific terms. Tamarin legibility in turn writes itself onto the forest, shaping the way that the forest is protected and managed. In this chapter I will explore some of the activities of day-to-day tamarin field research with an eye towards unpacking the complex interplay between tamarin, forest, and the ways that both are known and knowable.

\textbf{A history of data collection}
Orascio started working at the AMLD more than 25 years ago. Bento, the youngest member of the crew, has spent a mere decade following the monkeys in the woods. Diana, the original member of the team, joined the AMLD in the early 1980s. She started the work at the tender age of 18, as a volunteer, and before long became part of the staff. Early on she showed a natural gift for field work and has long been a trusted field coordinator of the tamarin project. She also has an encyclopedic knowledge of the details of the tamarins’ lives. Details of births, deaths, fights, friendships, power grabs, spurned lovers disappearing into the forest – the decades of tamarin research unfold like a Gabriel García Márquez novel. On a local property near the reserve, the team noticed a male from one group and a female from a neighboring group missing from their respective families. They were found together, staking out a new territory. The team was not sure if the new couple would last to build their own family.

Tamarin families are headed by an alpha male and alpha female. For the most part, only the alpha couple breeds. Tamarins typically give birth once a year, or twice if the timing of the rainy season leads to a particularly abundant year for food, to twins or a single offspring. The other tamarins in a group are generally the older offspring of the alpha pair, though immigration of outsiders does occur. The whole troop helps with infant care, critical to rear litters of twins. Eventually, the older offspring leave the kin group. Males are more likely to join nearby groups than females who become “floaters” (Baker et al. 2002:206) when they leave; females are “more likely to inherit natal territories” (Baker et al. 2002:211). Despite a recent New York Times article that declared the tamarin “a stunningly monogamous creature” (Zimmer 2013), the scientific research suggests a far more fluid and complex society. Not only do some tamarin groups exhibit polygyny (Baker et al. 2002), more than one reproducing female, a recent study of three years of data found that “all adult females over 3.9 years of age became pregnant” (Henry
et al. 2013:679). Henry et al. found that most groups experienced polygyny, though the alpha female’s infants were more likely to survive.\textsuperscript{115} Because the reintro team is in the woods, checking in on the monkeys, five days a week, such intricacies of tamarin life are recorded in detail. Diana and her team appear in the acknowledgements of most of the scientific papers produced about golden lion tamarins, sometimes listed by name or simply as “the reintroduction team.”

More important than the drama of tamarin lives and lifeways is the sheer volume of information that has been collected over the last three decades. The preponderance of data about this single species is rare in its thoroughness. Other fauna fill the Poço das Antas biological preserve (Brito et al. 2004), some of them also endemic and endangered, and yet when researchers – graduate and undergraduate, Brazilian and international – come to the reserve they most often come to study the golden lion tamarin.\textsuperscript{116} At this stage in the game, tamarin-centric studies are almost a foregone conclusion. Like the “tamarin farmers” of chapter 2, spreading most thoroughly the seeds of the plant species that they prefer, the tantalizing quantity and quality of the tamarin data, both historical and continuously produced, ensures that even students who might have a passing interest in another species will find their studies of the Atlantic Forest easier to conduct with the mico as their point of reference.\textsuperscript{117}

The seemingly unstoppable machinery of tamarin data collection suggests interesting questions about the relationship between production of data, ownership of the tamarins, and control of the forest. Rather than an inert object or voiceless artifact, the tamarin data can be thought of as “an ethnographic object, an analytical category, and a methodological orientation” (Riles 2006:7) that profoundly impacts conservation work and the shaping of the landscape. Observed tamarin preferences may influence seedling selection for reforestation or make a
private property more valuable in the eyes of conservationists who would work with the landowner to protect the area. The collection of data about the tamarins is not a purely objective etching of fact onto paper (if the belief in “pure,” “objective” science still persists in the wake of science and technology studies, which compellingly strip the “hard” sciences of their myth of absoluteness.) In these ethological portraits, tamarins are transformed into letters and numbers, their activities translated into a selection of expected behavior variations, their presence or non-presence at the surprise rendezvous with the reintro team noted and established (through comparison with earlier recorded observations) as normal or abnormal. Donna Haraway describes the animals enrolled in Species Survival Plans®, such as the carefully managed captive GLTs described in chapter 3, as “species of organic, organizational, and technological kinds” (Haraway 2008:147). Though less directly managed, the wild tamarins too exist as a combination of organic matter and data: blood samples, table entries, GIS points. Metaphorical links exist between nature and the computer world of data and programs, a linkage explored by Stefan Helmreich’s monograph on Artificial Life. Scientists in that field feel that self-replicating computer programs “can be considered new forms of life, forms that can be quickened into existence by scientists” (Helmreich 1998:3), their ability to grow and mutate of their own accord a key element to their life-likeness. The comparison of tamarin data to the computer worlds of Artificial Life is imperfect. Tamarin data is not a computer program and does not replicate itself; replication and growth is the product of constant input. Day after day, week after week, year after year tamarin lives are encoded into tamarin data. However, Helmreich’s computer science researchers are able to make the comparison between their programs and biological life because they “see both computers and nature as enacting processes of information transformation”
(Helmreich 1998:73). Tamarin data might not be as autonomous as a computer virus, but it is changeable and mobile.

One critical aspect of tamarin information is that once recorded, it travels beyond the forest. Historically, ecological data played an important part in colonial and imperial development. Lucille Brockway’s work (2002 [1977]) on Kew Gardens in London explores the role of botanical knowledge in British empire-building and Londa Schiebinger (2004) traces the divorce of local ecological knowledge from specifics plants when that knowledge was incompatible with imperial social mores. Beyond facts about the plants themselves, details of newly “discovered” flora and fauna played a part in the ideological construction of colonized places and peoples. In his history of botanical collection in China, Eric Mueggler describes that the process of “summing up a landscape and its inhabitants in a series of comprehensive reports had been central to the colonization and administration of India” (Mueggler 2011:44). The Royal Geographical Society collected the notes and photographs sent in by botanist George Forrest as he traveled China in search of specimens. These dispatches were duly labeled, sorted, and filed alongside other similar material, for “after the mid–19th century, British imperial power found unity and coherence in an archival myth: the idea that institutions of knowledge production could forge the millions of facts flowing in from all corners of the world into a coherent whole” (Mueggler 2011:45). Through descriptive classification, piles of data could be not only woven into an understanding of these far-flung places but translated into control (albeit imagined) of the place from whence the data emerged. Though Mueggler describes this as an “archival myth” of imperialist governance, the parallel to tamarin research is compelling. What “coherent whole” is manufactured with decades of tamarin data? Researchers record tamarin lives into tamarin data, and from tamarin data emerges a new tamarin, the ecological, scientific
tamarin. This tamarin, triangulated between a prescribed set of data points, is expertly defined and described as the focal point of a resurging Atlantic Forest habitat. Although research on other species does happen, and Poço das Antas in particular is a rich site for tropical mammalian species (Brito et al. 2004), the Atlantic Forest is subsequently defined and described around the tamarin in a self-sustaining and recursive process that, through its series of removals, belies the impact of the regular exchanges between Diana, Orascio, Bento, and the micos, the exchanges from which the knowable tamarin emerged to begin with. There is the possibility that “the objectification of endangered species as genetic resources tends to decontextualize them, removing them from locally embedded and culturally meaningful patterns of human-animal relations” (Heatherington 2011:41). Tamarins ought not be reduced down to, or replaced with, data points or table entries. They have layers of social context, from their relationship to the human population, their relationships within tamarin kin groups, and their relationships to other flora and fauna of the Atlantic Forest ecosystem.

The social studies of science literature discusses and problematizes the perception that science and data are entirely objective recordings of fact. This is also the case for ecological data and research. Rejecting the vision of the naturalist simply transcribing the objective truth of the surrounding world, anthropologist Timothy Choy suggests that “the relations among and between different forms of life are not simply ‘out there’ to be discovered, nor are their spatial and temporal scales self-evident.” These relations, he suggests, “all must be posited and established through scientific (ecological) research” (Choy 2011:Highlight loc 197-98). Observations of the natural world must be placed into context, and the context in turn is not a “given” but rather the result of other observations and research. Much of the understanding of the Atlantic Forest here in southeastern Brazil is established through the lens of research on the
golden lion tamarin. The wide reach and breadth of impact of tamarin data has already appeared in the preceding chapters. Forest is restored strategically to link existing tamarin populations to one another, satellite images and GIS maps track tamarin populations and tamarin-appropriate habitat across multiple municipalities, a community survey registers *mico* presence and favorable *mico* habitat conditions on properties large and small across the region, local environmental education focuses on celebrating identification with and pride for the golden lion tamarin as a singular local icon, and small scale farmers are encouraged to explore agroforestry methods with the explicit intention of both benefitting the farmers and contributing to a quilted fabric of tamarin-accessible landscapes. Through numerous projects and on a variety of levels, tamarin research shapes the conservation of the Atlantic Forest in Rio de Janeiro.

**Ongoing work**

Every Monday morning, the team drove their rough-looking *kombi* (VW bus) into Casimiro to buy bananas from a warehouse in the “industrial” part of town to the north of the BR-101 highway. Sufficiently stocked, they came to pick me up for yet another day in the woods. Cages entirely filled the back of the kombi. One of the tasks for the team that week was to catch a family of *micos* whose radio collar battery was running low. Since they would need to catch the alpha sporting the collar, it was as good a time as any to collect the whole family for blood draws and other procedures too invasive to perform on fully conscious animals in the wild.

The GLT family in question was one of the more distant groups, located in Rio Bonito, about 50 kilometers down the BR-101 towards Rio de Janeiro. As we left the municipality of Silva Jardim and continued in the direction of the city, the landscape became visibly more urban: the highway expanded from two lanes to four and the route was lined with buildings and large
bus stops instead of trees. Despite the urban feel, this area was home to a significant population of golden lion tamarins thanks to a landowner who was also a friend to the AMLD. The fazenda (plantation) dated back to slave times. Once a coffee plantation, the owner kept only cattle on some pasture, leaving the rest as native forest for a large number of golden lion tamarins. In 1992 four groups were released on this land and in 2010 there were more than 30 families. Virtually alone, this fazenda is one of the seven major population segments that make up the tamarin “metapopulation,” a term referring to the geographically separated pockets of the tamarin population.

After leaving the kombi on a dirt road and cutting across a short, flat path into the woods, the team set seven traps on the banana platform. They told me that sometimes, in advance of catching a group, they would leave the traps baited but propped open for a couple of days so that the micos would overcome their natural wariness of the cages. They liked to catch as many of the family as they could in order to process more animals back at the lab, keep the family together, and for the safety of the tamarins. Today was not a drill. The team placed bananas in the back of the traps and set the cage doors. We set off to leave bananas for half a dozen other groups around the fazenda, and when we returned to the traps five of the seven held tamarins. Bento, Orascio, and I packed them into the kombi and waited for Diana who remained in the woods, hoping to snare the two remaining micos. After an hour it was clear the other two were not going to make the same mistake as their unhappy brethren. We headed back towards Poço das Antas.
The lab space at the AMLD was little more than a shed with a sink, some shelving, and a couple of bare tables. The animals were sedated so that Diana could take a series of measurements: body, tail, hand, foot, leg, skull, teeth, testes. She also jotted down other observations: lactating? glands swollen? any strange scents? fur color and condition? She weighed each individual and took blood samples. Many of the animals had identifying tattoos on their inner thighs. Diana re-inked some faded markings and gave an unmarked tamarin its tattoo. On top of all of the other means of identifying the animals, the tattoos provided proof positive of individual identity. This level of detail is probably not necessary for the reintro team to do their work, and the tattoos are obviously not visible in the wild where the unsedated micos would not tolerate this kind of prodding. However, the daily maintenance of the tamarin population is not the end point of these activities. The reintro team’s work ties back to the continued scientific management of the population, including research of graduate students and scientists on everything ranging from hormones to intestinal parasites to vocalizations to parenting.
Meanwhile, Bento and Orascio fitted one female with a radio collar. They also applied dark dye to certain patches of fur on each individual. The dye patches make the individuals discernible from a distance, an important tool for field researchers (including the reintro team) who must routinely recognize these tiny creatures while they are jumping around on tree trunks high above. The team keeps records of the particular dye partners for each group so that they know that, in tamarin family X, a dark patch in the middle of the tail is female 1, left thigh is female 2, right shoulder is juvenile male 1, and so on. Once all of the medical and cosmetic procedures were over, the sleeping tamarins were gently placed back into the cages they were caught in and neatly stacked on the floor covered in sheets of newspaper. They must remain overnight to allow the effects of the anesthetic to wear off. The team would observe them again in the morning to verify that they suffered no ill effects from their field trip to the AMLD lab station and were ready to be released back at their home territory.

Though living in the wild, these tamarins are a highly managed population. For the most part (the *serra*, highland population excluded here), the AMLD knows each tamarin family, the number of individuals per family, when babies are born, etc. The reintro team does not intervene, as do studbook keepers who carefully select breeding pairs for maximum genetic diversity in the captive population, but the AMLD as an organization supports multiple projects (forest reconstruction, agroforestry, environmental education) that protect the GLT habitat and
livelihood. And the everyday doings of the animals shape the way that conservation happens in the Brazilian Atlantic Forest.

GLT, superstar

The team picked me up in Casimiro the following week and we stopped at a fazenda just 20 minutes down the highway from Poço das Antas. Our turn off of the BR-101 was marked by one of the many public phone booths decorated with tamarin sculptures that are scattered around the area; yet another reminder of the iconic status of the mico. We continued only a minute or two down the wide paved road before pulling up onto the grass to park the kombi beside an unassuming wood fence. We piled out and the team began unloading cages. Though they had been near my feet the whole trip, I had not realized that the cages held six trapped tamarins. This group, like the previous one, had been caught to replace a fading radio collar battery, then given the night to recover fully from the anesthesia. Today they were to be released. I grabbed one of the cages and we marched through the dense, knee-high grass, the little animals squawking with indignity as we went. I dutifully carried my cage and fought the urge to tap the little primate through the cage wire. When we arrived at the edge of the forested area, the cages were opened and the tamarins free at last.

Figure 22. Public phone booth decorated with tamarin
As the little orange bursts bounded through the tree branches, I noticed that none of the group had the dark dye patches on their fur. Orascio explained to me that though the groups on this fazenda do have radio collars, the AMLD purposefully forgoes the dye procedure because this is the “TV group” that they show to visiting tourists and photographers. As PR representatives of their species they must retain their natural look. This makes the individuals more difficult to identify, but the group also receives bananas so often (to bribe them to show up for the cameras) that they are not a hard group to locate in general.

Describing a book of animal photographs, art critic John Berger notes that, animals are always observed. The fact that they can observe us has lost all significance. They are the objects of our ever-extending knowledge. What we know about them is an index of our power, and thus an index of what separates us from them. The more we know, the further away they are. [Berger 2004 [1980]:257]

Pictures of animals, like animals in zoos, are opportunities to look at “something that has been rendered absolutely marginal” (Berger 2004 [1980]:260). In Berger’s argument, people have become disconnected from nature and have replaced animals with passive, symbolic stand-ins (photos, realistic stuffed animals, zoo residents). The unmarked tamarins have been habituated to human presence and primed for cameras, but I do not think that the tamarins have been stripped down to nothing more than reproductions of an idea of “tamarin.” Some plucky quality prevents them from becoming “absolutely marginal,” perhaps their personable, human-like qualities. Anthropomorphism has the benefit of maintaining a sense of connection between the animal and the human in the face of “othering” and objectifying gazes. Part of the charisma of the cute and energetic tamarin might be its insistence on returning the gaze, and even Berger agrees that connection to other creatures that makes us a less lonely species. Anthropologist Agustín Fuentes describes the human “sympathetic imagination” which allows “us to extend the notion of ‘personhood’ beyond our species and to use this expanded conception to extend rights
to animals and call for their humane treatment” (Fuentes 2006:125). As animal ambassadors, tamarins accept the mantle of tamarin-personhood, and their charisma effectively “speaks” to the human sympathetic imagination. As they look out at us from their tree branches, they elicit a sense of connection, an understanding, from one primate cousin to another.

Soon thereafter, I returned to the same property with the team as they introduced a group of French tourists to the resident tamarin families. Machetes in hand, the team guided the tourists to a worn patch at the border of the forest that marks the beginning of the footpath through the woods. There was only a slight decline from the level of the street into the forest itself, then the rest of the trail, though winding, was relatively flat. Trees densely covered the patch of forest near the road, but as we continued the path opened into a brief stretch of tall grass and no trees. Forest cover crept back over us as the trail continued away from the road. The team listened for the blip of the radio collar signal, clucked and whistled to let the tamarins know they came bearing gifts. Before long, branches high above us began to twitch and little squeaks and shrieks announced the arrival of the golden monkeys. The team skewered bananas to a number of twigs. Human coos of delighted joined tamarin chirps and cameras clicked eagerly at the primate Giseles. There is very little that GLTs do that isn’t adorable (besides eat bananas that do not belong to them, see chapter 3). The tourists asked the team questions as they took pictures. They asked many of the same questions that I had asked when I first began going out in the field, and they were surprised or interested by the same things I was, too. The team took it all in stride. As I listened I started to think about the age of this project, the number of tourists, students, researchers, and interns that have cycled through; I felt awe for the team members’ patience. They were charming, enthusiastic, and genuine; nothing in their manner let on that they had said the same thing innumerable times over the last decades.
I asked Bento if he ever found the routine of their work dull. Sometimes, he said, but there were always new projects, new groups of *micos*. His answer intrigued me because even new groups in new areas must be monitored with the same regularity and the same methods. New projects probably do not mean new kinds of work, just the same work in different places. What keeps this work interesting to Bento is the changing view of the tamarin population, the discovery of new families in new places. It is not the work per se that captivates him so much as the animal itself. I return here to Lorimer’s discussion of nonhuman charisma, first mentioned in chapter 3. He introduces the concept of “corporeal charisma” as a specific relationship between animals and the people who study them (as opposed to aesthetic and ecological charisma which are more widely experienced). He includes in this definition the emotional satisfaction felt by naturalists (both professional and hobbyists) in making lists of species (Lorimer 2007:922), the intellectually validating activity of identifying species (Lorimer 2007:923), and moments of childhood epiphany that set them on the path towards their research (Lorimer 2007:921). Far from becoming bored by their routine encounters with the tamarins, the reintroduction team members, like other scientists and naturalists to their subjects, feel bound to these animals by their habitual interactions.

Biologist E.O. Wilson suggests, “humanity is exalted not because we are so far above other living creatures, but because knowing them well elevates the very concept of life” (Wilson 1984:22). Viewed in these terms, the intimate knowledge of the tamarins produced by the AMLD is important not only to Atlantic Forest research, nor even just Brazilian national pride, but to the broad project of conservationists worldwide to draw mankind into deep conversation and meaningful relations with the plant and animal denizens that we often find easy to ignore. Scientists might grow attached to animals that lack the tamarins’ mass appeal. Even hyenas, for
example, long reviled by Westerners and even in African folklore, have their defenders. Biologist Stephen Glickman explains the basis for the connection between his team and the hyenas they studied: “we were so out of step with the rest of Western culture in our attitudes towards hyenas [thanks to] a combination of knowledge, familiarity, and bonding” (Glickman 1995:532). Lorimer’s definition of charisma deepens the concept of the animal ambassador by including the special and specialized relationships of animals with the biologists who research them. The tamarin is lucky enough to have the affections of scientists and a broader public, making it suitable as an ambassador species. The charismatic tamarin is not just an animal that tourists want to take pictures of; it is an animal entangled with researchers who come to define themselves by their work with the tamarins and who are themselves changed, energized, addicted even (as Lorimer dramatically puts it) by their quotidian dealings with micos.

Locating tamarins

The star power of the tamarin, equally charming to all from the researchers who follow them daily to local school children to international conservation biologists, is a key element in the conservationists’ campaign to save the Mata Atlântica. Anyone handling Brazilian currency sees the tamarin’s face on the new, yellow R$20 note. And now, its most recent media campaign is a run at the chance to be the mascot of the 2016 Olympics, which will take place in Rio de Janeiro. The species is highly visible, even to those who do not have the opportunity to spot the flash of orange fur deep in the forests of Brazil. The visible tamarin-superstar is the chimera of the scientific tamarin, born of tamarin data, and the stories and images (another form of data collection) that present the tamarin as knowable to the non-scientist as an expressive, adorable, and relatable emissary from the natural world. The tamarin that we engage with is multi-faceted,
but it is also created as such through our own efforts of data collection, research, PR, and myth building. Without radio telemetry to navigate the scattered blips of tamarin-ness, the mico becomes more difficult to locate, even as definitions and ways of knowing it expand.

Asking myself the question “where is the monkey,” I found my most literal answer in my first weeks of fieldwork. Scrambling inelegantly behind the reintro team as they lithely moved through the forest I stumbled upon not only the tamarins themselves but the source of tamarin data. An immense amount of data exists about these animals, information ranging from population growth to molecular genetics, and nearly all of it originates from this small team of people. Speaking of forest restoration, Mathews states,

in a real sense, a study of social and environmental change without an active and intransigent nature is a drama stripped of its principal actors. How can we make sense of the lives of people who struggle to make their livings from forests and fields if we do not pay attention to the material/ideological conditions of that struggle, if we end up saying that what really matters is their relationship with the state, with each other, but not with their fields and trees? [Mathews 2011:26]

I would add tamarins to the list, how people relate to field, trees, and tamarins, but also how tamarins relate to fields, trees, and people. The monkeys are most assuredly a principal actor here. And though the relationship of the tamarins to trees and forests is critical to their long term survival, their relationships with people, especially those people who have dedicated their lives to GLT conservation, indelibly shapes the way that tamarins exist within their habitat. The tamarin that re-enters the forest is not precisely the same as the one that left. The field team, through processes of observation and data collection, has amassed a wealth of information that scientists in turn use to create a very clear picture of a tamarin. This highly visible animal, visible down to its most intimate details of genetics, has replaced the dwindling and poorly understood population of the 1970s and emerged, nearly triumphant, as the tamarin of the future.
Throughout the rest of my field research (the majority of it), tamarins were out of sight, far from center stage, but not out of mind. As “any historical narrative is a particular bundle of silences” (Trouillot 1995:27), tiny golden monkey gives impetus and shape to the conservation of the Brazilian Atlantic Forest in Casimiro de Abreu and Silva Jardim even while the animal itself remains quietly tucked into the woods. This chapter has illuminated the research and data collection process that anchors all of the conservation work described in the preceding chapters. The charisma of the golden lion tamarin has pulled the species itself up from the brink of extinction, and now continues to support broad-based conservation efforts that are vital to the survival of the Atlantic Forest habitat. In addition to this intimate portrait of the seemingly simple, daily work that is at the foundation of one of conservation’s most remarkable success stories, this chapter has ventured below the surface of the weights, measurements, and notations that comprise the decades of tamarin data to suggest important questions about what happens (to the monkeys, to the forest) when tamarins are quantified and cataloged then inserted back into the forest through conservation efforts. Although the first reintroduction of the tamarins back into the forest was compared to a homecoming (for example, in The Golden Lion Tamarin Comes Home, a children’s book by George Ancona), exiles finally returning to their native land, both this chapter and the preceding ones have shown that for these animals, living on islands of habitat surrounded by bureaucracy, politics, social movements, and conflicting ideas about the meanings of land and conservation, it is not as simple as righting a wrong and resetting the clock to the days of tamarin abundance. Tamarins, people, forest, and agriculture are embroiled in deep and inescapable new relationships as they move together into the future.
CONCLUSION, Too close for comfort

Golden-headed lion tamarins (*Leontopithecus chrysomelas*) are endemic to a small area of the state of Bahia. They are almost identical in size and shape to their golden lion tamarin cousins except, as their name suggests, for their coloring. The golden-headed lion tamarin (GHLT) has a black body with a golden mane, gold-sleeved arms, and a golden tail. The entire wild population, estimated at 6,000-15,000 animals, lives in an area of less than 20,000 square kilometers between Salvador and Porto Seguro along the Atlantic coast of the state of Bahia. All, that is, except for just over a hundred individuals that live in Niterói, a city on the outskirts of Rio de Janeiro.

Golden-headed lion tamarins were first spotted in Serra da Tiririca state park in Niterói in 2002. A survey of the park’s GHLT population in 2009 found 107 individuals. The golden-headed lion tamarins are thriving thanks to the large, well preserved habitat supplemented by regular feeding by delighted park visitors (Kierulff 2010). They are, however, more than a thousand kilometers away from where they are supposed to be. They were released into the park accidentally by a private collector (Kierulff 2010), and, as I will explain further below, their sudden appearance complicates the already precarious situation of the golden lion tamarin.

As this dissertation has discussed, animals can be tightly bound to, even representative of, particular places. An animal out of place disrupts the human perceptions of that place just as surely as the “right” animal comes to define it. My perception of the quiet city block where I live would alter if my neighbors all began walking cows down my street. Not that there is anything wrong with cows, but they do have context. This first example makes only the simplest point about context, but for hundreds of years animals have been important players in global
networks and major figures in the colonization, reshaping, and reimagining of landscapes. As people and products traverse the globe with frequency and ease, so too do plants and animals. Transplanted species can become simultaneously economically important and conceptually disruptive. Anthropologist Marianne Lien discusses the introduction of Atlantic salmon to the Australian island of Tasmania and the way that the salmon link two distant places, thus challenging ideas about boundaries and belonging (Lien 2005). Salmon were imported to Tasmania become a commercial, farm-raised fish. Although the fish “fail to inhabit the category of native species that would legitimize their presence within what is seen now as a pristine, unspoilt Tasmanian nature” (Lien 2005:669), the salmon industry is important to the Tasmanian economy. Salmon are ultimately ideologically problematic, important to the contemporary economy by not native.123

Animals can proliferate in new places without obviously challenging the integrity of the original environment. House Finches in the eastern United States, for example, flit about alongside local sparrows without attracting the attention of the lay-viewer because, as transplants from the west coast of the country, their presence is not too incongruous (as opposed to the famous Quaker Parrots of the South Side of Chicago that are quite clearly tropical and non-native.) Geographer Kay Milton explores a campaign in the U.K. to get rid of the North American ruddy duck124 and suggests a set of cultural boundaries that give shape to the campaign: species distinction, alien versus native, and human versus non-human processes of species arrival (Milton 2000). If salmon are a problem in Tasmania and ducks a problem in the U.K., then golden-headed lion tamarins are doubly so in Rio de Janeiro. Lion tamarins are a natural part of the Brazil Atlantic Forest, just not these lion tamarins, not in the southeastern corner of the forest at least. Of Milton’s three boundaries, the golden-headed lion tamarin
disrupts the last most loudly, having been released into Rio de Janeiro state by a careless animal collector. Enchanted visitors to the Tiririca Park do not seem perturbed by the black and orange variety, and the GHLT is, in fact, a rare, endangered species (IUCN 2012). Unlike the invasive common marmosets discussed in chapter 3, the golden-headed and golden lion tamarins are both equally “valuable” from a conservation standpoint, both endemic to a single state in the country. For conservationists, “removal of alien speices is not the overriding consideration” when it conflicts with biodiversity conservation “which requires them to value species, above all, in terms of their rarity and vulnerability to extinction” (Milton 2000:239). The golden-headed lion tamarin, a rare and emblematic species placing pressure on another rare and emblematic species, inspires a sensation of conservation cognitive dissonance by appearing well outside of their habitat range.

**Interlopers**

The golden-headed lion tamarins enjoy a park of 4,000 hectares of continuous forest. Compare this to the 10,600 hectares of protected forest, spread across two biological reserves and 21 private properties, available to the golden lion tamarin (Save the Lion Tamarins 2013). The AMLD is eager not only to rid the state of Rio de Janeiro of the GHLT, but also to explore the possibility of reintroducing GLTs to the park (Kierulff 2010). As discussed in the preceding chapters, the golden lion tamarin’s future survival is dependent on nearly 15,000 additional hectares of protected forest (more than twice what is currently protected), and also connections between the scattered connected areas. The presence of GHLTs at Serra da Tiririca is a stark reminder of the premium on existing Atlantic Forest space. The new tamarins are essentially shutting the original tamarins out of important potential habitat range.
Greater even than the insult of the interloper taking over prime real estate is the threat of hybridization between the two species. The closest golden lion tamarins are 50 kilometers from the GHLT groups. This is a fair distance for a squirrel-sized monkey, but not far enough to eliminate the very real possibility that the two species could find one another and interbreed, thus damaging the genetic stock of both of these endangered primates. The popular conception of species is of something fairly fixed, or at least certain, when in actuality neither of these is true. Rather, “classification is a scientific hypothesis, subject to modification if new evidence comes to light or if new understandings are brought to bear” (Groves 2000:12). Species are made and unmade through discovery and extinction, true, but also through reordering, shuffling, and decision-making among scientists as new evidence is collected and new facts emerge.¹²⁵

Conservation policy and practice may also dictate the fate of species designations. In the U.S., the discovery of genes from Central and South American cats in Florida panthers led to the decision by the government to release a Texan subspecies of panther into the area as well, to improve the overall panther population (Simberloff 1998:250). While no one in Brazil has suggested that conservationists abandon the distinction between the four lion tamarins, the implication of the Florida example is that once species purity is damaged it can be politically difficult to recover.¹²⁶ If the GLT and GHLT did interbreed their classification (and thus conservation) as two separate species might bear reassessment.

Classification of a group of animals as a species versus a subspecies has very practical implications. In June 2013, the U.S. Fish and Wildlife Service (FWS) introduced a proposal to delist the gray wolf (*Canis lupus*) from the Endangered Species Act. The proposal includes a claim that the eastern wolf is a separate species from the gray wolf, and the reason for this distinction is that, in order to delist the wolves, the FWS must show that the animals have been
restored in their historic range. If the gray wolf did not historically exist in the eastern part of the country, the FWS has no obligation to protect it there and can delist it. In a similar spirit, the four lion tamarins are incredibly close genetically (Seuánez et al. 2002:118) and may have been classified as separate species, instead of merely subspecies, for conservation purposes (Rylands et al. 2002:5). If the four lion tamarins are separate species, there is a stronger argument to save all four. If the tamarins find each other and begin interbreeding, the conservation programs to protect the individual populations could lose ground. Hybridization can amount to the original species become, “effectively, extinct in [their] original form” (Milton 2000:231). Fear of hybrids is emblematic of the trend in environmental conservation toward “a vision of nature that highlights stability and spatial boundedness at the expense of change and movement” (Lien 2005:659). Lien goes on to explain that “although biologists generally agree that nature is in a constant state of flux, conservationists tend to preserve species that already exist, and prevent the emergence of new mixed varieties or hybrids” (Lien 2005:659). Conservationists in Rio de Janeiro quickly decided that the golden-headed tamarins had to be removed.

This latest episode in the struggle of the golden lion tamarin is interesting on a number of levels, not least of which is the fact that this is constructed as a dramatic problem for the golden lion tamarin, while the golden-headed lion tamarin is only a supporting cast member. The GHLT does not have an internationally known conservation program behind it as the GLT does with the AMLD. The golden-headed lion tamarin, as an endangered sister species, is treated with all due respect, but in the end it has transgressed important geographical boundaries and threatens genetic ones. Swift eviction is in order. Painstaking preparations, coordinated between a number of NGOs, were made for this delicate (and expensive) operation. The Instituto Pri-Matas (Primate Institute) began trapping the golden-headed lion tamarins in July 2012. As of
April 2013, 104 individuals had been trapped, an estimated half of the current population in the park. Of the captured tamarins, 66 have been released to a new site in Bahia, 24 tested positive for diseases and will remain in captivity to avoid infecting the wild GHLT population, and 17 remain in quarantine (Instituto Pri-Matas 2013).

Conservationists are sensitive to the popular appeal of the GHLT; how could they not be, having spent so many years working to integrate the GLT into popular imagination in the human-dominated landscape of southeastern Brazil? Part of the plan to remove the GHLT involves an educational campaign designed to elicit local support for the return of the Bahian tamarins to their home. A colorful pamphlet, titled A Caminho de Casa (The Road Home), features infographics that explain the tiny GLT population in terms of popular tourist attractions in the city of Rio: they would fill just 2% of seats at Maracanã stadium and would require 25 cable car trips up Sugarloaf Mountain if all of them wanted to see the view. Towards the end of the pamphlet, a comic strip shows a GHLT family packing their bags, boarding an airplane, and talking excitedly about the new, better life that awaits them in Bahia. It is not enough that scientists tell people that these monkeys belong elsewhere; they must construct an accessible narrative for the monkeys that convinces people that the monkeys would be better off somewhere else. Tamarins, golden and golden-headed, have popular, sentimental appeal, and the people living near them often feel emotionally invested in the well-being of the monkeys.

**Forests (and micos) of the future**

Chapter 2 introduced the concept of “designer ecosystems,” in which humans make the decisions about which species exist in a restored ecosystem, and such ecosystems might also entail “redefining what an invasive species constitutes” (Temperton 2007:346). In her article,
Temperton goes on to describe fellow ecologist Young D. Choi’s concept of “futuristic restoration,”

which acknowledges that the usefulness of historic ecosystems in an everchanging and unpredictable world is of limited value and that restoration has to keep up by taking global change into account in its concepts and goals. This does not mean we do not need to be concerned about invasive species, loss of diversity, habitat degradation, or global climate change but that we need to include them when we consider how to manage the earth’s ecosystems in the present and the future. [Temperton 2007:346]

The problem of the two lion tamarin species exemplifies the multi-faceted issues facing the GLT in a symbolic, interspecies “feud.” Politics, territory, land grabs, land inequality, entanglements with local people, all can (with an indulgent allowance for symbolic theatrics) be seen through this disorienting confrontation between golden and golden-headed lion tamarins.

This dissertation has asked the question, “cadê o mico” [where is the monkey], and the search for the answer has led from agricultural fields to Brazil’s legal history to restored patches of forest. Importantly, it has also explored the four decades of golden lion tamarin research and conservation, an intimate history that binds tamarins, people, and forests together. Tamarins are “good to conserve with;” they are formidable allies in the multi-faceted work of restoring and preserving the Brazilian Atlantic Forest and its stunning biological diversity. By looking carefully at and for the tamarin, we discover the interrelated political, social, and animal relationships that weave together to produce conservation in southeastern Brazil.

The sudden appearance, and proliferation, of golden-headed lion tamarins is an important reminder that conservation is a moving target. The world of “futuristic conservation” will have to accept not only the unpredictability of the “usual suspects” (endangered animals, shrinking habitat) but also the unpredictability of unpredicted actors (endangered non-local animals, agroforestry networks, and agrarian reform allies of the environmental movement). We may admire the adorable, rare, and endemic primate staring out at us from the tree branches, but can
we locate its future as we have located its past? Is the future range of the tamarin as clear to us as its historic range? Its future genetic makeup as well-plotted as the orderly studbook that keeps the captive population diverse and minimally inbred? The appearance on the stage of this second tamarin, rare in its own right but out of place here in southeastern Brazil, assures us that there is nothing set nor certain about the future of the tamarin and its forest. In the end, it is less important that we precisely locate the tamarin than that we spend the time searching for it in unexpected places.
Other biomes require different legal reserve. Amazon habitat requires 80% RL, cerrado 35%, and all other regions are also 20%. Unsurprisingly, this law often disobeyed.

The romantic view of nature as a place of spiritual regeneration strengthened with industrialization; people who have been systematically distanced from a connection with the natural world through industrialization and urbanization turn back to the “treatment of nature as social sanitarium, space of recuperation” (Smith 1996:43).

This will be discussed in more detail, but to clarify this point briefly, most of the extant forest (especially in the lowland areas) is not old growth but rather relatively recent regrowth after agricultural projects were abandoned.

I was not actually sure what commitment he was referring to, but 11% of Brazil’s land is protected, even if much of this area faces a persistent lack of funding and other support (Banerjee et al. 2009:135).

It was not clear to me whether the fine would be levied against the individual landowners or against the municipality as the responsible party.

Agroforestry systems in this region not only combine shade plants with food crops, they also take advantage of native species and local varieties of popular produce. Different species are planted together, rather than grouping all of a single kind of plant together so that soil nutrients are not sapped. Homemade fertilizers minimize chemical use. Seu Jovelino’s SAF looks like native forest, and indeed is indistinguishable from the reserve in satellite photos, but it is filled with produce that he continually harvests for local market.

The Poço das Antas biological reserve is actually just across the municipal border in neighboring Silva Jardim. The creek that defines the eastern boundary of the reserve is also the western edge of Casimiro de Abreu. Silva Jardim (the town) is 30 kilometers away from the entrance of the reserve and well off of the BR-101 highway. The majority of the employees of the AMLD live in Casimiro as well.

Lest it seem that Casimiro spent his whole life in this region I should clarify that he moved to the city of Rio de Janeiro as a young man then went to Portugal, where he wrote most of his poetry. He returned to Rio after four years and worked at newspapers there (alongside young proofreader names Joaquim Maria Machado de Assis for a time). He returned to the baixada litorânea in an attempt to recover from tuberculosis.

Dean suggests that on the dry inland plains of São Paulo, farmers might have been unwilling to plant shade trees that would compete with coffee for water, however he goes on to note that “unshaded groves were sooner senescent, they had to be weeded more frequently and aggressively, their yield fluctuated wildly from year to year, and the product was of lower quality” (Dean 1995:219).

The inefficiency of transportation was one of the few checks on rampant expansion of coffee agriculture deeper into the Atlantic Forest (Dean 1995:211). Improved transportation, which was comprised of both the railroad and the emergence of steamboats to replace sailing ships (Viotti da Costa 2000:217), both allowed landowners to transport goods to market and opened up new areas to exploitation.

Each time the sede changed, the name of the municipality changed with it, from Barra de São João to Indaiáçu to Barra and finally, in 1938 (thirteen years after the town changed its name) to Casimiro de Abreu. Some animosity still persists between the two hamlets. While I was in the field in 2010, Barra was making some noise about wanting to leave the municipality of Casimiro
de Abreu to become part of Rio das Ostras, the municipality immediately to the north whose eponymous county seat is less than 10 kilometers up the coast from Barra (Casimiro is close to 40 kilometers away). Also, between the prefect and vice prefect of the municipality, one is traditionally from Casimiro and one from Barra. The current pair had had a falling out, with the vice publishing an open letter in the local paper titled *Tem algo de podre no reino da Dinamarca!* (something is rotten in the kingdom of Denmark). I do not think that the prefect spat was related to the rumor of Barra’s secession-grumblings, but I found the headline hard to ignore.

In the United States as well, the advent of the railroad heralded a period of unprecedented access to “unexplored” wild lands. In his classic work on the American Beaver, Lewis Henry Morgan observed that the construction of the railroad into the Great Lakes region opened the wilderness where, “the beavers were surprised, so to speak, in the midst of their works, which, at the same time were rendered accessible for minute and deliberate investigation, in a manner altogether unusual” (Morgan 1986:8).

Animal underpasses do exist, for deer in the United States and for koalas in Australia, for example. Underpasses require fencing that guides animals away from the side of the road and towards the designated crossing point, and the placement of the underpass must take into consideration existing routes traveled by the target species (Queensland 2000:30). Animals, such as golden lion tamarins, who move primarily arboreally, do not use underpasses, and overpasses are extremely costly and as yet untested (Queensland 2000:37).

This is not to suggest that only hunters make connections between their use of natural resources and the regenerative capacity of the natural system. Brazilian judge Baltasar da Silva made a study of the Atlantic Forest late in the eighteenth century and concluded that “the replanting of native hardwoods in homogeneous stands was neither economical nor ecologically feasible and that the supply of ships’ timber could be sustained only through the careful management of existing forests, including selective logging and encouragement of the regeneration of tree species of greatest value” (Dean 1995:136). Unfortunately, as Dean points out, loggers were disinterested in this sort of observation.

In the state of São Paulo, too, a law was enacted against the killing of songbirds, a practice engaged in primarily by Italian immigrants in both Brazil and the United States (Dean 1995:231).

Wildlife managers in the contemporary U.S. also see an obvious and important link between the preservation of wildlife and wildlands with hunting (Lawson 2002).

Contemporary conservationists are more sensitive to the fact that hunting often serves cultural and subsistence purposes. However, programs to alleviate the loss of meat not only fail to address the cultural loss, they often make less economic sense than hunting. For example, wildlife farming has been suggested in tropical forest areas as a way of allowing local people to sustainably grow wild animals for food. Beyond the animal health and law enforcement issues created by such a scheme, it also fails to make economic sense. Researchers at the Wildlife Conservation Society came to the conclusion that, “until wildlife numbers in the wild become so low that it is no longer worthwhile hunting them, wildlife farming is unlikely to reduce hunting, due to the high costs of farming compared to hunting” (Mockrin et al. 2005).

Conservation strategies continue to edge the rural poor out of lands they have traditionally used for subsistence. Even in contemporary Africa, “in areas designated for hunting, quotas and
licenses favor the wealthy and urban citizens over the poor and rural people” (Gibson and Marks 1995:944).

19 This was also the case in British-ruled Africa, where in the view of the colonial state, “white ‘sport’ hunting and nature preservation went hand in hand, while traditional African hunting was antithetical to preservation” (Neumann 1998:35).

20 According to the 2010 census, indigenous peoples comprise just .23% of the population of Casimiro de Abreu and less than .1% of the population of neighboring Silva Jardim (IBGE 2010).

21 Brazilian federal law 9.605/98, article 29 states that anyone who kills, hunts, chases, or traps wild animals, whether they be natives or not, will be subject to six months to one year in jail and a fine. The penalty may be increased by half if additional criteria are met, such as hunting: of an endangered species, at night, or within a unidade de conservação (conservation unit,) which includes national parks, biological reserves, private legal reserves, and áreas de proteção ambientais (environmental protection areas.) Penalties are tripled for professional hunters. The same crimes would have earned two to five years under the Fauna Protection Act of 1988 (Benjamin 1998:230).

22 Cartmill attributes this change in attitude towards hunting as a product of changing class relationships in the 1500s. Hunting in the previous century had been monopolized by the aristocracy, but “opposition to hunting was a middle-class phenomenon, which expressed a bourgeois rejection of aristocratic values” (Cartmill 1993:85). Class conflict symbolically represented through debates about who should have access to natural resources and what they should be allowed to do with that access carries into 20th century discussions of hunting rights in the U.S. (Jacoby 2001, Warren 1997).

23 Even legally protected land in Brazil has historically lacked the government resources for adequate protection, leaving these areas open to hunting, logging, and collecting. Dean suggests, “the government was sometimes a partner in these activities, since it was in effect cheaper to expend its own resources than to pay to expropriate the resources of others” (Dean 1985:65). He goes on to attribute the loss of two important areas of primary forest to “the connivance of government officials” in the 1950s (Dean 1985:66).

24 According to article 27 of federal Forest Code of 1965, fires must be adequately controlled and damage to protected areas can be punished with fines or jail time. A 1998 edict (2.661) established standard precautions for the use of fire, including obtaining authorization for controlled burns.

25 A major component of Nadasdy’s argument is to push back against the instinct to view native understandings of the world as metaphorical. He cautions against suggesting that the Kluane First Nation of the Yukon think animals are “like people” or that human-animal relationships are merely projections of human-human social relationships. Instead, “for them, animals are people. This does not mean that they cannot distinguish between human people and animal people […] There are many different kinds of people” (Nadasdy 2007:31). Taking seriously this worldview “necessarily entails rethinking many of the most basic concepts of social theory: personhood, agency, knowledge, power, labor, exchange” (Nadasdy 2007:26), and while Nadasdy is interested in hunting relationships in particular, this theoretical challenge is useful for thinking through human-animal relationships more broadly as well.

26 Maintenance of a restored area even be might needed for a full two years to ensure the success of the planting (Rodrigues et al. 2009:1247).
This is not to suggest that no government efforts to protect forests occurred prior to the 1970s. For example, Itatiaia, in western Rio de Janeiro state, became the first national park in 1937 (Dean 1995:63) and reserves also were created on the state level.

During one of our conversations, Samuel noted that people are often unimpressed with the slow growth of the forest, especially with the more “natural” techniques that use fewer pesticides and chemical fertilizers to speed the process. The AMLD wants the forest to be usable for the tamarins, and that can take many years. Other stakeholders also fail to appreciate the very gradual process of forest restoration, approaching the practice with a mentality of quick deforestation, quick reforestation.

Ribeiro et al. estimate remaining forest cover at closer to 11% (possibly even as high as 16%), but this is not exactly good news for the forest as what remains is divided between more than 245,000 forest fragments. Though the largest of these fragments extends from São Paulo to southern Rio de Janeiro and alone represents 7% of the remaining forest, more than 80% of the remaining forest exists in patches of less than 50 hectares. In its current state the “conservation network is insufficient to support the long-term survival of this rich and endangered tropical forest” (Ribeiro et al. 2009:1151). In other words, it is not enough to consider the area of the remaining forest, the location and connectivity of the fragments is key.

Human population concentration in coastal areas is not unique to the Atlantic Forest region or even Brazil. More than half of the U.S. population lives along the two coasts of the country, a percentage that is expected to rise (NOAA 1998). Worldwide, more than 40% of the human population lives on the coast (IOC/UNESCO 2011:9), and low elevation coastal areas are particularly populous (Small and Nicholls 2003:595). The emphasis I place on this fact is not meant to suggest the Atlantic Forest ecosystem is uniquely burdened by human presence, though the area between São Paulo and Rio de Janeiro is the most densely populated coastal region in the world (Hinrichsen 1999:28), but to establish a contrast between the Atlantic Forest and the more well-known, and sparsely populated, Amazon Forest region.

Dean suggests that, “nearly all of the physical and economic transformations of the 1950s and the 1970s that might be called development were confined to the region of the Atlantic Forest” (Dean 1995:266).

Before it became the União biological preserve in 1998, the Fazenda União belonged to the Leopoldina Railway Company Limited, a British company, and later the Brazilian owned Rede Ferroviária Federal S/A. The railroad companies used the fazenda to supply fuel wood (Visite Casimiro 2013). This history is visible in the forest by the abundance of eucalyptus that grows on the reserve, and the management plan for the reserve includes a strategy to eliminate the eucalyptus and restore native vegetation (ICMBio 2008:55).

Eucalyptus is used commercially for paper and pulp as well as material for floors, cabinets, and other construction in green building projects, thanks to the ease with which it can be grown in sustainable, plantation settings.

The premium on this kind of information dates back to the time of colonization when, “the necessity to evaluate the nation’s territories raised the social status of the engineer, as consultant for the enterprise of public works, and holder of the statistical knowledge required for monarchic centralization and the structural formation of the nation state in Brazil in the mid–19th century” (Duarte 2004:42). Maps are not simply way-finding pictographs; as discussed in the introductory chapter and in the proceeding chapter 3, maps are critical tools in the work of nation building and key arguments in the discussion of legal landholding in Brazil.
Showing a slightly different take on views of nature and progress in the same era, Feeley-Harnick suggests that, “[Lewis Henry] Morgan’s beaver research shows how the generative imagery of land and water was incorporated into the new landforms associated with the railway” (Feeley-Harnick 2001:79). Morgan and other mid–19th century contemporaries may have thought about railways (critical to the rise of Chicago) as nearly as organic as landscape features like rivers.

The Brazilian Senate has a nice infographic illustrating the Forest Code rules, www12.senado.gov.br/noticias/infograficos/2012/10/info-novo-codigo-florestal

Neither a “non-profit sector” on par with that of the United States nor the philanthropic tradition that supports it exists in Brazil (Hochstetler and Keck 2007:101). The relatively new and diversely defined field of non-profits in Brazil emerged historically out of colonial patron-client relationships, the influence of the Catholic Church, and a variety of mutual aid societies and other civil associations that flourished from the 19th century onward (Lindam 1997). Conservation NGOs emerged in earnest in Brazil in the 1980s and 1990s, including some grant-making foundations (Mittermeier et al. 2005:604).

During a visit into the neighboring community of Quete (described in more detail in chapter 4), an AMLD employee asked community members to name environmental groups they knew. The only one they could think of without prompting was IBAMA, whose job was “to arrest people and served no educational purpose at all.” (fieldnotes, April 27, 2010).

The RPPN program is available to landowners with the means and the desire to take part in forest restoration and habitat preservation, but by and large “restoration in Brazil is virtually always part of a legal and compulsory process, all investments are of landowners’ liability […] and they generally are economically unfeasible to many landowners” (Rodrigues et al. 2009:1246).

Fire is a major topic of debate in conservation and is also frequently, and negatively, discussed by conservation and government authorities in Casimiro.

Resistance by the landed class to environmental laws dates back to the colonial years when the Crown claimed a monopoly over hardwoods until well into the 19th century (Dean 1995:161).

Ashworth’s discussion is of the built environment, but he notes, “there is a direct parallel in approaches to the natural environment, which was treated for many millennia as usable space, most obviously for food production.” The view of usable space “was supplemented and at least partially replaced by the aesthetic concept of nature to which many non-utility attributes were ascribed” (Ashworth 2011:3).

Ants are not a new problem in the region, nor one limited to conservation projects. In the late 19th century, coffee planters were plagued by colonies of the saúva ant that seemed impervious to poison, fire, and explosives and which destroyed large amounts of crops (Stein 1985:216). These losses were compounded by losses to other animals and insects (Dean 1995:193).

The consistent problem of lack of appropriate tools or enough tools, both at the AMLD for conservation projects and within the local agrarian reform farming communities, is reminiscent of a pattern in Brazil. In the early 19th century slaves often had only machetes with which to work the fields (Dean 1995:195) and at European agricultural expositions in the mid–19th century, the Brazilian delegates still had only the most rudimentary tools to display (Dean 1995:226).

As examples of the historical and topical range of discussion of scientific management: in the 19th century scientists and explorers brought samples of neotropical vegetation to Kew Gardens
for study and observation, and in contemporary media debates rage about culling of “problem” species like wolves or African elephants.

46 In southeastern Rio de Janeiro state you do not find the gaucho (cowboy) culture of southern Brazil, but the love of meat is strong. The cuisine here is dominated by the churrasco, barbecue that consists of slabs of meat pressed into a plate of salt then grilled and served beside a plate of white rice, French fries, and watery black beans.

47 Alex expressed the additional frustration, one shared by the conservation educators, of trying to explain not only the difference between native and non-native species but also the importance of distinguishing regional species. Even plants that grow well here, and are native to other areas of the Atlantic Forest, might not necessarily qualify as native to the local ecosystem. The same holds true for animals. The Golden Lion Tamarin is one of four lion tamarin species (discussed further in chapter 3), each found in a distinct segment of the Atlantic Forest.

48 To some degree or another, all animals make an impact on their habitat. The scale of that impact, however, can differ widely. The beaver, for example, manipulates the environment more dramatically than any other mammal besides the human being, an attribute that contributes to Morgan’s interest in the animal in his classic mid–19th century work of natural history (Morgan 1986 [1868]). Tamarins do not alter the Atlantic Forest on a scale comparable to the beaver, but their feeding habits and use of a broad territory give them more influence than other animals, a sloth for example, that is more limited in range and habits. The case of the tamarin is also interesting because they have been “enabled” by people, set-up through tailored forest restoration and conservation policies to exert a strong influence over their forest habitat.

49 There, of course, a few people who think I am talking about tamarinds, the African fruit.

50 This is not to imply that Brazilians are all innate naturalists. Gilberto Freyre, “pointed ironically to his fellow Brazilians’ tendency to refer to any creature as, simply, a bicho (animal),” and, inclusive of rural Brazilians, Freyre’s discussion of the environment in his seminal work The Masters and the Slaves argued that, “the Portuguese, in contrast to Indians, had no tradition (or not for several hundred years) of closeness with the environment” (Rogers 2010:63). These observations are not incompatible with my own about the Brazilian interest in nature. As this chapter will develop, animals can be simultaneously everyday and extraordinary.

51 The word mico in Portuguese covers tamarins and marmosets and in terms of common parlance is perhaps best translated as “little monkey.” Most Brazilians, including those who work at the AMLD and have a vested interest in the mico-leão-dourado (golden lion tamarin) as opposed other small monkeys like the mico estrela (common marmoset), use the term mico with frequency with no attempt to distinguish between the numerous genera within the family Callitrichidae. Micos come in different colors and sizes but are, for all intents and purposes, a single group. (Consider, by comparison, how Americans think about squirrels, although the red variety is a distinct species from grey and black.) Throughout this chapter and dissertation I will use the word mico with all of its broad implications because this most accurately reflects the way people in Brazil think and talk about monkeys.

52 Squirrels and monkeys have been compared in physical anthropology as well. At the beginning of the 20th century, scientists attempting to explain unique characteristics of primates, especially enhanced vision and prehensile digits, came up with the “arboreal theory,” which suggested that these adaptations were a response to increasing time spent in trees. Anthropologist Matt Cartmill later pointed out that tree-living animals did not necessarily adapt
these traits. Squirrels, for example, live quite successfully in trees without the advantage of primates’ stereoscopic vision and gripping hands and feet (Bernard and Loy 2000).

53 Other animal species, such as the *Arara azul* (Hyacinth macaw, a large Amazonian parrot) and the *Onça pintada* (jaguar), also have iconic status in Brazil, though the golden lion tamarin is probably the most widely known endemic icon.

54 Rural people in Africa frequently lose significant quantities of crops to animals (Gibson and Marks 1995:944). Not only does the proximity of human agriculture naturally attract animals, the influx of tourists to nature preserves creates rich foraging grounds in the form of garbage and occasional intentional feeding. As anyone who has gone camping in the U.S. knows (or, indeed, anyone living near a forest), keeping food away from opportunists like bears and raccoons is an important preoccupation. Human garbage at wildlife preserves in Africa also attract animals like baboons (Sapolsky 2001), to the detriment of both the animals’ health and to local farmers.

55 Two infamous examples of conservation related conflict are the murders of Dian Fossey in Rwanda in 1985 and American nun Dorothy Stang in the Brazilian Amazon in 2007. From western North America and Alaska to South America to Asia to Africa, the stakes for control of land or access to resources can be high. Conservation requires that some “unused” lands remain undeveloped and this puts it immediately at odds with developers, politicians, miners, and others who are unhappy to see miss the chance for profit (or the chance for survival as is often the case for poorer farmers).

56 The “violence” that does exist in this region is more in line with the struggles and resistances described by historian Karl Jacoby. Speaking of game and timber poaching by rural people in the U.S. in the early 20th century whose customary subsistence behaviors were criminalized by the formation of National Parks, Jacoby observes, “conservation thus did not so much eliminate violence as redefine it, with the legitimate exercise of violence becoming the sole prerogative of the state, and rural folk resorting to violence as a potent but illegal way of resisting or reshaping the new conservation order taking place in their midst” (Jacoby 2001:195). Aside from some armed confrontations, local people expressed violence against the new bureaucratic order with persistent subversion of the law, hunting where and when they were not supposed to and taking firewood and other resources from the forest without permission.

57 Perhaps coincidentally, the late biologist Devra Kleiman contributed substantially to advances in captive breeding and conservation of both the panda and the GLT. For more on Kleiman’s work see Kleiman & Rylands 2002 and Brown 2010.

58 Restoration has always been a part of the AMLDs work; even the Poço das Antas reserve had to undergo major restorative efforts. But without the space for more tamarins, finding more reserved areas and connecting these patches to one another has become critical.

59 A more detailed discussion of the extent of the difference between the *Leontopithecus* species and the politics of species distinction will be addressed in the Conclusion.

60 The Atlantic Forest is so diverse, in fact, that “our current knowledge indicates that this complex biome contains a species diversity higher than most of the Amazon forests” (Colombo and Joly 2010:698, see also Brooke 1993; Morellato and Haddad 2000). This is not some sort of value judgment by an advocate of the eastern tropical forest but rather a fact of forest succession. As time passes and a forest ages, the early and mid-level species of plants die down and are replaced with the “climax” forest. The Atlantic Forest still contains vegetative growth of numerous stages, thus not only housing more plant species but also more varied habitat niches for animals.
National parks were created in Brazil in the early part of the 20th century, to “protect extraordinary landscapes, but an awareness of the need to conserve Brazil’s wildlife was still incipient until the first half of the 20th century” then “from 1976 through the 1990s, Brazil made an enormous commitment to parks and other protected areas at the federal, state, municipal, and private levels” (Mittermeier et al. 2005:601).

At the end of April during my time in the field, the organization received word that Devra Kleiman, founding member of this passionate international group of tamarin devotees and celebrated biologist, had succumbed to cancer. Kleiman’s career included not only the monumental political and biological achievements involved in the GLT program but also decades of study of the reproductive behavior of the giant pandas at the National Zoo (work that ultimately led to the birth of a healthy cub in 2005). Some of the AMLD staff, those that had been with the project almost since the beginning, knew Devra intimately. The newer staff never met her, but knew her name from the numerous books, papers and studies that shape their daily work.

A New York Times article in 1986 ran a short piece about the GLT studbook with the playful title “Single Golden Lion Tamarin Seeks to Meet…”

In 1989, Devra Kleiman estimated the cost of the Golden Lion Tamarin Conservation program at more than $120,000 per year, without including the researchers’ salaries nor any in-kind costs of participating zoos, the Rio de Janeiro Primate Center or the Poço das Antas reserve management. She also noted that “the tamarin program is no unusually expensive” (Kleiman 1989). Oates (1999) estimated the cost of reintroduction at $22,000 per surviving tamarin and questions whether captive breeding programs ultimately do more harm than good by (expensively) allowing for the neglect of wild populations (Oates 1999:213).

The necessary intensity of tamarin support suggests an interesting comparison to the support of the AMLD and other NGOs for small farmers, referenced in chapters 2 and 4. Perhaps it is reasonable to think that people also require help to transition into this new relationship between human, forest, and animal.

Tamarins generally occur in areas of 300 meters above sea level or lower (Rylands 1993:296).

“Charismatic megafauna” is a common term in environmentalism that refers to large, recognizable animals – lions, tigers, whales, pandas – that are useful as flagship species. While discussing my project during a meeting of the animal studies group of the Social Sciences Research Council’s Dissertation Proposal Development Fellowship Workshop in 2008, Harvard historian of science a session co-organizer Janet Browne referred to the tamarins as “charismatic mini-fauna.”

Towards the end of my time in the field, I learned from one of the members of the reintroduction team, that when the tamarin project first started the biologists were not yet aware of that the animals were territorial. I found this fact striking because now this fact is so germane to the entire conservation program. A small reminder that facts are constantly evolving, and methodologies evolve alongside them.

Technically, I should say “Mogwai-like” face, in reference to the cute little creatures of the film Gremlins before the turn into the reptilian like gremlins.

He is very explicit in his assertion that “although the charisma outlined here is resolutely anthropocentric – it emanates from the human body – it does not elevate nonhuman organisms to the humanist status of subjects” (Lorimer 2007:927). I felt that this distinction was important to note here as the late professor Neil Smith expressed concern during my second exam about the
growing literature ascribing “agency” to animals and as a result putting the struggles of creatures like oysters on par with those of people (Haraway 2008) to the detriment of social movements, etc.

Today, arguments for biological affinity are perhaps simplest with primates as they share genetic similarity to people. But prior to the advent of genomics behavioral similarities were important points of comparison. For example, Lewis Henry Morgan’s “arguments about relations between animals and people rest[ed] on his efforts to relate human vocal-auditory speech with other sign systems” (Feeley-Harnick 2001:75). Diurnal primates like the tamarins share a daily schedule in common with human beings as well, “feeding and moving are concentrated during the morning and afternoon hours, and resting peaks at midday – a pattern that is common in many species of primates” (Kierulff 2002a:183) and indeed, common in the human primate as well.

Rarity as a valued quality is neither limited to animal species nor is it a new concept. In the 19th century, Europeans prized the exotic orchids of the Atlantic Forest and “more important to European collectors than the beauty, fragility, and exoticism of the epiphytes was their rarity. Rarity, to put it crassly, raised their price” (Dean 1995:164).

The corridors that I discuss here are those connecting small patches of forest in this one region. This is distinct from the large-scale Serra do Mar corridor project that attempts to connect huge, interregional segments of Atlantic Forest.

At a strategic planning meeting of the AMLD, the reintroduction team explained that in January 2009 their team had had their own strategic planning session at which they re-named the program as the metapopulation program and defined the seven population groups with whom they now work (fieldnotes November 2, 2010.)

Beyond the classic, environmental anthropologist’s discussion of the anthropogenic forest (referencing Edmund Leach and Hugh Raffles as examples), Mathews is concerned with “multiple nature-cultures”, with the idea that “Pine forests and silver mines are socionatural actors with particular kinds of livelinesses and resistances; they come into history in ways that affect what kinds of natures or cultures they are woven into” (Mathews 2011:90).

See Appendix B for the full Portuguese text of the letter.

Despite the wry label, the association does not take lightly the very real problem of perception of the GLT as a pest. Other internal notes and memos went on to discuss how to respond to this complaint. Overall, the AMLD has positive relationships with the surrounding communities, relationships that have been carefully and purposefully cultivated over the years in deference to the recognized importance of the local population to the success of conservation projects.

Mathews describes a protracted discussion in a northeastern district of Mexico over a forest fire in 1942 on the border between Ixtlán and Atepec in which officials of the former appealed to the government for help, blaming the fire on the latter. “The authorities of Ixtlán probably knew very well that neither the state government nor the forest service had the manpower to help them fight the fire, and they were probably more concerned with strengthening land claims along a disputed boundary with Atepec (Velasco Pérez 1987)” (Mathews 2011:106). All by way of say, Brazilians are not alone in the construction of creative legal arguments to strengthen land claim disputes.

Anxiety about maintaining legal control over land is not limited to private landowners feeling threatened by conservation. Federal employees in the U.S. feared that government owned reserves, without proper policing, would be understood as common property, and “to remain
inactive in the face of widespread timber poaching from public lands was, according to such logic, not only to risk ecological disaster but to encourage movements that might question the prevailing conceptions of law and of property” (Jacoby 2001:169). From the point of view of both the government and individual landholding citizens, conservation is tightly bound to perceptions of property.

The Poço das Antas reserve was put together with lands from three fazendas, large farms. “Antas” are tapirs, an odd-looking four-legged animal with a large, prehensile snout. I asked one of the conservation educators at the AMLD if there were any tapirs at Poço das Antas. She told me no, there were not, nor had there ever been, tapirs in this area. She had heard that one of the fazendas was called “Poço Dantes” (Dante’s Well) and the name mutated.

Though technically limits existed, nobles could easily amass a number of land grants through the names of friends and relatives, and the Portuguese crown did not show interest in curtailing this behavior. Observed Warren Dean, “it was a major cause of the destruction of the Atlantic Forest that the government assigned no value to the land it so freely granted. Having consumed all the most promising primary forest in a given sesmaria, a grantee commonly sold it off for a trifle and asked for another” (Dean 1995:147).

Possession of slave labor “in adequate amounts” was also a requirement to qualify for a sesmaria (Stein 1985:55).

Land use also impacted the taxes on land. In the late 19th century, “several states imposed land taxes, not only for revenue but also to stimulate intensified farming practices”. A tax in the state of Minas Gerais on “unproductive’ land was an important cause of deforestation as landowners circumvented it by burning down forest to simulate farming or ranching activity” (Dean 1995:216).

Though close to 85% of the agriculture in Brazil is made up of family farms, these small producers control less than one quarter of the agricultural land in the country and they produce primarily food stuffs for local and national consumption, such as manioc, beans, and corn (MDA 2006).

For more on the role of domestic plants and animals brought to the New World by Europeans (biological colonization) see Crosby (1972) and Russell-Wood (1992, chapter 5.)

In retrospect it seems somewhat amusing that I was so taken off-guard by Vigier’s comments. I had been to Brazil before, I was familiar the myth of “racial democracy,” and I was keenly aware (how could one not be?) of the visible racial skew between the upper and lower classes. But never before had a complete stranger taken me under his wing to mutter about people of German descent in opposition to the kind of people who take hand-outs. Though race has nothing to do with it. Maybe, as a brown American, I was simply stunned to be so easily viewed as part of the majority.

There is a lot of oil off the coast of Rio. Taxes from offshore oil platforms directly benefit coastal states and municipalities. Early in 2010, Casimiro was involved in a local Movimento em Defesa dos Royalties (movement in defense of royalties,) protesting the government’s proposal that the oil money should be redistributed to benefit the poorer, interior states. Development of oil wells deep below the ocean floor was underway at the same time, just as the southern US coast was reeling from the Deepwater Horizon disaster.

Vigier actually went so far as to compare IBAMA with the Third Reich, the former’s crime, enforcing outdated environmental laws.
The farmers and the agricultural extension workers in Casimiro often pointed out the fact that without their hard work in the country, the city people would not eat. The cover image on the Facebook page of one assentamento (yes, they have a Facebook page) reads, “Se o homem do campo não planta, a cidade não janta” [If the man in the country doesn’t plant, the city has no dinner].

See chapter 3 for more details about the peculiarities of Brazilian legal history that make this a particularly effective method of acquiring land.

The fourth settlement was involved with the AMLD for many years and relationships between the two communities were fine as far as I could tell, but not a lot of forest restoration or agroforestry projects were taking place there at the time I was in the field.

A 1999 report by the Empresa Brasileira de Pesquisa Agropecuária (Brazilian Agricultural Research Corporation, Embrapa) suggested that close to half of the lots were not suitable for farming and the 41 families living on them should be relocated (Ramos et al. 1999). However, when I was in the field there were still about one hundred families in the settlement, so I do not think any action was taken as a result of the report’s recommendations.

INCRA, the government agency that manages agrarian reform, must first purchase the land where people are camped before they can redistribute it. If they are unable to attain rights to the land they might acquire a different plot of land and move the acampados there. Other methods exist for moving onto the land as well. The assentamento across the highway from Poço das Antas was ceded to a local rural syndicate by INCRA in a much less polemic process than the MST camping method.

Above and beyond the politically fraught process of legalization of an acampamento, which can make the residents very suspicious of outsiders, Autaz-Mirim has had bad luck dealing with officials. In the early 2000s, a technician from another government agency, EMATER, came to the community and convinced the community to switch from the shallow-rooted crops they had planted to crops with deeper roots. This advice proved disastrous, completely wrong for the soil type. The crops failed, putting many of the residents in debt. A particularly heavy rainy season followed, flooding the entire community and washing away any evidence that the technician’s advice had been at the root of the crop failures. The residents resolved to start over. But in the late 2000s a worse rainy season and worse flood washed through Mirim. An employee of CEDRO told me that there is footage of residents being rescued by helicopter. Many of those in the legally settled half of the settlement had to leave (fieldnotes, September 22, 2010).

Temperton goes on to suggest that “socioeconomic limitations to restoration need just as much attention as abiotic and biotic ecological limitations” (Temperton 2007:346).

In Casimiro, NGO and municipal employees widely cited 80% as the amount of income that had to be derived strictly from the assentamento lot. Though in context I understood 80% to be some kind of law, Carol clarified that this is just INCRA’s suggestion, not the letter of the law. This suggestion likely emerged from law 4.504 of November 30, 1964, which defined a family farm as “o imóvel rural que, diretamente e pessoalmente explorado pelo agricultor e sua família, lhes absorva toda a força de trabalho, garantindo-lhes a subsistência e o progresso social e econômico, com área máxima fixada para cada região e tipo de exploração” (a rural property, directly and personally operated by a farmer and his family, who conduct all of the work, which provides their sustenance and social and economic well-being, using the maximum area allowed for that region and type of property.) The MST, interested in cultivating a culture of love for the
land within its membership and maintaining the image of desperate and committed would-be small farmers, also discouraged employment outside of the settlement (Wolford 2010:79).

97 This restriction creates an unfortunate problem for many women. Plots have just one legal title holder, between a couple most often the man. If a woman wishes to leave her husband she has no right to half of their property nor can the couple sell the plot and split the profit. Daughters, too, are unlikely to inherit land (Brumer 2008:24). The combination of legal and cultural restrictions contribute to pervasive rural gender inequality.

98 Vigier himself actually does live in the region.

99 Shortly after I arrived in the region in February 2010, there were a number of fires in the region. This always happens during the dry season, and IBAMA even hires extra crews of firefighters to address the issue. IBAMA was also very quick to suggest that the community of Autaz-Mirim was responsible for the fires. Davi’s supervisor at the AMLD seriously doubted that the acampados would use fires in the dry season, knowing how likely it was that they would hurt themselves with a fire gone out of control. She thought hunters or vagrants were more likely culprits, but in the late 1970s a settler did start a fire that caused significant damage to the reserve, and lead to the expulsion of the farmer from the community (Cullen, Alger and Rambaldi 2005:751). That mistake lives on, and “ignorant” farmers continue to be easy targets for blame when fires occur.

100 In both popular discourse and official censuses, Brazilian racial terminology can be quite colorful. Though less evocative than “coffee with milk,” “purple,” or “cinnamon,” morena is one of the more commonly used racial descriptors (Telles 2004:82).

101 There were some grumblings, both within the AMLD and from others outside the organization, that the AMLD tends to favor certain people over others and returns repeatedly to the same plots in Quete for agroforestry projects rather than trying to work with the rest of the community. I also noticed, both in 2008 and 2010, the same cast of farmers, including Ademir and Gerson, appeared and reappeared for AMLD projects.

102 Also, as noted earlier, non-profits in South America in general are mistrusted as corrupt and self-serving.

103 Neumann points out that the in addition to the root of the national park idea in “an Anglo-American nature aesthetic” and capitalist “landscapes of consumption for leisure and profit,” even the idea of “preservation” itself is flawed. “National parks are paradoxical,” according to Neumann, because “the culturally constructed aesthetic ideal of the natural landscape can never be ‘preserved’ because the dynamism of ecological professes defies preservation” (Neumann 1998:28).

104 At a strategic planning meeting of the AMLD in November 2010, the project team discussed the fact that, though agroforestry features in their overall strategy for the region, they did not currently have any data that showed definitively that agroforestry corridors are used by animals to effectively link forest fragments (fieldnotes, November 2, 2010). Recent research from the Atlantic Forest in Bahia indicates that agroforests are used by maned sloths, Bradypus torquatus, as major parts of their home range (Cassano et al. 2011). Maned, also called three-toed, sloths are also found alongside golden lion tamarins in the southeastern Brazilian Forest.

105 This line is from a bit on an old Woody Woodpecker cartoon; the show is curiously popular and ubiquitous on Brazilian television. Carol quoted it to me while we were at the conference; in the episode Woody (“Pica-Pau” in Portuguese) turns the king’s son into long haired minstrel-type with a guitar who strums away singing, “não vou trabalhar, eu sou hippie e não vou trabalhar”
I’m a hippie so I’m not going to work.] I was not the only one who found our university hosts oddly out of step with the farmers we had come with. Community meetings are a hallmark feature of MST settlements, in fact, “active participation in an MST cooperative requires attendance at an almost constant round of meetings and mobilizations” (Wolford 2010:107).

The team that I spent my time with worked exclusively with the tamarins reintroduced on private property. A second AMLD team managed the tamarin families on the União and Poço das Antas reserves. However, since permits are required to enter the biological preserves I did not join the second team. I was not too sorry since I was told that they generally got started well before dawn.

Not only the tamarins on private lands are faced with space constraints. In a comparison of ranges of the four lion tamarin species on a seven different biological preserves, the GLTs on Poço das Antas had the second smallest home range, due in large measure to the high population density on the reserve (Kierulff 2002a:180).

Over the years, zoos have debated naming animals to encourage rapport with visitors or not naming them to avoid anthropomorphizing wild animals. In a recent novel about the tamarin reintroductions of the early 1980s by one of the project’s leading scientists (Beck 2013), the fictionalized scientists reproduce this debate, ultimately deciding that the pain of losing animals to the elements is deepened when they knew the animals by names rather than numbers.

Provisioning primates (offering food) as a method of inuring the research subject to the presence of the researcher was a common practice, (see Haraway 1989). However, provisioning does have some safety risks for the animals involved, and some primatologists prefer habituation practices that do not involve food (Wilson 2003).

As noted in chapter 3, post-release support of newly reintroduced tamarin families is critical to their success in the wild. However, in time tamarins become independent and wild-born offspring of reintroduced parents had higher rates of survival than captive-born individuals (Kierulff et al. 2002b:277).

The golden lion tamarins on the Poço das Antas reserve in particular are “the most thoroughly studied of any wild callitrichid population” (Baker et al. 2002:190).

When I returned to Brazil in 2010, a researcher from the Smithsonian Zoo was in town for the primary purpose of sitting with Diana and getting her memories of these animals out of her head and onto paper.

Male tamarins are far more likely to immigrate into groups as both male and female resident tamarins typically respond aggressively to female would-be immigrants (Baker et al. 2002:195). Though some tamarins do live outside the group structure, as individuals or as part of a duo (more common for males), these loners are not likely to reproduce (Baker et al. 2002:190).

Henry et al. (2013) noted that 83% of tamarin groups experienced “pregnancy polygyny,” or more than one pregnant female in the group. Most infants born to subordinate females did not, likely due to abandonment (Henry et al. 2013:675).

Not only does most research focus on the tamarin, in my observation (both of activities in the field and in my encounters with the academic literature) most of the studies take place in the biological reserves (Poço das Antas or União), as opposed to the private lands surrounding them.

This insight was provided by Carlos Ruiz-Miranda, a professor at the Universidade Estadual do Norte Fluminense (State University of Northern Rio, UENF) who has worked with the AMLD for many years. I asked him specifically why no one was interested in studying the
preguiça-de-coleira (Maned sloth). He said that some students have been interested, but the incredible archive of mico research, versus the virtual absence of information about the sloth, is a compelling argument for sticking with the tamarin. The laboriously constructed infrastructure for ongoing research on the monkey facilitates the continuation of the primate studies. The tamarin data is not strictly limited to notes about the biology and physiology of the species but, as mentioned above, includes information about the condition of the forest and other human and non-human activities that impact the tamarins. Students with an interest in the ecology of the Atlantic Forest can more easily use the tamarin as their starting point than work on a new species.

There is an interest at the AMLD in making sure that the data does not stray too far away from the organization. Professor Ruiz-Miranda pointed out that an immense amount of data collection and analysis is being conducted by the AMLD and at the time I was in the field they were working on putting all of their historical data into a comprehensive database. However, once the database is ready, they are reluctant to make the information completely public. Not only is there the (unfortunately) ever-present threat of academic plagiarism, the AMDL team does not want to allow major research projects on the tamarin that are completely disconnected from the work in Brazil (fieldnotes, March 22, 2010). With access to decades of data, a researcher could easily publish prolifically and cultivate a reputation as a tamarin expert without having any relationship to the project in Brazil that made it all possible. Reminiscent of how James Scott describes bureaucratic forest management, in which “the forest itself would not even have to be seen; it could be ‘read’ accurately from the tables and maps in the forester’s office” (Scott 1999:15), tamarins could be read and researched from a clinical distance. The AMLD is not excited about this possibility.

Conservation’s relationship to development and to the state is by no means a thing of the past. In her discussion of Indonesian conservation in the 1990s, Celia Lowe discusses “how the main actors in the Togean conservation project (Indonesian biologists and Togean people) constituted and were constituted through projects of nature-making, and how the nation was critical to both the particularity of the Togean biodiversity project itself” (Lowe 2006:6). Local people might also be transformed into more “productive” citizens through development projects that seamlessly integrate themselves into conservation and ecotourism work (Carruyo 2008).

Not only did I want adopt a cool nonchalance about my proximity to this amazing animal so as not to seem too much like a tourist, I could not help wondering “whom and what do I touch when [if] I touch my [dog tamarin]?” (Haraway 2008:3).

In this case, scientists appreciate the biological qualities of the animal without the cultural prejudice that can be writ onto animals. Hyenas are erroneously viewed as primarily scavengers and thus less noble than hunting animals. Additionally, in spotted hyenas, the female has an elongated clitoris that makes males and females visually virtually indistinguishable from one another. This led to the supposition that hyenas were hermaphrodites, another quality that earned them disrepute (Glickman 1995).

Many of the AMLD employees, not only field teams, frequently sported tamarin branded hats and shirts outside of working hours. This could be evidence of their dedication and identification with their work, or equally a working class appreciation for well-made goods. The AMLD’s branded vehicles also go home with employees. I went to Silva Jardim once looking for Diana but without the faintest clue where she lived. I arrived in the center of town, asked a few people about a woman who drove a car with a monkey on the side and was directed to her house very
quickly. Again, the employees very likely drive the tamarin cars because most working class Brazilians do not own their own vehicles. But that does not negate the fact that within their town and among their friends they are associated with the animal, and they identify themselves with the animal as well.

Similarly, sport fishermen, who are often of the same socio-economic class as the sport hunters discussed in chapter 1 as proto-conservationists, are comfortable with lakes stocked with non-native fish (Lien 2005:664) just as hunters may accept game preserves with stocked, and potentially exotic, game.

One of the first and most important objects in the duck campaign was to keep the ruddy duck and the native white-headed duck away from one another, and opponents of the campaign suggested that perhaps the two species of ducks were not so different from one another (Milton 2000:235).

In a more expansive expression of what might qualify as a species, Haraway suggests that “many categories of beings, including technological assemblages and college students, count as ‘species’ enmeshed in the practice of learning how to be worldly” (Haraway 2008:281).

Milton suggests that strict species definition might not be the crux of conservation efforts as “biodiversity is recognized as existing within, as well as between species” and thus “diverse populations of the same species still constitute biodiversity” (Milton 2000:236). However, as the examples of wolves in the following paragraph suggest, while conservationists may value discrete groups of a single species, the politics of protecting two pools of the same animal are challenging.
Appendix A, Acronyms and terms

**Acronyms**

AMLĐ  Associação Mico-Leão-Dourado (Golden Lion Tamarin Association)
BNDES  Banco Nacional de Desenvolvimento Econômico e Social (Brazilian National Development Bank)
CEDRO  Not actually an acronym, but the name of an agricultural assistance NGO
CPRJ  Centro de Primatologia do Rio de Janeiro (Primatology Center of Rio de Janeiro)
GHLT  Golden-headed lion tamarin
GLT  Golden lion tamarin
IBAMA  Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute for the Environment and Natural Renewable Resources)
INCRA  Instituto Nacional de Colonização e Reforma Agrária (National Institute for Colonization and Agrarian Reform,)
MST  Movimento Sem Terra (Landless Workers Movement)
RPPN  Reservas Particulares de Patrimônio Natural (Private Natural Heritage Reserves)
SAF  sistema agroflorestal (agroforestry system)
UFFRJ  Universidade Federal Rural do Rio de Janeiro
WWF-Brasil  World Wide Fund for Nature-Brazil

**Terms**

`assentamento`  legally sanctioned agrarian reform community
`baixada litorânea`  lowland coastal region
`fazenda`  plantation
`mutirão`  community get together to perform a collective task
`mico`  little monkey
`sítio`  farm
Appendix B, The banana letter

Text of the letter found in the AMLD files.

Senhor Responsável pela Reserva

Acabamos de ser informados que micos leão da reserva atacaram bananal em nossa propriedade. Somos agricultores e estamos formando mudas de banana prata para um grande bananal na nossa divisa miura/combi.

Na semana passada 28 pés foram invadidos pelos mico-leão, 18 pes estão identificados e ainda em pé, 28 estão cortados, no local.

Tal fato não pode ocorrer, pois trata-se da invasão de propriedade particular, com todos os direitos resguardados na constituição e a reserva tem área delimitada por legislação específica, para não ocasionar problemas com as propriedades vizinhas.

Somente podemos creditar a invasão ocorrida, como um problema de ração para os animais, que passaram a procurar alimentação.

Nossa prejuízo está estimado na perda de 150kg de banana prata equivalente a CZ$11.200,00 para o qual pedimos ressarcimento, esperando providencias para evitar um prejuízo maior a nossa produção ou qualquer novo ataque dos mico-leão ao bananal.

Dentro do respeito mutuo que deve existir entre propriedades rurais que apenas simples cercas de arame farpado delimitam seus espaços, e animais como mico-leão não sabem identificar e respeitar, cabendo assim que as equips tecnias a responsabilidade pela manutenção e respeito, dentro das normas deveres e direitos dos cidadãos.

O Sr Waldyr poderá mostrar aos responsáveis o local onde os micos-leão estiveram, para os acertos necessaries, pelos telephones abaixo. Aguardamos as informações tomadas para evitar a repetição do ocorrido.

Estamos ainda encaminhando cópia da presente ao IBDF para garantia de nossos direitos constitucionais.

Cordiais saudações.

Iguape, SJ, 10 de outubro de 1988
Sitio São Sebastião (BR101 km 222 – Estrada de Paperora)
Joédir Amerim de Sá
Bibliography

Academia Brasileira de Letras  
2013. Casimiro de Abreu.  

Amado, Jorge  

Articulação Nacional de Agroecologia (ANA)  

Associação Mico-Leão-Dourado (AMLD)  


Ashworth, Gregory  

Auyero, Javier and Debora Alejandra Swistun  

Ballou, Jonathan D., Devra G. Kleiman, Jeremy J.C. Mallinson, Anthony B. Rylands, Cláudio B. Valladares-Padua, and Kristin Leus  

Baker, Andrew J., Karen Bales, and James M. Dietz  

Banerjee, Onil, Alexander J. Macpherson, and Janaki Alavalapati  

Beck, Benjamin  

Beck, Benjamin B., Maria Inês Castro, Tara S. Stoinski, and Jonathan D. Ballou  

2008 Are Biological Species and Higher-Ranking Categories Real? Fish Folk Taxonomy on Brazil’s Atlantic Forest Coast and in the Amazon. Current Anthropology 49 (2):291–306.

Bekoff, Marc
2004 Wild justice and fair play: cooperation, forgiveness, and morality in animals. Biology and Philosophy 19:489–520.
Benjamin, Antonio Herman V.
Berger, John
Bobrow-Strain, Aaron
Borofsky, Robert
Brannstrom, Christian
Braun, Bruce
Brito, Daniel, Leonardo C. Oliveira, and Marco Aurélio R. Mello
Brockway, Lucille
Brooke, James
Brown, Emma
Brumer, Anita
Calaraco, Matthew
Calgano, James

175

Cussins, Charis M. Thompson

da Cunha, Euclides

Dean, Warren

Denevan, William M.

Dietz, James, Louann Dietz, and Elizabeth Nagagata

Dietz, Louann

Dolhinow, Phyllis

Duarte, Regina

Emel, Jody, and Jennifer Wolch

Ereshefsky, Marc

Estações Ferrovias

Feeley-Harnick, Gillian

Fernandes-Ferreira, Hugo, Sanjay Veiga Mendonça, Ciro Albano, Felipe Silva Ferreira, and Rômulo Romeu NóBrega Alves

Franklin, Sarah


French, Jeffrey A., Kristel de Vleeshouwer, Karen Bales, and Michael Hestermann

Fuentes, Agustín

Fuentes, Agustín, and Linda Wolf, eds.

Fundação Anita Mantuano de Artes do Estado do Rio de Janeiro (FUNARJ)

Gibson, Clark C., and Stuart A. Marks

Glickman, Stephen E.

Goedeke, T.L. and S. Rikoon

Groves, Colin
2001  Why Taxonomic Stability is a Bad Idea, or Why Are There so Few Species of Primates (Or Are There?). Evolutionary Anthropology 10:192–198.

Hall, Richard J., J. Milner-Gulland, and F. Couchamp

Haraway, Donna
2008  When Species Meet. Minneapolis: University of Minnesota Press.
Harvey, David
Heatherington, Tracey
Hecht, Susanna and Alexander Cockburn
Heller, Chaia, and Arturo Escobar
Helmreich, Stefan
Henry, MaLinda D., Sarah J. Hankerston, Jennifer M. Siani, Jeffrey A. French, and James M. Dietz
2013  High rates of pregnancy loss by subordinates leads to high reproductive skew in wild golden lion tamarins (Leontopithecus rosalia). Hormones and Behavior 63:675–683.
Hinojosa, Flavio Coello
Hinrichsen, Don
Hochstetler, Kathryn, and Margaret E. Keck
Holston, James
Hull, Matthew S.
Ingold, Tim

Instituto Brasileiro de Geografia e Estatística (IBGE)  

Instituto Chico Mendes de Conservação da Biodiversidade (ICMBio)  

Instituto Nacional de Colonização e Reforma Agrária (INCRA)  
2012 Projetos de Reforma Ágrária Conforme Fases de Implementação. Ministério do Desenvolvimento Agrário, Diretoria de Obtenção de Terras e implantação de Projetos de Assentamento.

Instituto Pri-Matas para a Conservação da Biodiversidade  

Intergovernmental Oceanographic Commission of UNESCO (IOC/UNESCO)  

International Union for Conservation of Nature (IUCN)  

Jacoby, Karl  

Kalof, Linda, and Amy Fitzgerald  

Kierulff, Maria Cecília Martins  


Kierulff, Maria Cecília M., Becky E. Raboy, Paula Procópio de Oliveira, Kimran Miller, Fernando C. Passos, and Fabiana Prado  

Kierulff, Maria Cecília M., Paula Procópio de Oliveira, Benjamin B. Beck, and Andréia Martins  

Kirksey, S. Eben and Stefan Helmreich
Kleiman, Devra
Kleiman, Devra, and James Mallinson
Kleiman, Devra, and Anthony Rylands, eds.
Knight, John
Kolb, Susan Rose
Kohn, Eduardo
Kosek, Jake
Landim, Leilah
Latour, Bruno
Latour, Bruno, and Steve Woolgar
Lawson, Helene M.
Levi-Strauss, Claude
Lien, Marianne E.
Limbert, Mandana
Linhares, Arnaldo
Lorimer, Jamie
Loudon, James E., Michaela E. Howells, and Agustín Fuentes

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

Lowe, Celia

Marks, Stuart A.

Martin, Emily
1997 Medical Metaphors of Women’s Bodies: Menstruation and Menopause. In Writing on the
Body: Female Embodiment and Feminist Theory. Katie Conboy, Nadia Medina, and Sarah


Martini, Augusto Jeronimo
2004 O Plantador de Eucaliptos: A Questão da Preservação Florestal no Brasil e o Resgate
Documental do legado de Edmundo Navarro de Andrade. M.A. thesis, Department of
History, University of São Paulo.

Mathews, Andrew S.
Press.

Mattos de Castro, Hebe Maria
1988 Beyond Masters and Slaves: Subsistence Agriculture as a Survival Strategy in Brazil
during the Second Half of the Nineteenth Century. The Hispanic American Historical

McKinney, Tracey
2011 The Effects of Provisioning and Crop-Raiding on the Diet and Foraging Activities of
Human-Commensal White-Faced Capuchins (Cebus capucinus). American Journal of

Milton, Kay
2000 Ducks out of water: nature conservation as boundary maintenance. In Natural Enemies:
London: Routledge.

Ministério do Desenvolvimento Agrário (MDA)
2006 Agricultura Familiar no Brasil e o Censo Agropecuário. Brasília: Ministério do
Desenvolvimento Agrário.

Mitman, Gregg
Osiris 11:117–143.

Mittermeier, Russell A., Adelmar F. Coimbra-Filho, Isabel D. Constable, Anthony B. Rylands,
and Celio Valle


Orlove, Benjamin S., and Stephen B. Brush
Pandian, Anand
Perry, Susan E.
Pessamílio, Dionício
Pratt, Mary Louise
Queensland Department of Main Roads
Raffles, Hugh
Rambaldi, Denise Marçal, Devra G. Kleiman, Jeremy J.C. Mallinson, Lou Ann Dietz, and Suzana M. Padua
Ramos, Doracy Pessoa, Celso Vainer Manzatto, Helga Restum Hissa Manzatto, and Edgar Shinzato
Reis, Ademir, Renata Martinho Zambonin, and Erika Matsuno Nakazono
Ribeiro, Milton Cezar, Jean Paul Metzger, Alexandre Camargo Martensen, Flávio Jorge Ponzoni, and Márcia Makiko Hirota
2009 The Brazilian Atlantic Forest: How much is left, and how is the remaining forest distributed? Implications for conservation. Biological Conservation 142:1141–1153.
Riles, Annelise
Riley, Erin
Ritvo, Harriet
Rodrigues, Ricardo R., Renato A.F. Lima, Sérgius Gandolfi, André G. Nave
Rogers, Thomas D.
Ruiz-Miranda, Carlos Ramon, Adriana Gomes Affonso, Marcio Marcelo de Morais, Carlos Eduardo Verona, Andreia Martins, and Benjamin B. Beck
2006 Behavioral and ecological interactions between reintroduced golden lion tamarins (Leontopithecus rosalia Linnaeus, 1766) and introduced marmosets (Callithrix spp, Linnaeus, 1758) in Brazil's Atlantic Coast forest fragments. Brazilian Archives of Biology and Technology 49(1):99–109.
Russell-Wood, A.J.R
Rylands, Anthony B.
Rylands, Anthony B., Maria Cecília M. Kierulff, and Luiz Paulo de Souza Pinto
Rylands, Anthony B., Jeremy J.C. Mallinson, Devra G. Kleiman, Adelmar F. Coimbra-Filho, Russell A. Mittermeier, Ibsen De Gusmão Câmara, Cláudio B. Valladares-Padua, and Maria Iolita Bampi
Sapolksy, Robert M.
Save the Lion Tamarins
Schiebinger, Londa
Scott, James
Seuánez, Héctor N., Anthony Di Fiore, Miguel Ângelo M. Moreira, Carlos Alberto Da S. Almeida, and Flávio C. Canavez

Shir-Vertesh, Dafna

Simberloff, Daniel

Simmons, Cynthia S., Robert T. Walker, Eugenio Y. Arima, Stephen P. Aldrich, and Marcellus M. Caldas

Slater, Candance

Small, Christopher, and Robert J. Nicholls

Sodikoff, Genese


Sponsel, Leslie E

Stape, Jose Luis

Steffen, Priscila Geha

Stein, Stanley J.

Stepan, Nancy Leys

Strier, Karen


Tambiah, S.J.
1969 Animals are Good to Think and Good to Prohibit. Ethnology 8(4):423–459.
Telles, Edward E.
Temperton, Vicky M.
Trouillot, Michel
Tsing, Anna Lowenhaupt
Tuan, Yi-Fu
Vaz de Caminha, Pêro
Viotti da Costa, Emilia
Visite Casimiro de Abreu
Vivanco, Luis
Viveiros de Castro, Eduardo
Walley, Christine
Warren, Louis S.
1997 The Hunter’s Game. New Haven, CT: Yale University Press.
West, Paige
West, Paige, James Igoe, and Dan Brockington
Wilson, Alexander
Wilson, Edward O.
Wilson, Mike
accessed June 7, 2013.
Wolford, Wendy
2010 This Land is Ours Now: Social Mobilization and the Meanings of Land in Brazil.
Wright, Angus Lindsay, and Wendy Wolford
2003 To Inherit the Earth: The Landless Movement and the Struggle for a New Brazil. Food
First.
Zimmer, Carl
2013 Despite Two New Studies on Motives for Monogamy, the Debate Continues. New York
Times, July 30: A14.